UNISON COMMUNITY WATER AND WASTEWATER STUDY

Feasibility Study

DECEMBER 16, 2022

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TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

ABBREVIATIONS

AOSS	Alternative Onsite Sewage System
AR-2	Agricultural Rural-2
BOS	Board of Supervisors
CAPP	Certificate of Appropriateness
CMPT	Commission Permit
CTC	Certificate to Construct
CTO	Certificate to Operate
Dewberry	Dewberry Engineers, Inc.
DIP	Ductile Iron Pipe
EDM	Engineering Design Manual
EGGI	Emery & Garrett Groundwater Investigations
FEMA	Federal Emergency Management Agency
FSM	Facility Standards Manual
GIS	Geographic Information System
gpd	Gallons per day
gpm	Gallons per minute
2019 GP	Loudoun County 2019 General Plan
HDRC	Historic District Review Committee
HR	Historic Roadways
IPaC	Information for Planning and Consultation
LCCO	Loudoun County Codified Ordinance
LCHD	Loudoun County Health Department
LC ZO	Revised 1993 Loudoun County Zoning Ordinance
LF	Linear Feet
LOMR	Letter of Map Revision
LW	Loudoun Water
Marsh & Legge	Marsh & Legge Land Surveyor, P.L.C.
MSL	Mean Sea Level
MBR	Membrane bioreactor
NEPA	National Environmental Policy Act

NHPA	National Historic Preservation Act
ODW	Office of Drinking Water
RME	Responsible Management Entity
ROW	Right of way
RPA	Rural Policy Area
SCAT	Sewage Collection and Treatment Regulations
SHDR	Sewage Handling and Disposal Regulations
SHPO	State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plan
TL-2	Treatment level 2
TL-3	Treatment level 3
TM	Technical Memorandum
The Program	Community Water and Wastewater Program
Unison	Village of Unison
USACE	United States Army Corps of Engineers
VA DEQ	Virginia Department of Environmental Quality
VA DCR	Virginia Department of Conservation Resources
VA DWR	Virginia Department of Wildlife Resources
VCOD	Village Conservation Overlay District
VCRIS	Virginia Cultural Resource Information System
VDH	Virginia Department of Health
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation
VMP	Virginia Water Protection
VMRC	Virginia Marine Resources Commission
VLR	Virginia Landmarks Register
VSMP	Virginia Stormwater Management Program
WOUS	Waters of the U.S.
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

The Village of Unison (Unison) is located in a historic district in Loudoun County, Virginia. Unison is a Virginia Historic Landmark (ID#053-0692) and is listed on the National Register of Historic Places (ID#3000442). The community water is provided via individual private wells, and wastewater is managed by the use of individual septic systems, pump and haul, pit privy or alternative dispersal/pre-treatment. In 2020, Unison submitted an application for the Community Water and Wastewater Program (The Program) for assistance for both their water and wastewater needs. This application was accepted, and as a result, Dewberry Engineers Inc. (Dewberry), under agreement with Loudoun Water (LW), was tasked with developing an engineering feasibility study. A map of Unison, which shows the study boundary, is included as **Figure 1-1**. There are 34 total parcels within the study boundary, including two (2) vacant parcels.

The purpose of this feasibility study is to evaluate the concerns of the community and to determine the technical feasibility of potential solutions to the community's water and wastewater needs. This feasibility study reviews the existing conditions of the community, presents the estimated existing and future water demands of the community, provides an analysis of the existing water supply systems and provides an evaluation of the following options to improve the water and wastewater conditions within the Village of Unison:

Water:

1. Upgrade Existing On-Site Systems
2. Communal Water Treatment Facility (Using New Community Well)
3. Wholesale Purchase of Water from, or Connection to, a Nearby Municipal System

Wastewater:

1. Upgrade Existing On-Site Systems
2. Subsurface Discharging Wastewater Treatment Facility
3. Surface Water Discharging Wastewater Treatment Facility (with Potential Discharge into Beaverdam Creek)
4. Conveyance and Pump Station Connection to the St. Louis Community System

Prior to analyzing the feasibility of these alternatives, a comprehensive analysis was performed to better understand the community characteristics such as topography, existing utilities, permitting and policy considerations, and regulatory requirements. As part of this review, Dewberry completed a preliminary environmental screening inventory, which is included as **Appendix A**. It should be noted that the exact permitting and regulatory requirements for a particular alternative will not be able to be fully evaluated until a specific alternative is selected, or advanced with sufficient detail, and submitted to regulatory agencies for review. Based on the historic nature of the community, the permitting and approval process may be a significant effort, however no limitations were identified that would deem construction of a water and wastewater system infeasible at this time. Subsequent phases of this project may include further field investigations, which could drive permitting and approvals that ultimately become a critical path for the project, such as the need for archeological surveys or other, more detailed investigations.

Before assessing the feasibility of the various water and wastewater system alternatives, a preliminary existing system analysis was conducted, which reviewed the Unison Application (included as **Appendix B**), health department records (research included as **Appendix C**) and the results of a survey sent to the 32 properties in Unison (included as **Appendix D**). Based on this analysis, there was sufficient evidence that members of the community of Unison have faced water problems (quality and quantity) and wastewater problems (failures and odor) in the past. Furthermore, some of these issues seem to persist throughout the community.

The Phase 1 Groundwater Hydrology Report prepared by Emery & Garrett Groundwater Investigations (EGGI), which is included as **Appendix E**, was also included as a part of the project analysis. The report identified three (3) potential Groundwater Development Zones, which are shown in **Figure 3-2** and identified as UNI-1, UNI-2, and UNI-3, where UNI-1 is considered more hydro-geologically favorable for groundwater development than UNI-3. According to EGGI, these Zones are considered the best candidate areas for developing potable groundwater resources for a community water system in Unison.

A flow analysis technical memorandum (TM), which describes the process used to estimate current and potential future water demands and sewage flows within the Unison community, was developed and is included as **Appendix F**. Based on the TM, the recommended demand (for the study area) to be used for sizing of a community water distribution piping and well/treatment systems (as needed) for the Unison community is 61 gallons per minute (gpm). The recommended flow (for the study area) to be used for sizing of a community sewage distribution piping, drainfield areas and treatment systems (as needed) for the Unison community is 21 gpm.

Following the flow analysis TM, a soil analysis TM was developed, which discusses results of the soil investigations conducted by Dewberry and Marsh & Legge Land Surveyor, P.L.C. (Marsh & Legge) and is included as **Appendix G**. The analysis revealed that the total land area required for a community drainfield system is approximately 19 to 21 acres, based on two (2) different treatment levels. This includes a drainfield area of 3 to 4 acres (and a reserve drainfield area of the same size), a dilution area of 12.5 acres and a WWTP area of 0.5 acres.

All three (3) alternatives for water and all four (4) alternatives for wastewater were then evaluated to determine technical feasibility. The result of the evaluation determined that all wastewater alternatives are technically feasible and that one (1) of the wastewater alternatives is infeasible. In summary:

Water:

1. <u>Upgrade Existing On-Site Systems</u>

   Technically feasible alternative that may improve individual systems. May require hydrofracking on individual wells to improve yield. Long term sustainability of this solution cannot be determined. Not considered a viable alternative due to uncertainty with water yield and existing conditions within the community.

2. <u>Communal Water Treatment Facility (Using New Community Well)</u>

   Technically feasible alternative requiring new communal well system and treatment facility as well as water distribution system. Wells and treatment facility could be located in or around the existing Unison community, pending further groundwater investigations and required studies.

3. Wholesale Purchase of Water from, or Connection to, a Nearby Municipal System

   One (1) municipal system (Town of Middleburg) exists approximately six (6) miles away from the community. Though considered technically feasible, this alternative is the most costly of all the water alternatives. If a new community water system was to be developed in a nearby town or community, there is potential that Unison could connect to this system, creating a community-to-community system. This alternative would require future evaluation should it become available.

Wastewater:

1. Upgrade Existing On-Site Systems

   Infeasible alternative due to the limited available area surrounding the existing systems and the presence of one (1) pump and haul, as pump and haul operations are permitted in the RPA only as a last resort and a temporary method to address a proven public health emergency.

2. Subsurface Discharging Wastewater Treatment Facility (Communal Drainfield)

   Technically feasible requiring new communal wastewater distribution and treatment before discharge to a drainfield.

3. Surface Water Discharging Wastewater Treatment Facility (with Potential Discharge into Beaverdam Creek)

   Technically feasible requiring new communal wastewater distribution and treatment before discharge to Beaverdam Creek. This alternative includes purchase of nutrient credits to meet discharge requirements.

4. Conveyance and Pump Station Connection to the St. Louis Community System

   Technically feasible alternative involving connection to the existing St. Louis sewer system, either directly into the wastewater treatment plant (WWTP) or by tie-in to the gravity sewer. The conveyance distance from Unison to St. Louis is approximately 2.4 to 3.4 miles, and construction of a pump station would be required, as well as potential upgrades to the existing St. Louis sewer system. Though considered technically feasible, this alternative is the most costly of all the wastewater alternatives.

A criteria analysis was developed using six (6) criteria: constructability, public impacts, costs, approval/acceptance, environmental impacts, operations & maintenance. Each criterion was used to score the water alternatives on a scale from one (1) to five (5), with 5 being the more favorable scoring. As a result of this analysis, shown in **Table 3-4**, the recommended alternative for the water system is Alternative #2 (community water system). This alternative includes the implementation of a water distribution and treatment system. Two (2) potential well sites, as shown in **Figure 3-4**, have been identified that may provide adequate yield to convey the estimated future demand of 61 gpm to Unison. Per the preliminary layout shown in **Figure 3-4**, approximately 13,690 LF of 6-inch ductile iron pipe (DIP) is recommended to convey the water. Greensand filtration is the recommended treatment system due to the presumed presence of iron in the water. For the purposes of this feasibility study, it is also assumed that there will be one (1) treatment system for all wells.

The preliminary cost of this alternative, which includes the design/permitting/surveying for the project, construction of the water distribution system and the water treatment system (assuming one greensand filtration treatment system), property restoration, road restoration (for saw cutting) and easement acquisition, is approximately $5.2 million (with a low range of $4.1 million and high range of $6.7 million).

Additional costs associated with this alternative include annual O&M costs, which are approximately $112,000 (with a low range of $90,000 and high range of $146,000). Finally, a present worth analysis reveals the net present cost of this alternative to be approximately $6.7 million.

Similar to the evaluation of the water alternatives, a criteria analysis was used to evaluate the wastewater alternatives. As a result of this analysis, the recommended alternative for the wastewater system is Alternative #2 (community wastewater system). This alternative includes the implementation of a communal sewage collection and treatment system, which disperses into a drainfield. Three (3) potential drainfield sites were identified in the soil analysis, as shown in **Figure 4-2**. The recommended conceptual layout is either the combination system (gravity and low-pressure) or low-pressure system that conveys to the Southeast location, as shown in **Figure 4-3** and **Figure 4-4**. Per the preliminary layout shown in **Figure 4-3**, approximately 4,430 LF of 8-inch gravity sewer pipe and 1,710 LF of low-pressure pipe, as well as approximately 15 manholes, are recommended to convey the sewage. For the purposes of this study, cost estimates were developed for combination system since it will be more expensive. In order to provide a conservative cost estimate, a membrane bioreactor (MBR) is recommended. One of the main advantages of an MBR is its ability to meet low total nitrogen effluent limits, which would minimize the land area required for the nitrogen dilution area.

The preliminary cost of the combination system alternative, which includes the design/permitting/surveying for the project, construction of the wastewater collection and treatment system, individual parcel improvements, road restoration/site work and easement acquisition, is approximately $7.7 million (with a low range of $6.1 million and high range of $9.9 million). Additional costs associated with this alternative include annual O&M costs, which are approximately $202,000 (with a low range of $160,000 and high range of $263,000). A present worth analysis, which accounts for a 30-year life cycle with a 3% interest, reveals the net present cost of this alternative to be approximately $10.6 million. It should be noted that total capital cost of the low-pressure conveyance system alternative is approximately $1.6 million less than (or approximately 22% less than) the combination conveyance system.

The total capital cost for implementing both recommended alternatives is approximately $12.8 million, and the overall cost including soft costs (i.e., engineering, legal, survey, permitting, etc.) and land/easement acquisition is approximately $14.1 million.

1.0 PROJECT BACKGROUND

1.1 Unison Overview

The Village of Unison (Unison) is located in a historic district of Loudoun County, Virginia. Unison was placed on the Virginia Landmarks Register (ID#053-0692) in 2002 as the Unison Historic District and is recognized as a National Historic District (ID#3000442) on the National Register of Historic Places. The community consists of a total of 34 land parcels, including two (2) vacant parcels. The community water is provided via individual private wells, and wastewater is managed by the use of individual septic systems, pump and haul, pit privy or alternative dispersal/pre-treatment. In 2020, Unison submitted an application for the Community Water and Wastewater Program (The Program) for assistance with both their water and wastewater needs within the study boundary shown in **Figure 1-1**. This application was accepted due to the reported issues.

Dewberry Engineers Inc. (Dewberry) is under agreement with Loudoun Water (LW) to develop an engineering feasibility study for The Program in order to evaluate the concerns of the community and to determine the technical feasibility of potential solutions to the community's water and wastewater needs. The following options are being evaluated to help improve water and wastewater conditions within the Village of Unison:

Water:

1. Upgrade Existing On-Site Systems
2. Communal Water Treatment Facility (Using a New Community Well)
3. Wholesale Purchase of Water from a Nearby Municipal System

Wastewater:

1. Upgrade Existing On-Site Systems
2. Subsurface Discharging Wastewater Treatment Facility (Communal Drainfield)
3. Surface Water Discharging Wastewater Treatment Facility (with Potential Discharge into Beaverdam Creek)
4. Conveyance and Pump Station Connection to a Nearby St. Louis Community System

1.2 Feasibility Study Purpose

The purpose of this study is to determine the technical feasibility of the three (3) potential water solutions and four (4) potential wastewater solutions to Unison's water and wastewater issues. This feasibility study is divided into the following sections:

- Project Background
- Overall Community Evaluation
- Water System Evaluation
- Wastewater System Evaluation

- Overall Costs
- Summary & Recommendations

The information provided in this study may be utilized by the Unison Community as a basis for planning and design of a community water supply, treatment and distribution system and sanitary sewer collection, treatment and disposal system.

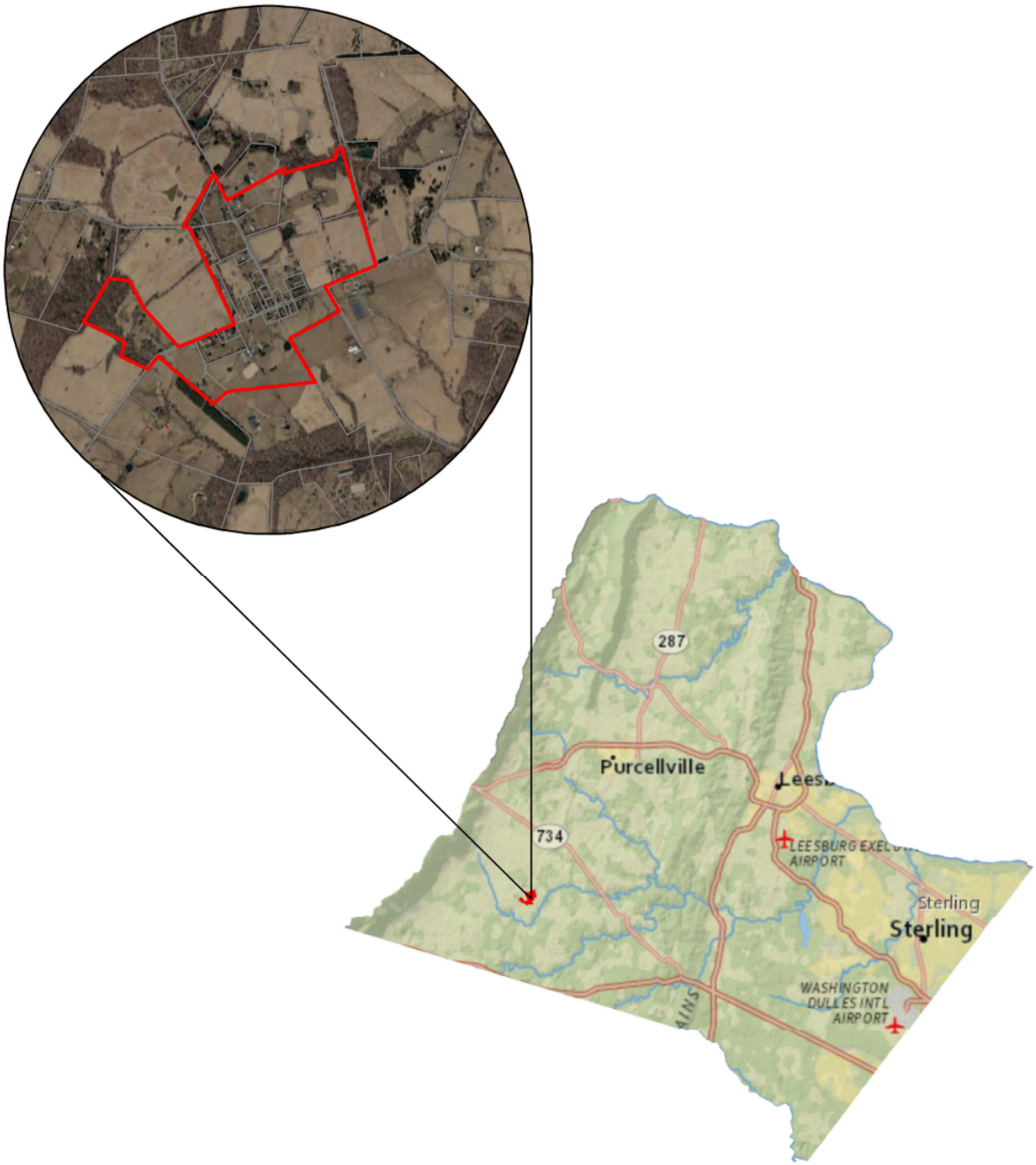

Figure 1-1 – Unison Location Map and Study Boundary

2.0 OVERALL COMMUNITY EVALUATION

2.1 Existing Characteristics

Unison is a small historic community consisting of 34 lots total within the study boundary. The lots within the study boundary range in size from approximately 0.29 acres to approximately 25 acres. Unison is located near the Beaverdam Creek and its tributaries, as shown in **Figure 2-1**.

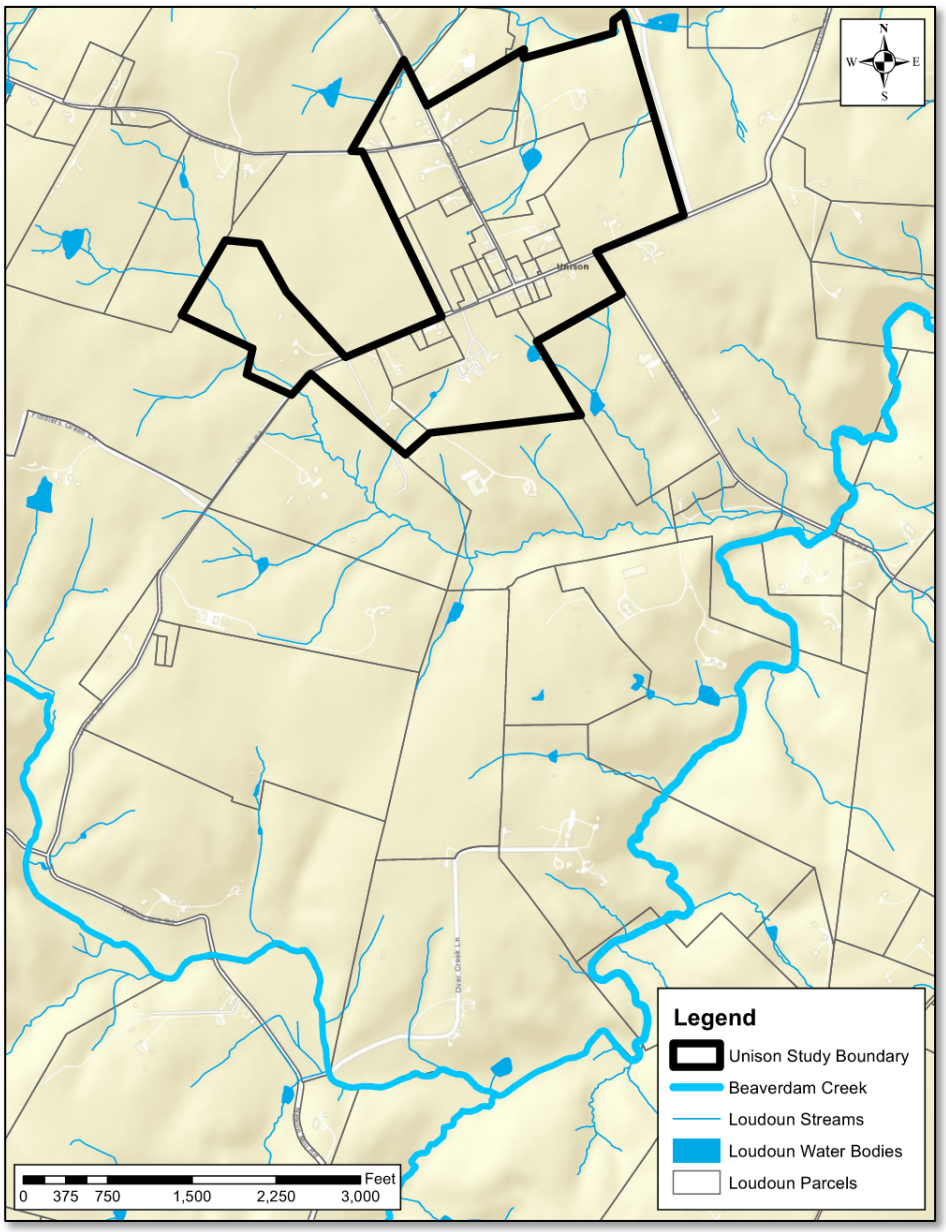

Figure 2-1 – Unison Village by Beaverdam Creek

2.2 General Topography

Unison has topography generally decreasing in elevation from the middle of the community moving both north and south throughout the community, as shown in **Figure 2-2**. A cluster of highpoints are located in residential parcels along Unison Rd in the center of the community and are approximately 480-feet above Mean Sea Level (MSL). The low points are located at stream tributaries at the southwestern corner of the community and at the northern end of the study boundary. The northern low point is approximately 420-feet above MSL and the southwestern low point is approximately 440-feet above MSL.

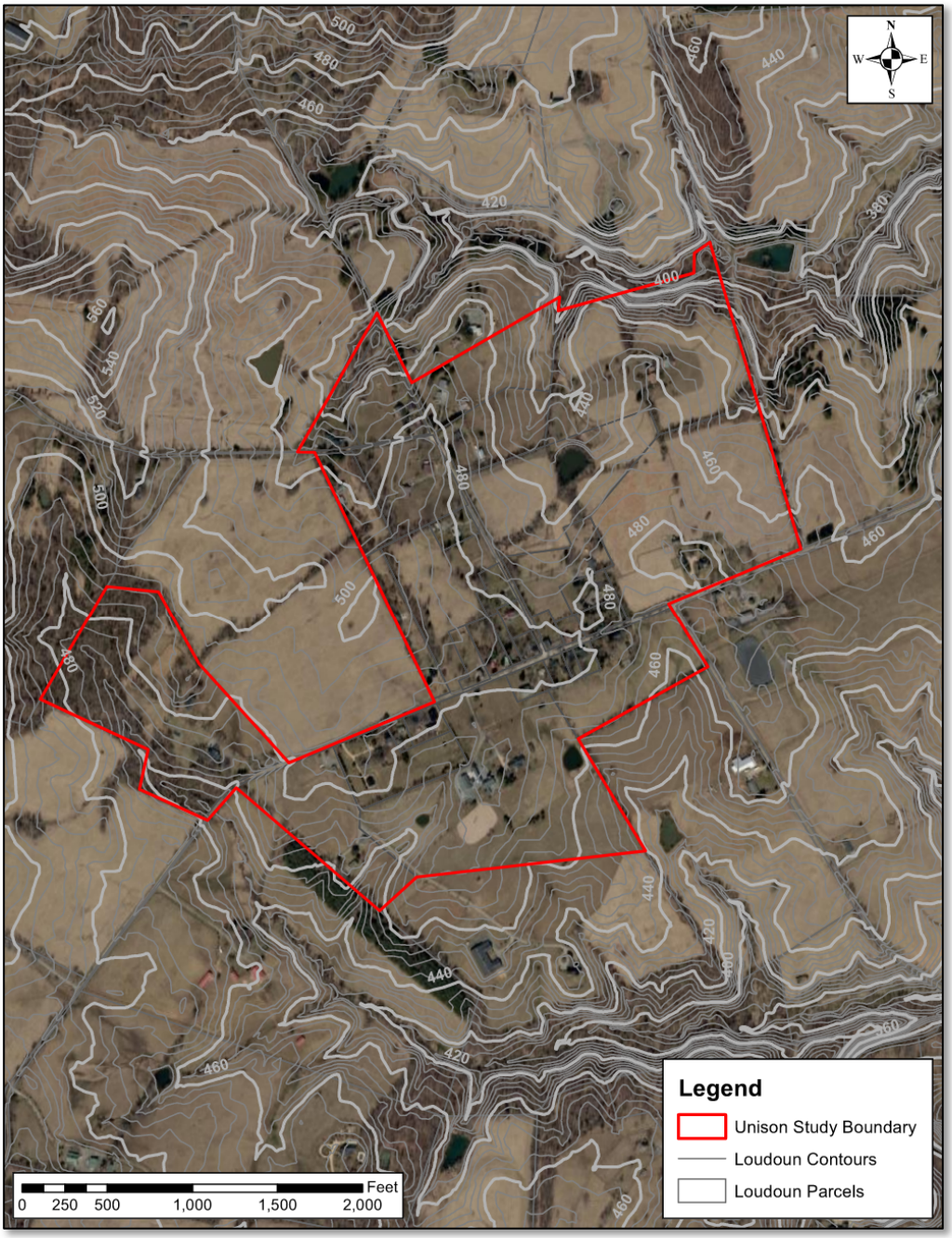

Figure 2-2 – Unison Topography

2.3 Existing Utilities

Dewberry contacted MISS Utility on April 4, 2022 to request a design ticket with field locates, in order to have existing underground utilities marked within the community. The response to the ticket (on April 22, 2022) indicated that the following two (2) utilities have underground utilities located within the community:

- Dominion Energy Electric
- Verizon Communications

Based on the two (2) site visits conducted on December 14, 2021, and April 26, 2022, the majority of electric facilities are located overhead and therefore were not marked. Markings showed that the communications utilities are generally located on the sides of the roads and occasionally cross the road.

2.4 Permitting and Policy Considerations & Regulatory Requirements

The following sections review potential permitting and policy considerations and regulatory requirements that may be encountered for the water and wastewater system alternatives. It should be noted that the exact permitting and regulatory requirements for a particular alternative will not be fully evaluated until a plan for that alternative is completed, or advanced with sufficient detail, and submitted to regulatory agencies for review. Based on the historic nature of the community, the permitting and approval process may be a significant effort, however no limitations were identified that would deem construction of a water and wastewater system infeasible at this stage of a study. Subsequent phases of this project may include further field investigations, which could drive permitting and approvals that ultimately become a critical path for the project, such as the need for archeological surveys or other detailed studies.

2.4.1 Water and Wastewater

There are several agencies that regulate water and wastewater systems in the Unison study area, which include Loudoun County, Loudoun Water, the Virginia Department of Health (VDH) Office of Drinking Water (ODW), the Loudoun County Health Department (LCHD), and the Virginia Department of Environmental Quality (VA DEQ). A summary of critical requirements from these agencies is as follows:

- Loudoun Water Engineering Design Manual (EDM)
- Loudoun County Facility Standards Manual (FSM)
- Chapter 1040, 1066 and 1067 of the Loudoun County Codified Ordinance (LCCO)
- Waterworks Regulations, developed by VDH (12VAC5-590)
- VA DEQ Sewage Collection and Treatment Regulations (SCAT) (9VAC25-790)
- Sewage Handling and Disposal Regulations (SHDR) , developed by VDH (12VAC5-610)
- Alternative Onsite Sewage Systems (AOSS), developed by VDH (12VAC5-613)

The sections below review relevant details from the above requirements.

2.4.1.1 Water

For improvements to existing private water wells, requirements would depend on the type of upgrade. If an existing well is replaced or deepened, a LCHD well permit would be required. Well tests are not required for irrigation wells, replacement wells, or for wells that have been drilled but not connected. However, if the upgrade requires the construction of a new well, then the LCHD regulates this process, and a well permit would need to be obtained from LCHD. Private well requirements are dictated by LCHD, LCC, and VDH OWD standards, while public well requirements are typically dictated by VDH ODW standards. Standard practice for applying regulations is that the most stringent requirement must be met in design and construction.

For the construction of a new well, most setback requirements are determined by LCHD. The LW Engineering Design Manual (EDM) includes well setback requirements for public utilities. And Chapter 1040 of the LCCO identify additional setback requirements for private utilities. Setbacks are evaluated on a case-by-case basis, and local codes may be waived in the case of an emergency, such as an out-of-water situation. **Table 2-1** lists several minimum well setback distances for private wells based on LCCO Chapter 1040, Appendix II, Table 1.

Table 2-1 – Minimum Well Setback Distances

STRUCTURE/TOPOGRAPHIC FEATURE	MINIMUM DISTANCE (FT)
Septic Tank	50
Drainfield	50-100
Cesspools, Pit Privies, etc.	150
Property Lines	10
Sewer (LW requirement)	50
Other sewer (LCHD)	35
Foundation of Buildings of Wood Framing or Exterior	50-100
Foundation of Buildings of Solid Masonry	15*
*Should any existing houses be identified as having received termite treatment; required setback from house foundation would be 50-feet.	

For public wells, VDH ODW requires a demand per connection of 3 gpm for private wells (individual and shared), assuming no storage. Public wells are subject to initial testing during construction to ensure water quality standards are met and subsequently routine testing takes place to verify water quality and treatment.

Per LCHD, minimum yield requirements of a new private well are one (1) gallon per minute (gpm) and the ability to produce 500 gallons within a two (2) hour period. If a well is not capable of meeting this yield, then the calculated difference between what the well can produce in two (2) hours and 500 gallons is required to be made up by adding a storage tank of that size. Storage tanks are only approved by LCHD with the addition of a new well. There are no additional requirements by LCHD to test a new well past its first test report.

For all other alternatives, any construction needed for structures, site access for the wells or treatment or distribution buildings will require a Loudoun County site plan approval, Loudoun County grading permit and Loudoun Water easements. The design and profiles for the water distribution network throughout Unison

will be submitted to Loudoun Water for review and approval. Depending on the disturbance area and work being performed, permits may be required through Loudoun County such as site plan, grading permit, and building permit. These would require Loudoun County review of the plans.

If a community water system were to be implemented, LCHD and VDH ODW would be involved in the location and construction of the community wells. These wells would be considered a public "Waterworks," which is defined by VDH ODW as "a system that serves piped water for human consumption to at least 15 service connections or 25 or more individuals for at least 60 days out of the year" (12VAC5-590-10).

Since the well would be considered a public Waterworks, VDH ODW would also be involved in regulation and testing of the well throughout construction and the life of the well. A Waterworks Permit Application for construction (construction permit) should be submitted through VDH ODW prior to construction of well(s) and distribution mains, unless a general permit for distribution mains is granted (12VAC5-590-300). All requests for a construction permit are directed initially to VDH ODW. Following completion of construction, a Waterworks Permit Application for operation (operation permit) should be submitted through VDH ODW. For the duration of the life of the well, VDH ODW requires that the well undergo annual monitoring (12VAC5-590-374, Table 374.1).

Additional requirements by LCHD for the construction of the wells depends on the class of the well. Well classes are also defined in Loudoun County Public Health Ordinances Chapter 1040 – Water Wells. LCHD defines two (2) classes of public wells: Class I and Class II. According to LCHD, Class I wells are "for public multi-user water supply systems," and Class II wells are "for public individual water supply systems and private water supply systems construction on lots three acres or less." Based on these definitions, a Class I public well would be required for this option. Water supply systems shall not be located in ground swale areas or flood plains which are subject to surface run-off and/or flooding. LCHD shall also approve a hydrogeologic study, which is required for groundwater sources.

LW operates and maintains public water and wastewater utilities for Loudoun County, which also includes community systems. Chapter 7 of the LW EDM also details requirements for "Community Water Systems." The Community Water System shall be approved by LW, and the procedure for reviews and approval by LW can be found in Appendix D of the EDM in the chart titled "Community Systems Design Review Process." Per the EDM, Loudoun Water will only consider for approval groundwater systems not influenced by surface water.

Loudoun Water also requires that systems serving 26 to 50 connections shall provide at least two (2) wells producing a combined total of 1.8 gpm per connection, the smallest of which must produce a minimum of 0.6 gpm per connection.

Furthermore, LW requires a minimum 100-feet radial or a 200-feet by 200-feet square for each well. A computerized hydraulic analysis of the distribution system shall be submitted to Loudoun Water for review and approval. Like with LCHD requirements, wells shall not be located within any major 100-year flood plain and shall be Class I.

If an existing private well were to be abandoned, an abandonment permit would need to be obtained from LCHD. A 25-feet setback distance from any part of a sewage disposal system or future systems is required for all wells properly abandoned. Additionally, well abandonment, both temporary and permanent, must

conform to 12VAC5-630-450. For temporary abandonment, wells must be sealed with a water-tight cap or well head seal. For permanent abandonment, the well must be plugged.

A water well completion report would not need to be submitted to the Virginia Department of Environmental Quality (VA DEQ) since Unison is not located in a Groundwater Management Area (GWMA).

If the Unison community connects to a nearby municipality, VDH ODW would regulate the actions taken since the Unison community would be connected to an existing, permitted public Waterworks already regulated by VDH ODW. Design and construction standards of the community/Town and LW requirements also shall be met. As previously described, a construction permit will be needed for the distribution system, unless a general permit for distribution mains is granted (12VAC5-590-300). All requests for a construction permit are directed initially to VDH ODW but will also need to be in compliance with the permit issued for the utility distribution system being connected to. This means that the system design will need to be reviewed by the licensed operator of the existing public Waterworks for conformance to the existing system's requirements prior to submitting the request for a construction permit to VDH ODW. Following completion of construction, an amended Waterworks Permit Application for operation (operation permit) would need to be submitted through VDH ODW.

2.4.1.2 Wastewater

Chapter 1066 of the LCCO provides detailed information for the permitting, design, and maintenance of onsite sewage treatment systems, including those utilizing subsurface disposal, in Loudoun County, Virginia. Onsite sewage systems cannot be installed, constructed, altered, repaired or extended without a valid permit from LCHD. Should a new system be constructed, a permit for construction will need to be obtained. This code includes details for the following types of systems:

- Conventional onsite sewage system – septic tank(s) with conveyance to a gravity distributed subsurface drain field
- Alternative discharging sewage system – any device or system which results in a point source discharge of treated sewage for an individual single-family dwelling
- Alternative onsite sewage system (AOSS) – a treatment method that is not a conventional onsite sewage system or an alternative discharging sewage system and that does not result in a point discharge

For any upgrades to existing systems or construction of a new conventional onsite sewage system, this code applies and an LCHD permit will need to be obtained. A soil evaluation report will need to be submitted to prove that a satisfactory system can be installed. Plans and specifications shall be submitted to LCHD for approval. The onsite sewage treatment system shall be located on the lot, tract or parcel of land which it serves. However, onsite sewage treatment systems on off-site easements may be permitted in several situations, such as to replace a failing onsite sewage treatment system. The code also details requirements for maintenance, such pumping out the septic tank every five (5) years. **Table 2-2** lists several minimum setback distances for septic tanks and drainfields.

Table 2-2 – Minimum Septic Tank/Subsurface Facility Setback Distances

STRUCTURE/TOPOGRAPHIC FEATURE	MINIMUM DISTANCE (FT) SEPTIC TANK	MINIMUM DISTANCE (FT) SUBSURFACE DISPOSAL FIELD
Driveways	5	5
Impounded Waters	50	50
Streams	50	50
Property Lines	10	10
Top Edge of Banks and Cuts	20	10
Inground Pools	20	20

For a community drainfield, the details listed for AOSSs in this code apply, including the minimum setback distances listed in the above **Table 2-2**. These systems shall be maintained in accordance with requirements of the State Board of Health. Chapter 1067 of the LCCO outlines additional requirements for AOSSs. These requirements include an agreement approved by the County Attorney and executed by the Health Officer and property owner, and an annual inspection by an individual licensed by the Virginia Department of Professional and Occupational Regulation.

In addition to the setback requirements summarized in **Table *2-2***, additional buffer zone requirements for sewage treatment facilities are outlined in 9VAC25-790-460, Table 2.

VDH also regulates AOSSs (12VAC5-613). According to VDH, large AOSS permits need to be renewed every five (5) years. A large AOSS is defined as "an AOSS that serves more than three attached or detached single-family residences with a combined average daily sewage flow greater than 1,000 GPD or a structure with an average daily sewage flow in excess of 1,000 GPD." VDH written approval of active and reserve drain field sites will be required. For an AOSS, site and soil characterization are required, and the site shall not be flooded during the wet season. It should be noted that all soils investigation reports completed should also be provided to LW during the preliminary engineering report phase. VDH regulations for an AOSS are further described in the overview of the soil analysis in Section 4.3.

Per 12VAC5-613, large AOSS's must be placed on a regular sampling schedule with continuous monitoring via manned operation of telemetry monitoring. For treatment works with less than 40,000 GPD, monthly sampling is required. And for treatment works with a design flow of 40,000 GPD or greater, weekly sampling is required for several water quality criteria, such as Biological oxygen demand, total suspended solids, and total nitrogen.

The SHDR regulations developed by VDH also apply to a community drainfield, which would be considered a large AOSS. These regulations assure that all sewage is handled and disposed of in a safe and sanitary manner and are enforced for systems utilizing a subsurface discharging treatment plant. Type III sewage disposal system requires submission of an application, a preliminary conference with LCHD and submission of formal plans, specifications and design criteria required to obtain a construction permit.

Chapter 8 of the LW EDM also details requirements for "Community Wastewater Systems." The Community Wastewater System shall be approved by LW, and the procedure for reviews and approval by LW can be found in Appendix D of the EDM in the chart titled "Community Systems Design Review Process." Before accepting any community wastewater system, LW shall review and approve all design documents applicable to that system, including the basis of design, preliminary engineering report, and plans and

specifications. This review and approval are in addition to, and take precedence over, required approvals by County, State, and Federal authorities. A certificate from the Loudoun County Zoning Administrator, a site plan permit, basis of design report, selection of treatment technology and selection of land application of treated effluent are required in the application for a certificate to construct a community wastewater system. Community wastewater systems shall be classified as Reliability Class I.

Should a community wastewater treatment system that discharges to Beaverdam Creek be chosen, the SCAT regulations provided by the VA DEQ govern the design, construction and operation of sewage systems that have a wastewater treatment system which discharges to a surface water and that serve more than one (1) resident or a non-residential sewage source. These systems require a preliminary engineering conference with VA DEQ, a VPDES permit application to obtain a permit to build a new sanitary sewer system (which may include a preliminary engineering report and drawings), a VA DEQ permit to construct referred to as a Certificate to Construct (CTC) and a VA DEQ permit to construct referred to as a Certificate to Operate (CTO). Furthermore, according to Chapter 8 of the LW EDM, the Design Engineer may apply directly for a VPDES or VPA permit, however LW must approve a Basis of Design prior to the Preliminary Engineering Conference and must approve a Preliminary Engineering Report prior to submitting the official Preliminary Engineering Proposal to VA DEQ. Applications to VA DEQ shall be made with the knowledge and approval of Loudoun Water who, acting as owner and operator, shall become the permit holder. Furthermore, draft and final operation and maintenance manuals must be approved by Loudoun Water prior to submittal to VA DEQ for approval.

It should be noted that any construction needed for structures, site access for treatment or distribution buildings will require a Loudoun County site plan approval, Loudoun County grading permit and Loudoun Water easements. The design and profiles for the sewer distribution network throughout Unison will be submitted to Loudoun Water for review and approval as well as to the Virginia Department of Health via the Loudoun County Health Department through the application process for a Certificate to Construct.

2.4.1.3 Wastewater – Surface Discharge Water Discharge

Wastewater treatment surface discharge facilities require strict compliance with various codes, standards, and regulations relating to surface discharge. Sewage Collection and Treatment (SCAT) regulations govern the design, construction, and operation of sewage systems and treatment works serving more than one residential or non-residential sewage source. Within the Commonwealth of Virginia, SCAT regulations are administered by VDEQ and are found in Virginia Administrative code 9VAC25-790. These standards govern design and operation of the proposed treatment facility.

In addition to SCAT regulations, VDEQ administers various permits that are required for all surface water discharge facilities. VDEQ oversees the Virginia Pollutant Discharge Eliminations System (VPDES) program in accordance with the Clean Water Act's aims to prevent pollutants from getting into streams, rivers, and bays. VDEQ requires any potential developer of a new sanitary sewer system and treatment facility to obtain a VPDES permit prior to construction. In addition to this, the developer must obtain a VDEQ "Certificate to Construct" permit (CTC). Upon completion of construction and as a condition for substantial completion, the developer must also obtain a "Certificate to Operate" permit (CTO) issued by VDEQ.

2.4.1.4 Fire Protection

Loudoun County and thereby Loudoun Water require fire flow capability for Community Water Systems. Loudoun County has special provisions for communities like Unison where an extension of a central water supply system or community water system is not available. Section 2.3 of the Loudoun County's FSM states that water supply facilities shall provide fire protection to serve areas where water systems are not available for fire protection. These areas require storage tanks that consist of either two (2) tanks that provide a minimum of 15,000 gallons of storage, or one (1) tank that provides a minimum of 30,000 gallons of storage. These storages must be spaced every 2,600 linear feet (LF) of roadway.

These communities can also designate a natural water source (stream, river, creek) as a water supply facility if the natural water source can provide 1,000 gpm of water for thirty (30) minutes for fire protection year-round. Other natural water sources, like ponds, quarries, and other open bodies of water can be designated as a water supply facility if they have a normal depth of five (5) feet at the draft pipe and contain a minimum of 30,000 gallons of water year-round.

Additionally, Chapter 1042.03 of the Loudoun County FSM requires that new water systems or extensions of existing water systems have sufficient capacity for fire flow. The use of water tanks will allow for this requirement to be indirectly accounted for.

Using wells for fire protection is not feasible due to the quantity of water that would be required from the wells. Therefore, using day tanks or a natural water source as outlined above are the two feasible options for the community and should be considered if the alternative selected requires design. For Unison, approximately three (3) holding tanks would be necessary to provide adequate fire protection as required by the Loudoun County FSM. Holding tanks would be underground structures following the standard County detail for dry drafting fire hydrants. Per the Loudoun Water Engineering Design Manual (Chapter 7-J-11), unless otherwise approved by Loudoun County, the Community Water System would require fire flow. For the purpose of this report, no further discussion or cost estimating is provided for the fire protection systems.

2.4.2 Environmental

In December 2021, a preliminary environmental screening inventory was completed for the Unison Community, which is included as **Appendix A**. This section discusses key findings of the environmental screening, as well as related environmental permitting considerations.

If the project for the chosen alternative is federally funded, it may be necessary to perform a National Environmental Policy Act (NEPA) review of the project. The level of NEPA documentation that might be required will be dependent on the anticipated significance of environmental impacts for the work. A NEPA review would require cataloguing the potential for the project to impact numerous environmental resources, including (but not limited to) streams and wetlands, floodplains, threatened and endangered species, hazardous materials sites, environmental justice populations and land use patterns.

A review of the U.S. Fish & Wildlife Service's Information for Planning and Consultation (IPaC) database detailed the potential for the following species to be encountered within the project area. These include the Northern Long-eared Bat (*Myotis septentrionalis*; Listed Threatened Species), and the Monarch Butterfly (*Danaus plexippus*; Unlisted, Candidate Species). Additionally, the Virginia Department of Wildlife

Resources has listed potential for two (2) State Threatened Species to be encountered within the project area, which are the Loggerhead Shrike (*Lanius ludovicianus*) and the Green Floater (*Lasmigona subviridis*). These reviews are only valid for a 90-day period; additional review is recommended at the project permitting stage.

Time of Year restrictions for construction may be required by the permitting agencies for tree clearing and instream work to avoid and minimize impacts to the bat and mussel species, respectively. At the time of this review, candidate species have no protections afforded under the Endangered Species Act. It should be noted that the Northern Long-eared Bat is proposed to be elevated to Endangered status potentially later this year (2022), which may have impacts of Time of Year restrictions for tree removal. Permitting review processes for any project effects to state threatened and endangered species, as well as game and non-game species (including insects), will be conducted by the Virginia Department of Wildlife Resources (VA DWR) and the Virginia Department of Conservation Resources (VA DCR) as coordinated by the relevant permitting agencies (i.e., United States Army Corps of Engineers (USACE) and/or VA DEQ). Permits will be needed for any timber sales through the Virginia Department of Forestry.

The U.S. Fish & Wildlife Service National Wetlands Inventory Database, as well as the Loudoun County Geographic Information System (GIS) maps, were reviewed to assess the location of potential wetlands and streams within and adjacent to the project area. Mapped streams and wetlands exist within the project area. However, these areas are small and can likely be avoided. Dependent on the proposed amount of impacts to jurisdictional wetlands and streams, regulatory permitting agencies may require avoidance, minimization and eventually mitigation for unavoidable wetland impacts and conversion of wetlands to uplands, as well as the conversion of forested wetlands into either non-woody emergent wetlands or maintained utility right of ways. Wetland and stream mitigation banking costs have been varying wildly, based on availability, but can be as high as $500,000 per acre and $850/linear foot of stream channel.

A wetland delineation and Jurisdictional Determination for the project area would need to be completed and submitted to USACE to determine the location and extent of jurisdictional waters within the project area. If the project impacts Waters of the U.S. (WOUS), including jurisdictional wetlands and stream channels, either temporarily or permanently, a Section 404 permit under the Clean Water Act would need to be issued by the US Army Corps of Engineers (USACE) to allow for construction activities to commence. A Virginia Water Protection (VWP) Permit would be required through VA DEQ for any impacts to state waters and wetlands that requires a USACE permit without a Section 401 certification. A permit to construct in Virginia tidal wetlands and subaqueous bottoms, as issued by the Virginia Marine Resources Commission (VMRC), may be required if the proposed alignment crosses Beaverdam Creek or any tributaries with over a five (5) square-mile drainage area.

Based on a review of the Federal Emergency Management Agency (FEMA) floodplain map, nearly the entire project area lies outside of a flood hazard area. Some areas in the western most limits lie within Zone X, an area with 0.2% chance of an annual flood hazard. The Loudoun County Stormwater Management Program will need to be consulted for measures regarding construction site runoff control and post-construction runoff control. Loudoun County manages floodplains in accordance with FEMA regulations and Section 4-1500 of the Zoning Ordinance. Therefore, preparation and submittal of a Conditional Letter of Map Revision (CLOMR) will be required through Loudoun County prior to construction of a distribution main. Following construction, preparation and submittal of Letter of Map Revision (LOMR) will be required.

A Virginia Stormwater Management Program (VSMP) Construction General Permit and Stormwater Pollution Prevention Plan (SWPPP) may be required by VA DEQ if limits of disturbance are in excess of 1 acre.

The VA DEQ – What's in My Backyard database was reviewed in order to identify documented Hazardous Material Spills, as well as the location of existing Registered Tank Facilities and known Petroleum Releases. The database results noted three closed petroleum spills, and one closed registered petroleum tank facility within the project area. While the incidents are closed, there is still a potential to encounter petroleum contaminated soils downgradient of the spill site. VA DEQ permitting processes should also be followed for any hazardous materials issues and/or air quality impacts caused by a project and any need for an Emergency Generator or Concrete Batch Plant Permit.

According to the VA DEQ VEGIS TMDL_IP Watersheds, the project area watershed is impaired for bacteria.

Using an online mapping tool provided by The Virginia Department of Conservation & Recreation, no documented Federal Lands, State Parks, or Local Lands were found within the planned project vicinity.

2.4.3 National Register of Historic Places

The Village of Unison is recognized as a National Historic District (ID#3000442) on the National Register of Historic Places (NRHP). Due to this, any proposed above ground structures will likely need to be architecturally designed to blend in with the district.

Furthermore, the Battle of Unison, which encompasses the entire village, is registered on the NRHP. Both the Battle of Middleburg and the Upperville Battlefield are "Potentially Eligible" for listing as an NRHP. Additional details are provided in the following Section 2.4.4.

It should be noted that compliance with Section 106 of the National Historic Preservation Act (NHPA) is required for all undertakings that involve a federal action, which might include an activity on properties owned, leased, or controlled by the Federal government, undertakings which require Federal licenses, permits, or approvals, or actions that are assisted by Federal funds, including grants. Dewberry has identified two (2) potential Federal actions which may trigger a Section 106 review for all alternatives:

- Use of federal funds and/or application for a federal grant
- Permitting of impacts to Waters of the U.S. (wetlands and streams) via Section 401/404 Clean Water Act Permits (depends on selected alternative and alignment)

Section 106 consultation is the responsibility of the agency performing the relevant federal action. When submitting projects, if multiple federal agencies are involved, it will be necessary to determine which Federal agency will be the lead agency reviewing the project for Section 106. It is anticipated that this review may be applicable to all alternatives, except for Alternative #1 (upgrading existing systems).

2.4.4 Loudoun County & Virginia Historic District

Unison is subject to the requirements of the Historic District Guidelines within Loudoun County, and Unison was placed on the Virginia Landmarks Register (ID#053-0692) in 2002 as the Unison Historic District. The

Historic District Review Committee (HDRC) also has jurisdiction to review projects within the County. Projects in these districts are subject to these reviews to ensure that the historic character of the area is maintained. Typically, this review is focused on architectural elements. This will require consideration when designing any structures that may be needed for treatment or distribution.

Several properties within the Unison study area fall within the Beaverdam Creek Historic Roadways (HR) District, as shown in **Figure 2-3**. The Beaverdam Creek HR District is comprised of a network of 32 rural roads located in the southwestern corner of Loudoun County. The Beaverdam Creek HR District Guidelines, which supplement the Loudoun County Historic District Guidelines, apply to adjacent parcels and are limited to 35 feet from the designated roadway centerline.

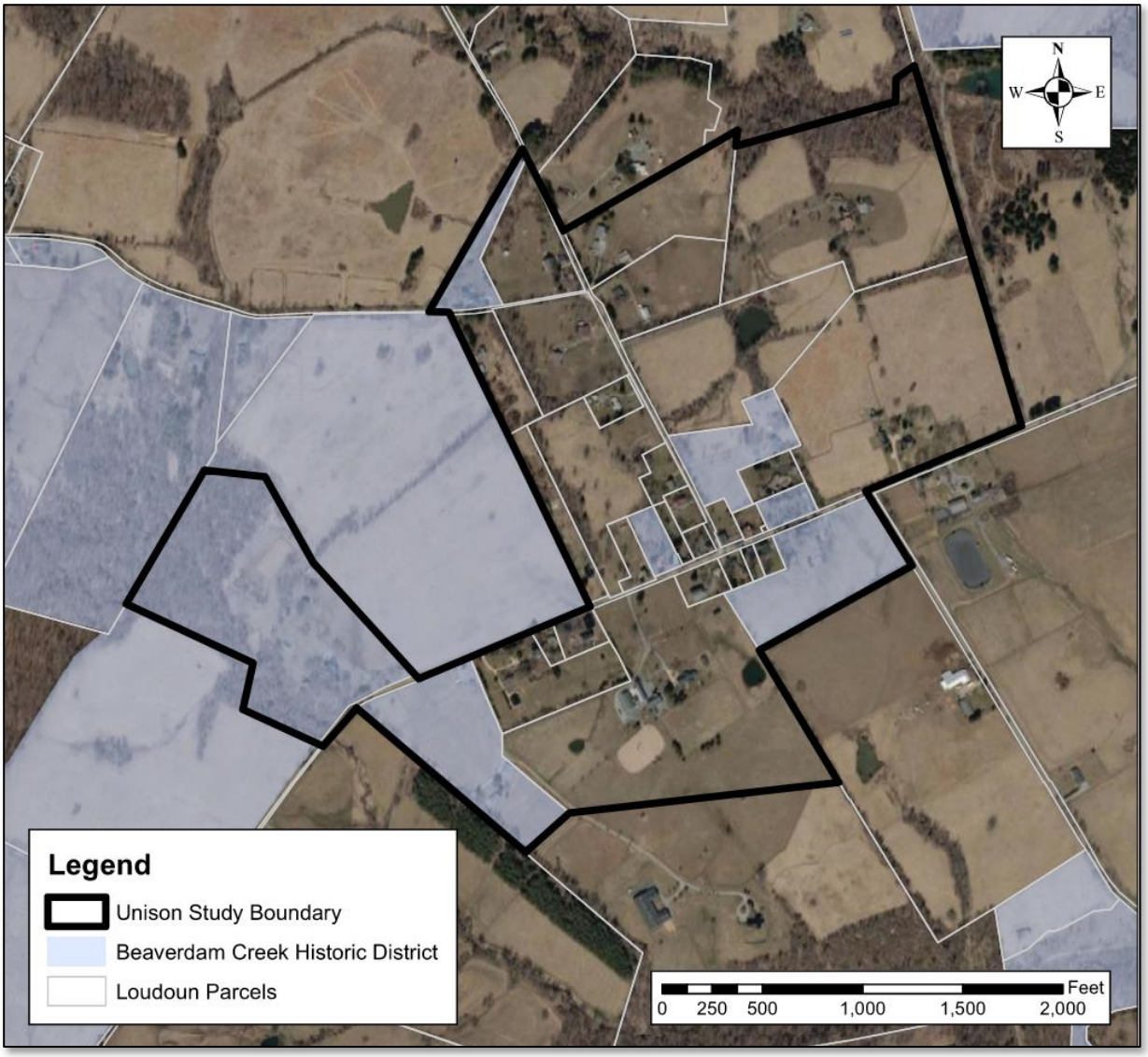

Figure 2-3 – Beaverdam Creek Historic District

Article 6-1800 of the Revised 1993 Loudoun County Zoning Ordinance (LC ZO) provides for the protection of historically and culturally significant areas and requires compliance with land use regulations and architectural guidelines.

Article 6-1900 of the LC ZO outlines the regulations of Historic Districts. Actions changing or adding vertical structures (i.e., any structure that is built within a Loudoun County Historical District, including fences, signs, etc.) will require application and receipt of a Certificate of Appropriateness (CAPP) through the HDRC, per Section 6-1900 of the Zoning Ordinance. A CAPP is not required for sidewalks or driveways and excludes farm fences and bona fide farm buildings primarily used or to be used for agriculture or horticultural purposes.

Article 6-1900 of the LC ZO outlines the Loudoun County HDRC. Plans must be presented to and reviewed by the HDRC. It should be noted that the approval of a CAPP does not guarantee issuance of a zoning permit.

It should be also noted that the Heritage Preservation Plan may be referenced to aid in project design. This plan outlines policies and strategies to preserve heritage resources. Permits do not require implementation of this plan, however; the Loudoun County Heritage Commission and Loudoun County Planning and Zoning monitor the implementation of this Plan countywide.

Once a project is designed and the construction plans are submitted, any subsurface disturbance will require a Phase 1 archaeological survey through Loudoun County Planning and Zoning, within the limits of disturbance of the project (per the Loudoun County Facilities Standards Manual, Section 7.810.C). If one has already been completed as part of another agency's review process, and/or the area has been subject to previous disturbances that would have degraded existing archaeological resources, then documentation would need to be submitted to the County as part of the Site Plan approval process to justify an exemption to the requirement for a Phase 1 survey.

Dewberry conducted a review of the Virginia Department of Historic Resources – Virginia Cultural Resource Information System (VCRIS) to assess if any documented archaeological and/or architectural resources have been noted within the project area, and if any Phase I surveys have been conducted.

As of this study, the village has not undergone Phase 1 surveys for archaeological or architectural resources. If a Phase I survey is required by the resource agencies, it will likely require excavation of screened shovel testing within project limits of disturbance, general site reconnaissance and a technical report outlining the historic contexts of the project area. Additional resources may be discovered.

The Unison Historic District and the Unison Battlefield Historic District encompass the project area and contain nine distinct architectural resources and 25 individual historic properties. According to the Virginia Department of Historic Resources (VDHR), only two of these resources have been evaluated for listing as a "historic place".

Three battlefields were found to intersect with the project area, these include: The Battle of Middleburg, the Upperville Battlefield, and the Battle of Unison. The Battle of Middleburg and the Upperville Battlefield do not strongly intersect with the project area, the furthest extents of these historic areas lie within Unison and are largely associated with Route 630 and 626; neither of these are listed on the NRHP or the Virginia Landmarks Register (VLR). The Battle of Unison, however, encompasses the entire village and the Unison Historic District; the Battle of Unison is registered on both the NRHP and VLR. The VDHR lists both the Battle of Middleburg and the Upperville Battlefield as "Potentially Eligible" for listing as a NRHP or VLR.

Within the Commonwealth of Virginia, Section 106 reviews for effect on cultural resources are primarily conducted by VDHR. If the project will involve a Federal action, a VDHR review of activities such as ground disturbance or construction of above-ground structures that have the potential to affect known or suspected historically significant cultural resources, historical areas, or buildings, will be coordinated through the federal agency approving or funding the project. Depending on the proposed design and pending Section 106 reviews/determinations, there is potential for a viewshed analysis to be required for any substantial structures that are proposed as part of the project due to the presence of multiple Battlefields. A Technical Assistance Review will be important to determine the need for a viewshed analysis, and VDHR will decide if a viewshed analysis will be required. These types of actions are anticipated for all alternatives.

The project designer may request a Technical Assistance Review from VDHR to aid in determining the necessary requirements of the project. This Technical Assistance Review is completed prior to submitting a full application for review and assists in identifying features/easements which may be impacted, permits that will be required, and frameworks within which mitigation activities may be required. Due to the state-level permits that may be required, it is strongly recommended that a Technical Assistance Review be completed for the chosen alternative prior to submitting the design for formal review.

In addition, VDHR administers existing historical preservation easements within the community of Unison that are held by the State Historic Preservation Office (SHPO). There are multiple conservation easements that intersect with the project area, as shown in **Figure 2-4**. These lands typically require replacement lands of both equal and adjacent if impacted. In addition, any work performed on a parcel with an existing conservation easement would require approval from the conservation easement holder.

The conservation easements serve to preserve and limit development of open-spaces, historic, and recreational areas within Virginia. The easements vary from property to property and development restrictions depend on the type of conservation the easement is specific to. To perform work within the easements, coordination with the property owner and easement holder would be required to determine easement specific requirements and allowable work as well as to obtain approval.

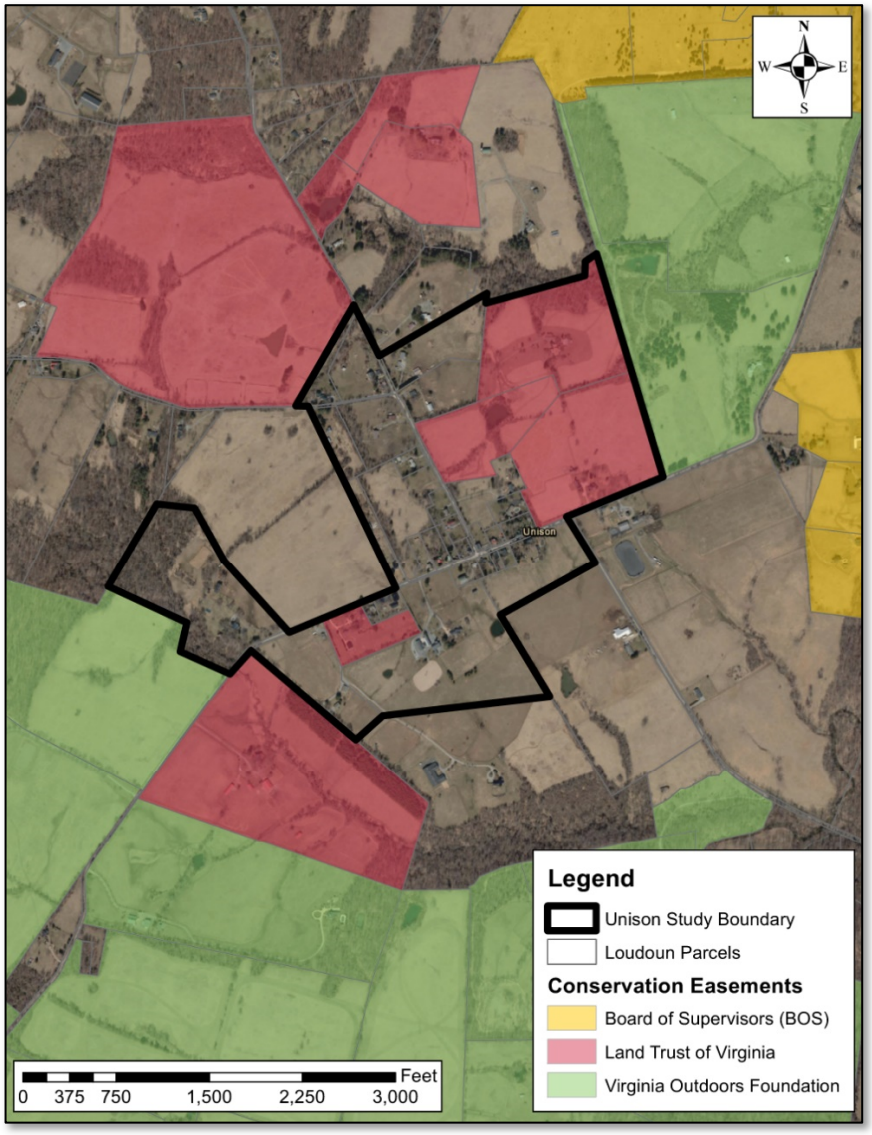

Figure 2-4 – Unison Conservation Easements

A review would be completed for each parcel that is affected within an option, as VDHR historical easements are recorded by parcel. By law, this review cannot be conducted for any project in the absence of consultation with the property owner. There must be proof of discussion with the property owner and approval from the property owner in order to obtain approval for any submission that affects historical easements. It should be noted that VDHR historical easements cover different criteria for each parcel. For example, certain easements exist to protect structures and character defining features. Furthermore, not all easements allow for auxiliary structures, which are considered to be both above and below ground, that serve anything other than their property. VDHR is required to work within the language in each easement, however; as in the case of a health/safety issue, flexibility may be maximized to allow for exceptions to these easements to alleviate such issues. These issues will be reviewed on a case-by-case basis. Considerations will need to be made within all of the alternatives to adhere to this historical easement review requirement.

2.4.5 Loudoun County 2019 Comprehensive Plan & Rural Policy Area

Per the Loudoun County 2019 General Plan (2019 GP), Unison is within the Rural Policy Area (RPA) and is in an area designated as the Rural South Place Type. As shown in **Figure 2-5**, the entire project area is within the RPA. The Rural South is characterized by the equine industry and large working farms, which are accessed by a network of primarily unpaved rural roads. The 2019 GP policies for the RPA are aimed at protecting existing community characteristics and landscape, preserving heritage resources, and developing agricultural and rural economy uses, while limiting residential development. Public facilities are listed under conditional uses for the Rural South. For public utilities to cross the RPA, a "public health" need will need to be established and the utility will need restrictive easements. The 2019 GP policies allow the construction of community water and wastewater systems in this area, as the document states, "shared community water and wastewater systems may be utilized for cluster developments and rural economy uses."

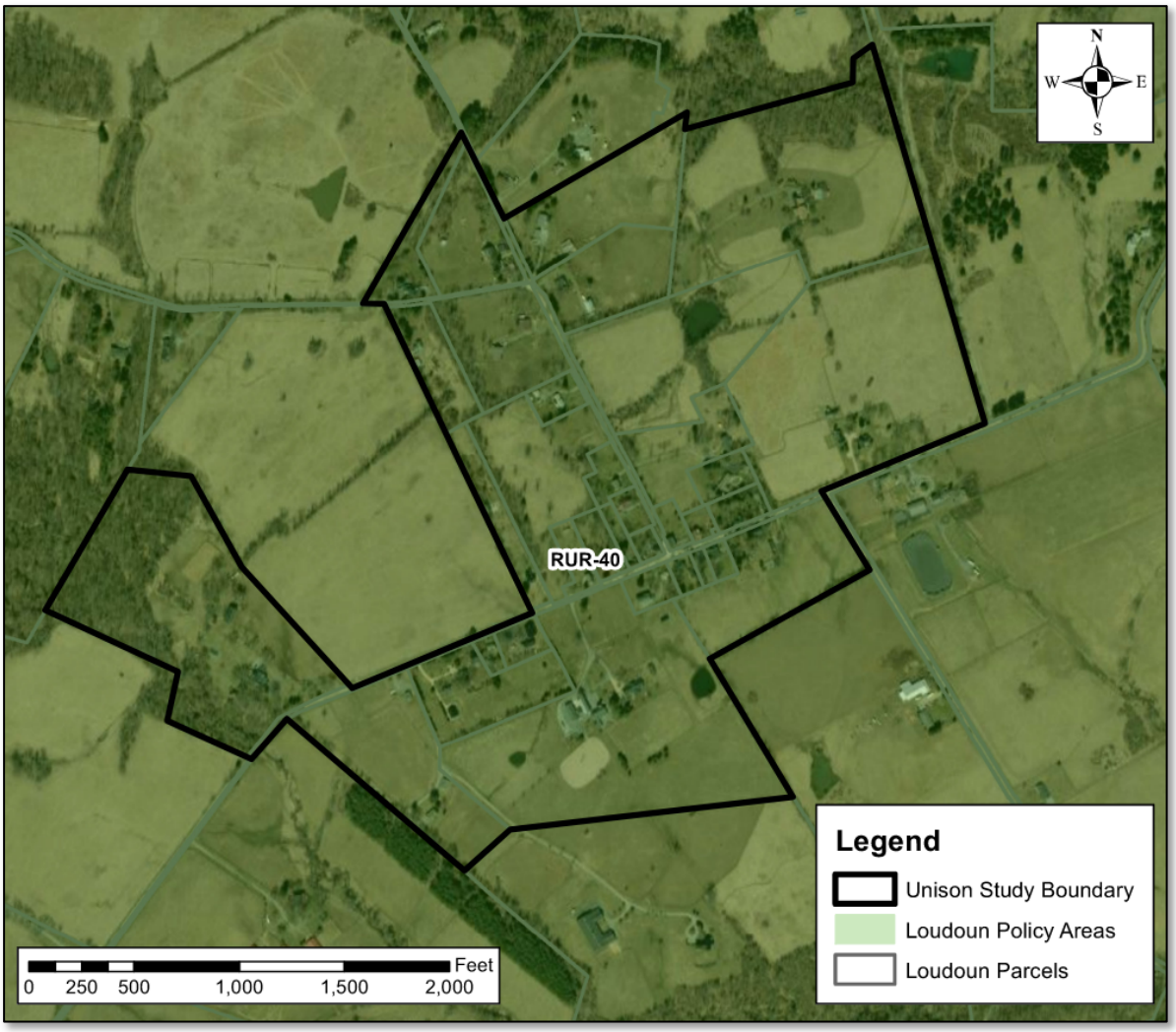

Figure 2-5 – Unison Rural Policy Area

2.4.6 Zoning Ordinance

Properties within the project area are also governed under the provisions of the LC ZO. The entirety of the study area is zoned Agricultural Rural-2 (AR-2). AR-2 zoning permits agricultural and low density residential with a base density of one unit per 40 acres. The Cluster Subdivision Option allows for a communal water system and a communal sewage disposal system located within common open space. Municipal water wells, municipal drinking water reservoir, and water and sewer pump stations are permitted uses in AR-2 zoning. Water and wastewater treatment plants and water storage tanks will require a special exception.

All public utility facilities will be required to obtain a Commission Permit (CMPT), per section 6-1100 of the Zoning Ordinance. The CMPT process is a six (6) to nine (9) month legislative approval process that requires Loudoun County staff review, a Planning Commission public hearing, and ratification by the Board of Supervisors. Loudoun County staff will review the application and provide a recommendation to the planning commission for granting the CMPT. The Planning Commission has the purview to approve a CMPT even with a recommendation of denial, and the Board of Supervisors may ratify or overrule the Commission by a majority vote.

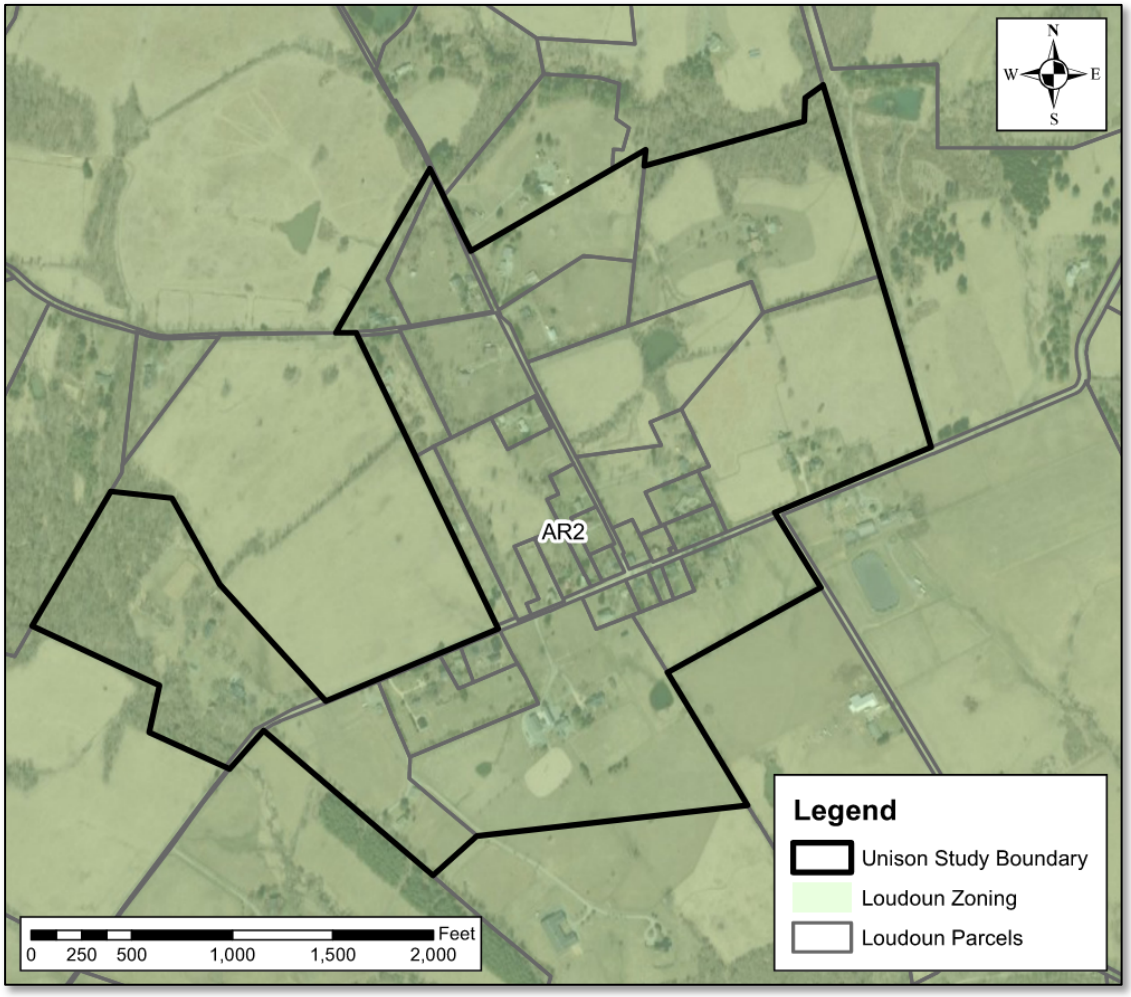

Figure 2-6 – Unison Zoning

2.4.7 Village Conservation Overlay District

In review of historical information and available Loudoun County GIS data, it was determined that Unison is not located within a Village Conservation Overlay District.

2.4.8 Loudoun County Building and Development

Any construction needed for structures, site access for the wells or treatment or distribution buildings will require a Loudoun County site plan approval, Loudoun County grading permit and Loudoun Water easements. A Virginia Stormwater Management Program (VSMP) Construction General Permit and Stormwater Pollution Prevention Plan (SWPPP) is also necessary for site plan approval. A grading permit is required prior to any construction. The design and profiles for the water distribution network throughout Unison will be submitted to Loudoun Water for review and approval but are not required for Loudoun County review.

2.4.9 Virginia Department of Transportation

Construction plans will be submitted to the Virginia Department of Transportation (VDOT) to obtain the necessary land use and utility permits to do work in VDOT right-of-way (ROW). Exact requirements and ROW impacts will not be known until alignments have been further developed. Detour and traffic management plan approval from VDOT will be needed for any construction in the ROW. **Figure *2-7*** shows that most of the roads in Unison are VDOT-designated roads.

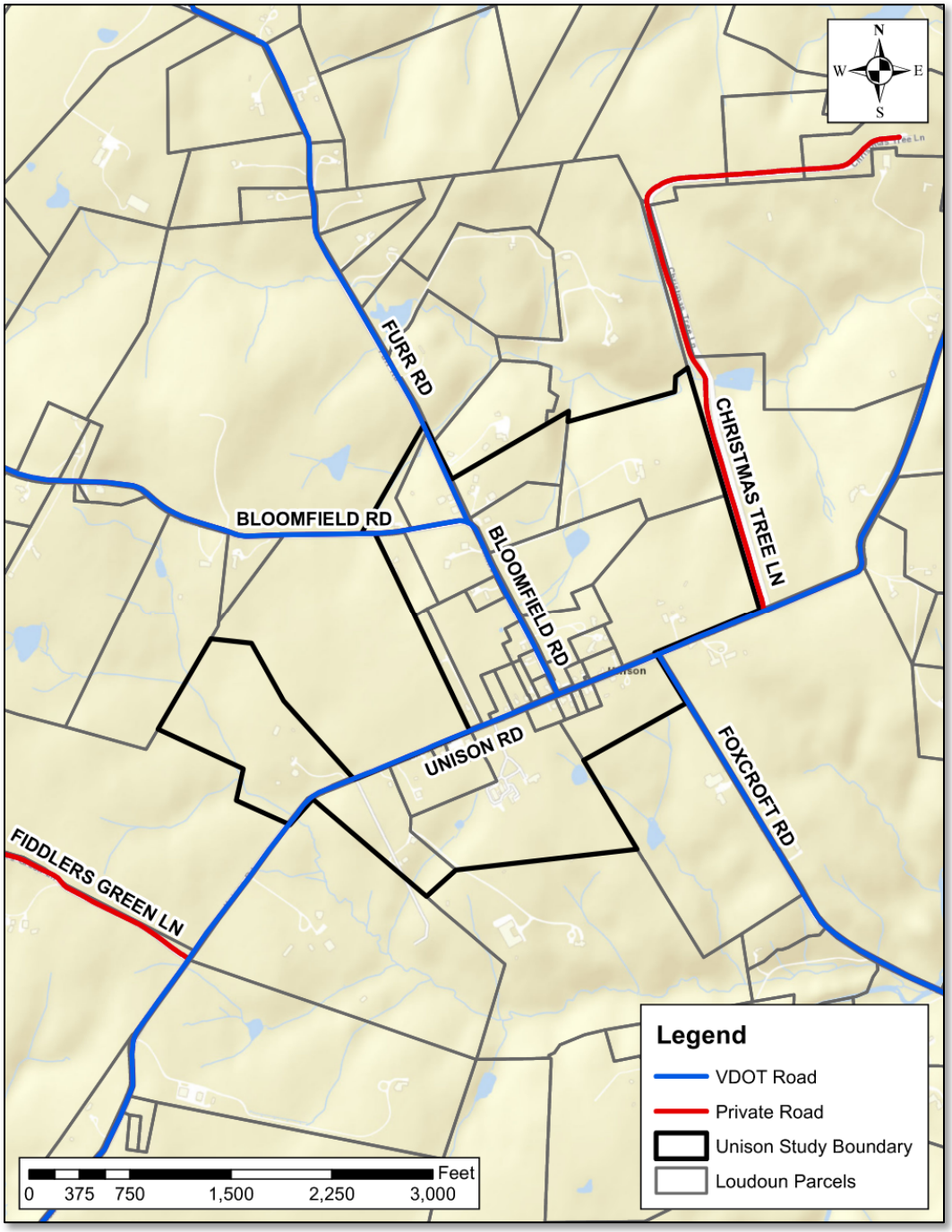

Figure 2-7 – VDOT Roads

Many of the parcels lack consistently defined right-of-way and depending on the alignment, easements may be required on private property throughout the community. Encroachment agreements will be needed to impact and/or cross existing easements. Titles should be obtained on properties that will be encumbered by construction and existing utility designations obtained prior to design in order to avoid potential conflicts. The community also has many historic structures, such as homes and stone walls, very close to right-of-way. Care should be taken to not impact historic structures when designing the water/sewer alignments and locations of necessary appurtenances.

3.0 WATER SYSTEM EVALUATION

3.1 Preliminary Existing System Analysis

Unison is located in the Beaverdam Creek watershed, which is in the North Fork Goose Creek major watershed area. According to Loudoun County GIS data, there have been approximately 66 individual private wells installed in the Unison study boundary since the 1950's, including 46 individual water wells (WWIN type), 15 hand dug wells (WWDU), three (3) "dry hole" wells (WWDH), one (1) irrigation well (WWIR) and one (1) non-community water-supply well (WWNC), as shown in **Figure 3-1**.

Approximately 51 wells are currently active, 14 wells are abandoned or believed to be abandoned and the status of one (1) well is unknown. Some residences rely on more than one (1) well to provide an adequate water supply and two (2) residences provided survey responses indicating that they use cisterns to supplement water.

The average age of the wells is approximately 39 years old, and over 30 wells are more than 40 years old. Depth of the wells range from 300 to 1000-feet deep, with the average being approximately 600-feet deep. Yields of the wells range from 0.5 gpm to 9 gpm, with the average being approximately 3 gpm. Although, per health department research, the majority of wells within the community have well yields below 3 gpm, ranging in well yields from 0.5 gpm to 1.5 gpm.

This section reviews the Unison application and existing well and groundwater data, which have been evaluated from health department records, a groundwater hydrology report prepared by Emery & Garrett and citizen survey results.

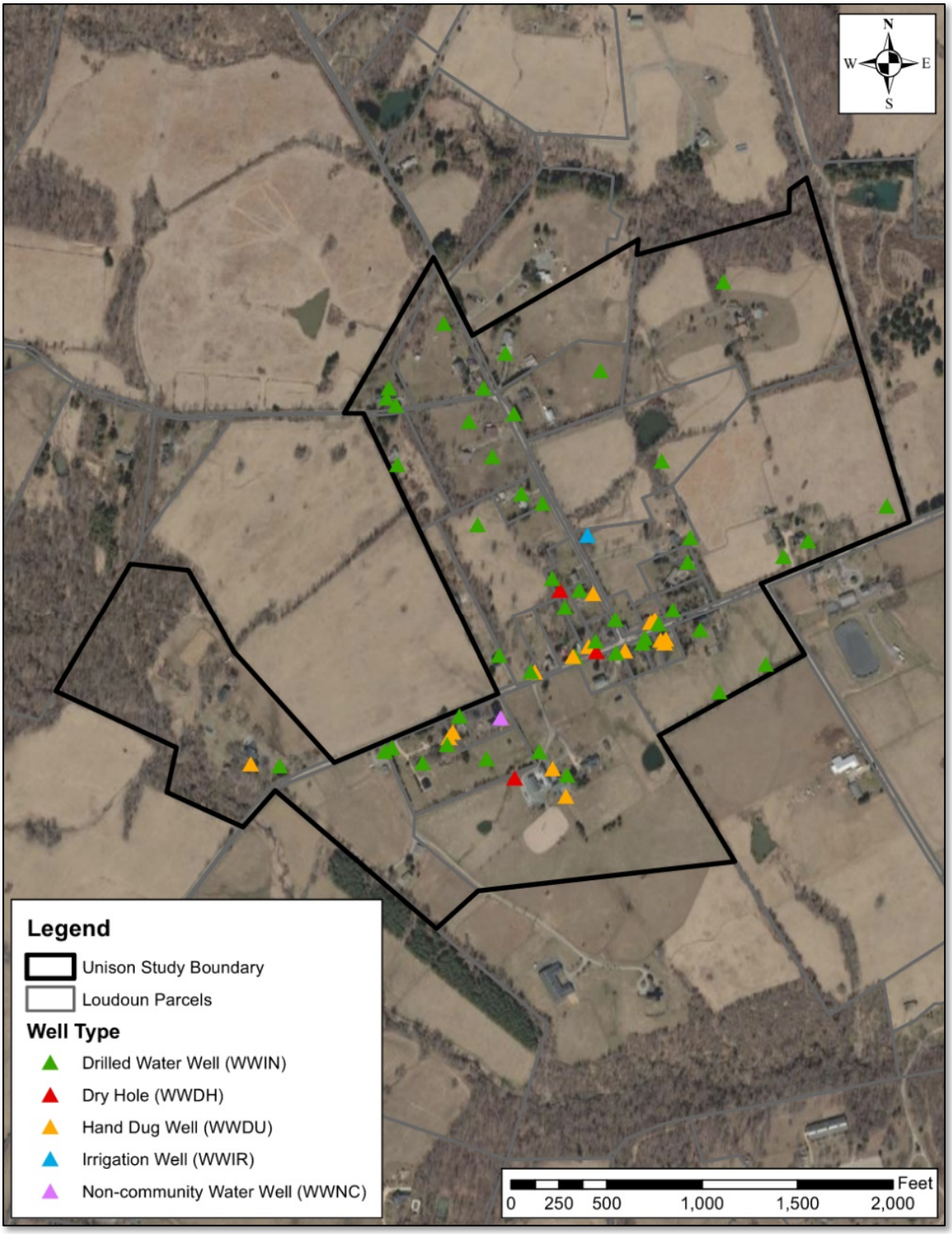

Figure 3-1 – Unison Wells

3.1.1 Unison Application

The community of Unison applied to The Program in 2020, and the community application is included as **Appendix B**. The application indicates that there are 32 individual wells within the community. The application describes the issues that the community faces with water, as it states, “the geology of the village is not optimal for a consistent supply of well water, and some residents must resort at times during the year to truck in water for non-potable needs.” The application also explains that the majority of the community is in support of establishing a community water system.

3.1.2 VDH and Health Department Data

Existing health department records were reviewed through VDH ODW’s open-information online database, Online Responsible Management Entity (RME). The database includes records of well and sewer system applications, such as well and septic system permits, inspections, etc. It should be noted that well inspections are not routine and occur following complaints, prior to real-estate transfer and following connection to a newly constructed well. Due to the lack of routine inspection, some wells could have become non-compliant since last inspection. It should also be noted that records of some parcels are non-existent, as older wells do not have records. Furthermore, there are inconsistencies in records, such as lots being identified as “septic with gravity” despite records showing septic had been abandoned. Therefore, the information presented in this section is not comprehensive. This section summarizes key findings of the research, and a more detailed summary of research can be found in **Appendix C**.

Records were available for 33 out of 34 parcels within the Unison community. Evidence of past water problems were found for 17 out of 33 parcels (approximately 51%). A few of the issues these parcels reported in the past include failed coliform screenings (5 parcels), reports of odor (3 parcels), iron, manganese and turbidity levels > MCL (6 parcels), and reports of dried up, or low yield wells (7 parcels). Therefore, documentation of dried up or low yield wells was most common. Notably, one (1) property reported four (4) instances between 1974 and 1995 of coliform present in their well sample, and another property reported three (3) instances between 1988 and 1989. Below are quotes from several different properties regarding these issues:

- From a Record of Complaint - “Black-silt looking water. Very low pressure. Suspects sewage backing into H2O. Possibly more than one dwelling on the well”. (5/14/1991)
- From a letter - "the well also is not generating enough water to be useable". (5/20/1991)
- From a Notice of Violation - “During the site visit it was discovered that periodically the existing well serving this structure provides inadequate water yield. Because of this situation, the neighbor’s well is being used as a water source in order to supplement the low-yielding well.” (9/7/1992)
- From an application for water permit - "well low yield, need to drill a new well". (5/14/1999)
- From a well/water system construction permit - "drilled well going dry". (10/27/1999)
- From a note - "owner inquired @ well yield/depth, going dry at times". (3/23/2006)

There is evidence that one (1) parcel has current water problems, as a 2021 letter states “the current well is a hand dug well that sometimes needs to be filled by outside sources which is not ideal for a water source.”

In addition to the aforementioned 'hand dug well', the health department research also shows that at least one other parcel within the Unison community may also be utilizing a hand dug well as a primary water source. Hand dug wells are generally shallow (<15-ft deep). These wells utilize shallow groundwater sources and are therefore more susceptible to contamination from pathogens, spills and other above ground activity. Furthermore, due to the shallow nature of the wells and the water source, these wells also may be susceptible to the effects from droughts.

Another common issue within the community, based on health department data, is low well yields. Fifteen (15) residences within the community have reported well yields of less than 3 gpm. Per Virginia Administrative Code (12VAC5-630-460), newly constructed private wells shall "be capable of delivering a sustained flow of 5 gpm per connection. Systems with a capacity of three gallons per minute or more do not require additional storage." This suggests that the minimum suggested well yield for residential supplies is 3 gpm. Therefore, approximately 45% of the community have well yields below the recommended standard. Additionally, four (4) wells within the Unison Community have records for hydrofracking permits from 1986 to 2012. This is well-development process that involves injection of water under high pressure into bedrock and is used to address low well yields.

Also, the data suggests that approximately twenty-seven (27) parcels currently have at least one active well that was developed prior to implementation of the Virginia's Private Well Regulations, which were implemented in April of 1992. Prior to this, the Virginia Private Well Construction Act of 1986 placed limited construction requirements on the well construction. Before 1986, no private well regulations existed to dictate construction requirements for private wells. Based on the dates of construction for the wells, there is potential that these existing wells do not meet current private well regulations. This cannot be verified through the limited available data, but it is likely that existing wells within the community, constructed prior to 1992, do not meet current construction standards. Furthermore, properties with no construction records cannot be verified to meet construction standards.

Overall, there was sufficient documentation of past instances where water quality and quantity were of concern, however; based on Online RME research, there was not strong evidence that water quality is a current issue for the majority of the community. Recent data also shows that at least one resident has significant issues with water quantity and is supplementing with outside sources. And approximately half of the community has wells with low yields based on health department reported well yields. Therefore, water quantity appears to be an ongoing issue among the Community. Due to the limited available health department records, a community survey was performed to provide additional data from residents regarding existing water systems.

3.1.3 Residence Existing Conditions Survey

A survey was distributed via email to owners of the 32 properties within the Unison community in March 2022. The purpose of the survey was to obtain feedback from the community regarding any issues experienced with individual water and sewage systems and to supplement existing system data. A total of 21 responses to the survey were received as of May 26, 2022 (66% response rate). It should be noted that citizen input was received from two surveys during the duration of the project. Between the two surveys, the water portion of the survey asked 18 questions. Thirteen (13) of these were quantitative questions, and five (5) were qualitative questions. Relevant responses are discussed in this section. The survey documents sent out and the full responses received can be found in **Appendix D**.

Eight (8) of the responses (25% of the entire community) answered "Yes" to the question, "Has there ever been a problem with the water quantity (yield), quality (bacteria, chemical, odor, etc.)?" One response indicated that both "quantity and quality are constant problems." Another respondent noted that it "would be nice to have public utilities." In describing the conditions of water in Unison, a respondent wrote that "the Unison water problem…has been known for decades."

Ten (10) respondents (approximately 31% of the entire community) indicated past or current issues and/or dissatisfaction with the quality of their water. Below lists key issues with water quality that were indicated in the survey responses:

- Four (4) responses listed iron as an issue with water quality.
- One (1) response wrote, "I do not drink my well water because of the high iron content and the smell. The high levels of iron in the water discolors all that it comes into contact with."
- One (1) response indicated that they are unable to drink their well water, as they wrote, "not drinkable. Heavy in minerals/hard water."
- One (1) response described their satisfaction with their water as "terrible" and explained, "we do not drink our water it stinks and is rusty even with all expenses & water treatment siphon."
- One (1) response listed that bacteria and sulfur have been issues.
- One (1) response mentioned an "egg smell."
- One (1) response described their water as "a little stinky hot water."
- One (1) response wrote, "at times the water contains fine silts that settle in the water buckets, dog bowls, etc. We only drink it after filtering."

It should be noted that thirteen (13) properties stated that they have an individual water treatment system and that three (3) properties have a UV system. The list below summarizes the purpose for some of these treatment systems based on survey responses:

- Three (3) of the responses stated that the water is treated for hardness.
- Two (2) responses detailed that the water is treated for iron/rust.
- Two (2) responses indicated that the water is treated for sediments.
- One (1) response specified that the water is treated for coliform bacteria.

Seven (7) respondents (approximately 22% of the entire community) indicated issues with well yield. Below lists key issues with water quantity that were indicated in the survey responses:

- One (1) respondent explained that two (2) of their wells were abandoned because they went dry. They explained that one (1) of these wells recently went dry in December 2021, and that they drilled a new well after this.
- One (1) respondent implied that their well currently runs dry.
- Two (2) respondents wrote that they supplement their water supply with a cistern
- One (1) of respondent trucks in water.
- One (1) respondent wrote, "We have ran out of water a couple times."
- One (1) respondent wrote, "Regarding well productivity—winter and spring are generally good. If

we have a summer drought, which has been happening often recently, the well stops. We have trucked in water far more in the last three years than in the previous 19 years."

- One (1) response expressed concern over the state of their water supply and the overall supply in Unison, as they wrote, "The well has a very low yield of 1.5 gallons per minute therefore I worry about running out of water and am very conservative with water use. I also worry about the overall use of water in Unison and drilling of any new wells that might tap into the same aquifer or deplete the ground water."
- One (1) response wrote, "The well only draws about a quart a minute and is easily taxed beyond its limits like all water sources in core of the Unison Village."

Overall, the survey responses provided evidence that residents in the Unison community face issues with both the quality of their water and well yield. Note that the percentages presented in this section are based out of the entire community and that only 66% of the community provided a response to the survey. Therefore, the actual percentage of community members that have experienced/are currently experiencing water issues may be higher.

3.1.4 Phase I Hydrogeologic Review

Emery & Garrett Groundwater Investigations (EGGI) conducted a Phase I Hydrogeologic review of available groundwater resources and summarized the findings in a technical memorandum, which can be found in **Appendix E**. The purpose of the review was to assess the potential availability of groundwater resources derived from bedrock aquifers underlying the Unison project site and to evaluate the feasibility of developing groundwater resources for a community public drinking water supply. For this evaluation, the Unison project site encompasses a 2,000-foot radius circle centered near the center of the village (approximately 0.45 square miles).

According to EGGI's evaluation, the bedrock beneath the Unison project site is made up of three (3) different rock units, which include a Pink metagranite, Layered granitic gneiss, and Metabasalt dikes, and these rock units are separated by the Short-Hill Fault.

Using an average recharge value of ten (10) inches per year to estimate available recharge within the project site, EGGI found that a minimum of 214,650 gallons per day (gpd), or 149 gpm of groundwater recharge is potentially available from the Unison project site, which is more than sufficient to support the required production capacity for Unison. It should be noted that the actual amount of groundwater recharge received by the local bedrock aquifer and the extent of pumping impacts will need to be determined through the hydrologic testing (pumping tests) of potential production wells.

EGGI reviewed potential sources of groundwater contamination. Drainfields are a potential source of groundwater contamination, especially in areas with small lot sizes, as nitrate leaching from closely spaced drainfields can cause elevated nitrate concentration. EGGI also identified two (2) additional sites with potential to cause groundwater contamination, a Leaking Underground Storage Tank and a leaking petroleum tank. Both of the site cases related to these sites have been closed, and the sites do not pose a risk to the community. Although, if new water sources are developed within the Community, the proximity to potential groundwater contamination should be considered. It should be noted that one (1) chemical storage tank was identified through Loudoun County GIS data.

In the 2000-feet project area, reported airlift yields from the GIS wells range from 0.5 to 50 gpm, with an average yield of 8.4 gpm. The well depths range from 100- to 1,000-feet, with an average depth is 525-feet. This shows that bedrock wells in the local area are deep and have very low to moderate yields. EGGI believes it will be essential to conduct geophysical surveys within the selected favorable areas to specifically identify where new groundwater supplies may be able to be developed in a sustainable manner.

As a result of the hydrogeologic assessment, EGGI identified three (3) potential Groundwater Development Zones, which are shown in **Figure 3-2** and identified as UNI-1, UNI-2, and UNI-3. According to EGGI, these Zones are considered the best candidate areas for developing potable groundwater resources for a community water system in Unison. These areas are priority ranked according to their overall hydrogeological favorability for yielding appreciable groundwater resources. Therefore, UNI-1 is considered more favorable for groundwater development than UNI-3.

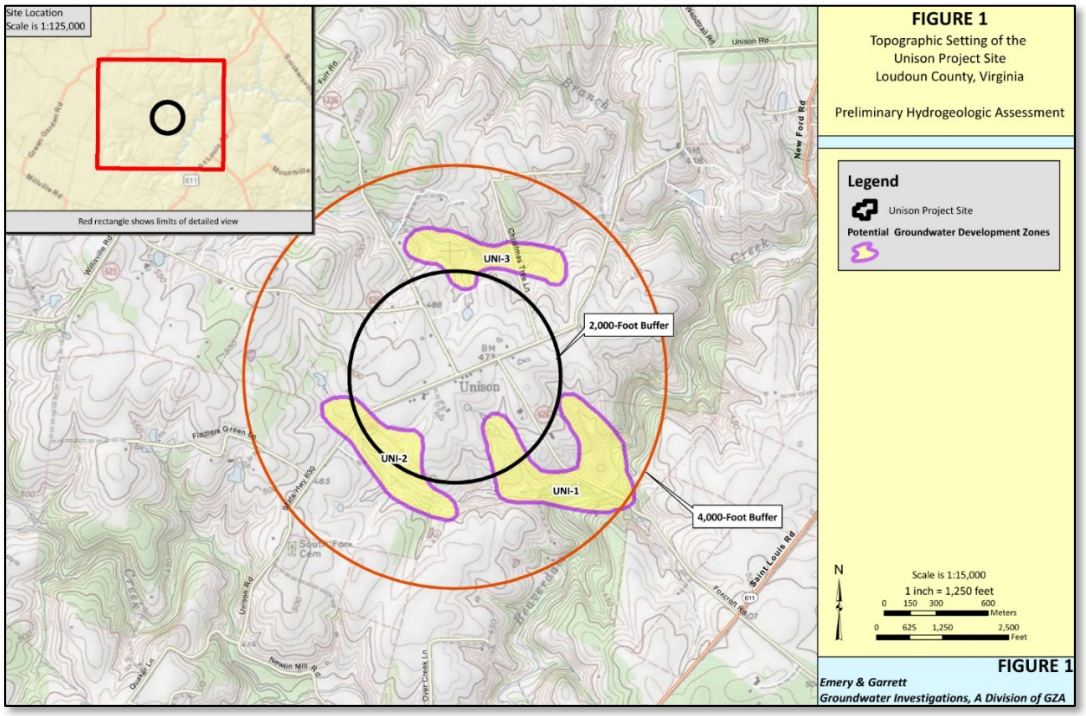

Figure 3-2 – Potential Groundwater Development Zones

Based upon the hydrogeologic data collected in Phase I, EGGI also recommends that the groundwater exploration program proceed to Phase II, which includes conducting geophysical surveys within the selected Groundwater Development Zones to aid in the selection of specific exploratory test well drilling targets/sites. The geophysical surveys should be conducted on selected land parcels where permission to gain access onto private or public property can be obtained and where it is technically feasible to conduct the surveys.

3.2 Current Estimated Water Demand & Potential Future Demand

A flow analysis technical memorandum (TM), which describes the process used to estimate current and potential future water demands within the Unison community, was developed and is included as **Appendix F**. Community demand and minimum yield requirements are dependent on the alternative selected

(community wells, municipal connection, etc.) and are based on existing community development and potential future community development. The requirements for individual systems differ from those of community systems or municipal connections. The results of the water demand analysis are summarized in **Table 3-1**.

Table 3-1 – Water Demand Estimates Summary

SCENARIO	WATER DEMAND
Existing Development	58 gpm
Potential Future Build-Out	61 gpm

As a result of the flow analysis, a community well system serving the existing development would require a well yield of 58 gallons per minute (gpm) with a potential future yield requirement of 61 gpm based on potential future buildout, which assumed the two (2) vacant parcels would be developed. Therefore, the recommended demand (for the study area) to be used for sizing of a community water distribution piping and well/treatment systems (as needed) for the Unison community is 61 gpm.

3.3 Overview of Water Alternatives

The technical feasibility of three (3) different alternatives were evaluated to improve water systems in Unison, which are listed and described below:

1. Upgrade Existing On-Site Systems
   Involves private property owners making individual improvements to their system by means such as hydraulic fracturing of rock (hydrofracking), construction of a new well or wells, or well deepening.
2. Communal Water Treatment Facility (Using a New Community Well)
   Consists of the construction of a community well system and associated treatment system for the entire community. This alternative would require that a minimum of two (2) wells be sited to meet the potential future demand of the community (61 gpm, or 1.8 gpm per connection).
3. Wholesale Purchase of Water from a Nearby Municipal System
   Involves connecting to a nearby municipal system with sufficient capacity to serve its residents and the community of Unison.

The following sections expand upon considerations for each alternative in more detail.

3.3.1 Alternative #1 – Upgrade Existing On-Site Systems

Based on the review of existing information described above, there are approximately eight (8) to 17 lots (approximately 25% to 53% of the existing community) that may need well improvements in Unison. This alternative would include repair and rehabilitation of the existing wells within the community, construction of new wells for non-compliant wells, or upgrades to wells that currently have deficiencies and/or poor

quality. Potential improvements to individual wells include hydraulic fracturing of rock (hydrofracking), drilling a new well, or well-deepening, which are further described below.

Hydrofracking involves injecting water under pressure to open or clean out existing rock fractures and thereby increase well yield, and typically takes one (1) day to complete. For hydrofracking, Loudoun County requires that potable water be used and LCHD recommends zone tracking. Hydrofracking cannot be performed in the top 120-feet of the well, and the upper packer, which acts as a seal between layers within a well, must be placed below the casing and grout zones. Loudoun County requires that the hydrofracking contractor be licensed by LCHD to install water supply systems. It should be noted that few contractors perform hydrofracking in Loudoun County and that details regarding hydrofracking procedures in Loudoun County are not well-documented. Although this is technically feasible, there has been limited documentation of success with hydrofracking in Loudoun County, and the feasibility of hydrofracking as a long-term solution (i.e., sustainability of yield increases) is still unknown. There is no guarantee that hydrofracking will be successful. Hydrofracking also poses risks to nearby wells. If the well that is being hydro-fracked is within the same fracture trend as a nearby well, there is potential for decreased well yield in the nearby well.

Another solution to improve yield on a private property is to drill an additional well or wells. However, due to setback requirements and other permitting and regulatory requirements, this option may not be feasible. An additional challenge for individual properties may be lack of access for necessary drilling equipment due to small parcel size and density of structures. **Figure *3-3*** illustrates the density of the existing wells, drainfields, and buildings within the Unison community along with minimum required setbacks for each. As shown in this figure, the majority of parcels within the community, particularly near the middle of the community do not have sufficient area to site new wells.

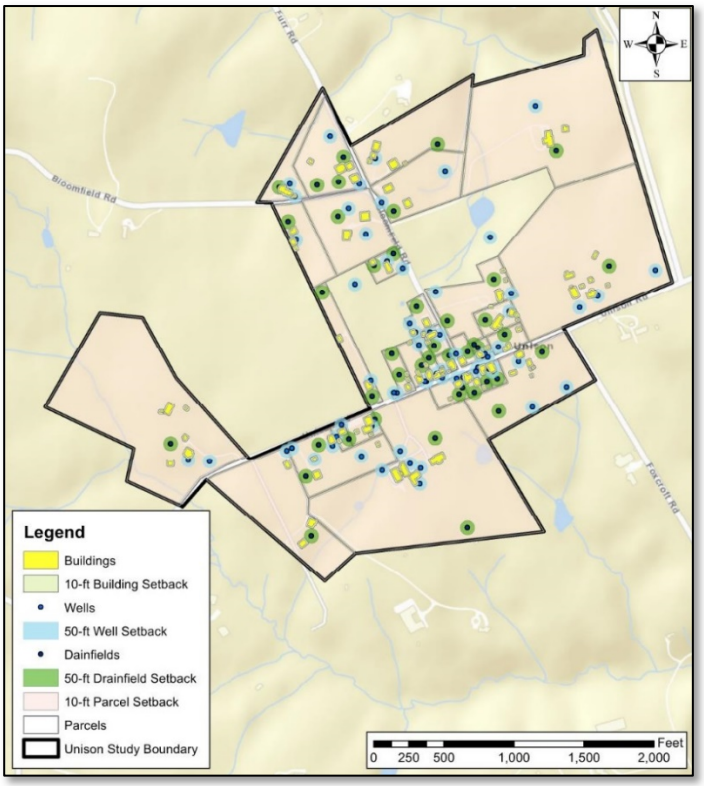

Figure 3-3 - Setback Requirements

A third solution is well deepening, which involves drilling in an existing well. Similar to hydrofracking, although this improvement is technically feasible, there is no guarantee that it will be successful, and the effectiveness of well deepening as a long-term solution (i.e., sustainability of yield increases) is uncertain.

Private property owners are entirely responsible for the costs of any improvements to existing private wells or the construction of new private wells. This alternative is considered technically feasible as wells could be hydrofracked or deepened, but it is not a viable alternative as well design requirements for new wells, specifically setbacks, will not be able to be met for the majority of the properties within Unison. As mentioned, there is potential for hydrofracking to address water demand issues, but this may not be an effective, long-term solution to meet individual water needs. Similarly, deepening existing wells is associated with uncertainty and may be able to meet the necessary water demand to serve residents.

For these reasons, this alternative is not being considered a viable solution for the community. Furthermore, due to the history of, and current ongoing issues associated with well yields in the area. It is likely that new private wells at similar depths to existing will also be susceptible to well yield issues.

3.3.2 Alternative #2 – Communal Water Treatment Facility (Using a New Community Well)

Assuming all existing and future developed lots will connect to the community water system, LW requires that groundwater systems serving 26 to 50 connections shall provide at least two (2) wells producing a combined total of 1.8 gpm per connection (which is approximately 58 gpm for 32 connections and 61 gpm for 34 connections), the smallest of which must produce a minimum of 0.6 gpm per connection.

The potential to achieve these requirements is uncertain, as actual sustainable groundwater extraction rates to support a community water supply system in Unison can only be determined by well drilling and testing. It should be noted that dry holes may be drilled in areas with statistically high yields, and vice versa, however; extreme high-yield wells are sometimes drilled by chance.

Community wells would be owned and operated by LW and would pump groundwater to a treatment facility. The facility would be designed to treat the raw groundwater to required standards prior to distribution. Prior to deciding the final treatment requirements, well development and testing would be completed to determine water quality. Each community well will need to be tested and monitored per the Virginia Waterworks Regulations (12-VAC-590). The water treatment technology will depend on the water quality of the well drilled. The VDH ODW provides primary and secondary Maximum Contaminant Levels (MCL) for several water quality measurements, some of which are summarized in **Table 3-2**.

Table 3-2 – Primary and Secondary MCLs for Water Quality

Primary	
Substance	**MCL (mg/L) VDH ODW**
Total Coliforms (including fecal coliform and E. Coli)	Positive repeat sample
Arsenic	0.01
Copper	1.3
Lead	0.015
Nitrate (measured as Nitrogen)	10
Secondary	
Substance	**MCL (mg/L) VDH ODW**
Chloride	250
Iron	0.3
Manganese	0.05
pH	6.5-8.5
Sulfate	250
TDS	500

Based on the results of the water quality tests, a small treatment facility may be necessary prior to the distribution system to convey treated water. These systems could range from simple disinfection to membrane treatment for contaminants. Water may be treated by conventional or direct filtration, slow sand filters, diatomaceous earth (DE) filters, or alternative filtration technology. Applying granular filtration removes turbidity and suspended solids. It will not remove any harmful bacteria. Alternative filtration, such as membrane filters, is capable of removing harmful bacteria in the water. Several additional common water treatment technologies which may be required are described below:

- Microfiltration Membranes: Microfiltration uses semi-permeable membranes with small pores to filter and remove bacteria, Giardia, and Cryptosporidium. This treatment technology reduces the amount of chlorine dosage needed for disinfection but is not effective in removing dissolved contaminates.
- Greensand Filtration: Greensand filtration uses filters made from glauconite greensand with a special coating of manganese oxide in order to oxidize iron and manganese. As the water flows through the greensand filter, these elements form solids that are filtered out of the water. The filters are capable of removing dissolved solids but are unable to remove bacteria.
- Activated Carbon Filters: Activated carbon filters are typically made of coconut shells, wood, or coal and are capable of removing organic contaminates, as they are effective for removing heavy metals such as copper, lead and mercury since these chemicals adsorb to the carbon. These filters are not able to remove dissolved solids, coliform, bacteria and arsenic.

Based on experience in the area and similar facilities in the region, the most common water quality issue that requires treatment is heavy metals, as iron and manganese are frequently detected in western Loudoun County groundwater above their Secondary MCLs. The most cost-effective approach to treat wells with heavy metals is the use of a manganese greensand filtration system. For the purposes of this feasibility study, it is assumed that there will be one (1) treatment system for all wells. Similar to the potential well locations, the treatment system may also be located outside of the study boundary.

This alternative would also require that a conveyance system be installed to distribute water from the treatment facility to individual homes. A conceptual water main layout for the potential community water system is shown in **Figure 3-4**. It should be noted that the layout was arranged to convey water from UNI-3, which is a potential Groundwater Development Zone that was identified by Emery & Garrett in the Phase I Hydrogeologic review completed for this study (see Section 3.1.3). It was assumed that UNI-3 would be utilized instead of UNI-1 or UNI-2 due to the conflict with the preferred conceptual layout for the community sewer system. Furthermore, a baseline assumption for the size of the distribution piping is 6-inch ductile iron pipe (DIP), as the LW EDM requires that raw water lines be 4-inch and larger for a community system and that the material be DIP.

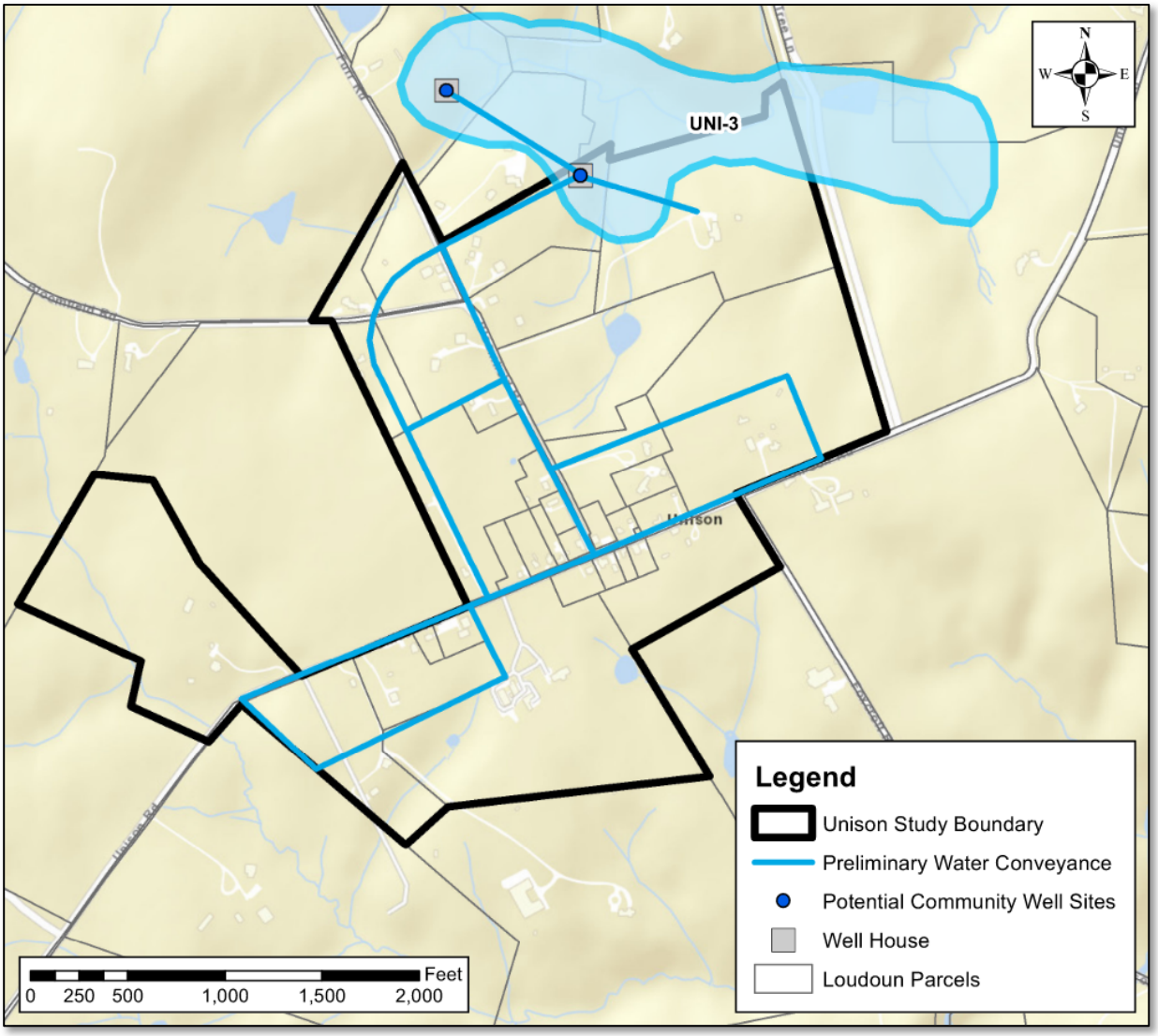

Figure 3-4 – Conceptual Water Main Layout

3.3.3 Alternative #3 – Wholesale Purchase of Water from, or Connection to, a Nearby Municipal System

The closest municipal water system to the Unison community is the Town of Middleburg, which is located approximately six (6) miles from Unison, as shown in **Figure 3-5**. The Town of Middleburg is served by five wells with a total current yield of 325 gpm. The water demand within the community is unknown and will require additional investigation to determine if there is sufficient capacity to also serve Unison.

Connection to this system would require sufficient well and treatment capacity to serve Unison. Additionally, a water main would need to be installed to convey potable water to the community. While technically feasible, connection to this municipality would not be practical, as this would require an extensive water main and supplemental support appurtenances, such as an intermediate or booster pump station. Construction of the water main would be challenging since it would run through approximately 6.5 miles of Fox Croft Road (Route 626). Therefore, this alternative is associated with the highest capital cost as detailed in Section 5.

Although technically feasible, the significant distance between Middleburg and Unison creates a substantial challenge for this alternative. The water main would likely require installation within existing roadways, which will require extensive traffic control and cause significant disruption to traffic.

Furthermore, there is concern with the age of the water once it reaches Unison due to the time it takes for water to travel the length of the main. Water age refers to the time it takes for water to travel from its treatment source to consumers. Excessive water age is a major factor in water quality deterioration. Some water quality problems associated with water age include disinfection by-product formation and biodegradation, disinfectant decay, and taste and odor. Decrease in water quality may lead to water that no longer meets water quality standards and/or be unpleasant to consumers. A water model would be required to determine water age and other water quality factors associated with this alternative.

Because Unison is located in the RPA, approvals through the Board of Supervisors would be required for connection. It should be noted that this alternative may not be practical due to the required capital costs and the requirement to obtain an agreement with the Town of Middleburg to provide water service outside of the Town boundary.

It should also be noted, if a new communal water system was to be developed in a nearby town or community, there is potential that Unison could connect to this system. The new water system could be designed and constructed to provide a community-to-community water system, serving both Unison and another nearby community. For example, if St. Louis were to construct a community water system, it could also be utilized to serve Unison. This alternative would require future evaluation should it become available.

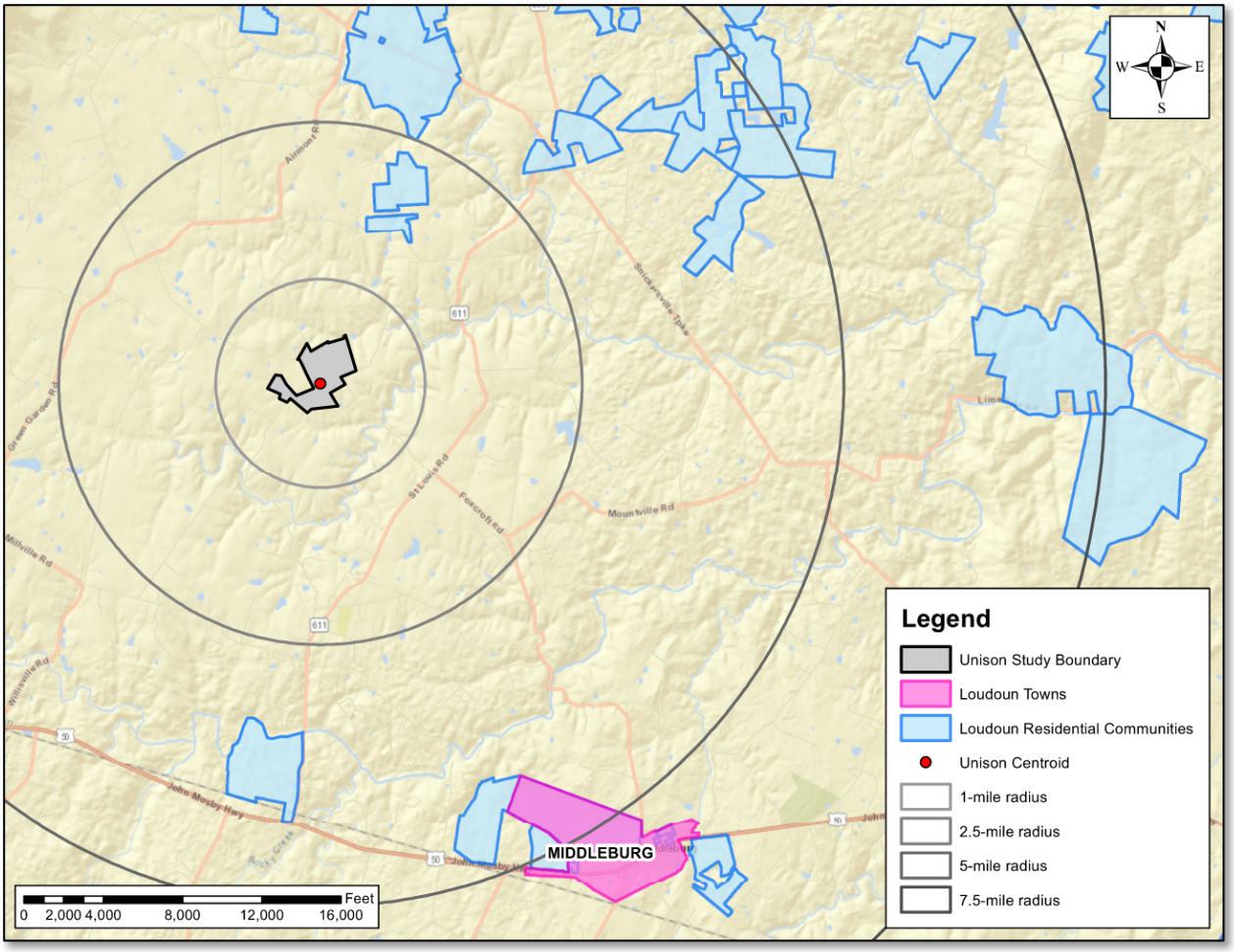

Figure 3-5 – Potential Neighboring Municipal Water System Connection at Middleburg

3.4 Alternatives Matrix & Water System Recommendation

A simple alternatives matrix was developed to analyze the three (3) potential alternatives relative to recommendation criteria. The purpose of the matrix is to better present and compare the alternatives, in order to recommend a water system. The options were considered based on the six (6) criteria listed below:

- Constructability
- Public Impacts
- Costs
- Approval/Acceptance
- Environmental Impacts
- Operations & Maintenance

It should be noted for the “Costs” criterion, financial responsibility for Alternatives #2 and #3 would be determined during subsequent analysis.

The criteria for each alternative were then rated on a scale from one (1) to five (5), with the larger number being more favorable, as shown in **Table 3-3**.

Table 3-3 – Scoring Breakdown

Rating Score	
5	Very Good
4	Good
3	Fair
2	Poor
1	Very Poor

The full matrix is included as **Table 3-4**. As a result of the analysis, it was determined that Alternative #2 (Community Water System Owned and Operated by Loudoun Water - Using New Community Wells) is the most favorable for further analysis to address the water system needs for the Unison community.

Alternative #2 includes the implementation of a water distribution and treatment system. Two (2) potential well sites, as shown in **Figure 3-4**, have been identified that may provide adequate yield to convey the estimated future demand of 61 gpm to Unison. It should be noted that no discussions took place with property owners regarding potential well sites. The well sites are shown conceptually for the purpose of this feasibility study and to show potential water infrastructure alignments. Per the preliminary layout shown in **Figure 3-4**, approximately 13,690 LF of 6-inch DIP is recommended to convey the water. Greensand filtration is the recommended treatment system due to the presumed presence of iron in the water. For the purposes of this feasibility study, it is also assumed that there will be one (1) treatment system for all wells. All well sites, piping and treatment system locations are shown preliminarily for conceptual purposes and some infrastructure may ultimately be located outside of the Unison study boundary.

Table 3-4 – Unison Water Alternatives Matrix

Unison Water Alternatives Matrix							
Alternative Number	**Constructability**	**Public Impacts**	**Costs**	**Approval/Acceptance**	**Environmental Impacts**	**Operations & Maintenance**	**Average Score**
Alternative 1 Upgrade Existing On-Site Systems to Improve Yield on Private Individual Wells	Many parcels within the community would likely face issues with new well construction based on parcel sizes and setback requirements.	Upgrade of existing systems not guaranteed to address issues with poor yield. Long-term effectiveness of hydrofracking unknown.	Upgrade of existing systems would have lower initial capital costs. Long term O&M costs would be the responsibility of the property owner.	Existing wells may need to be repaired or replaced. No need for additional land acquisition. Minor permitting approvals.	Water usage, potential contamination and potential impacts to nearby wells from hydrofracking (if used).	Continued homeowner O&M. Yearly inspections and upkeep.	**2.3**
Raw Score	**1**	**1**	**4**	**3**	**3**	**2**	
Alternative 2 Community Water System Owned and Operated by Loudoun Water (Using New Community Wells)	Requires new community well system and treatment facility. Extensive road restoration and community impacts for long construction durations. Need to construct in conjunction with wastewater improvements within roadway. Multiple conservation easements within project area could limit potential site alternatives for improvements.	Elimination of existing wells will provide more sustainable community solution. Public impacts during construction of distribution systems with road works and extended impacts.	High initial capital costs and connection fees.	Easements and land acquisitions necessary for well/treatment facility and distribution system. Conservation easements may restrict obtaining necessary easements. Extensive permitting due to historic nature of community.	Communal well would eliminate numerous old wells from community. Historic nature requires permitting, however, minimum environmental concerns.	New community system that will need O&M in accordance with VDH requirements. Ongoing water fees.	**3.0**
Raw Score	**3**	**4**	**2**	**1**	**4**	**4**	
Alternative 3 Wholesale Purchase of Water from, or Connection to, a Nearby Municipal System	No nearby municipal system within a reasonable distance for cost effective option. The nearest public water system is located in the Town of Middleburg over 6 miles away.	Public impacts during construction. Greatly reduce risk of ongoing public health impacts due to connection to system.	Highest initial capital costs and connection fees. Potential for existing water system upgrade fees.	Board of Supervisors and Town of Middleburg approval required. Easement and land acquisitions most likely necessary. Need to prove existing municipal system has capacity to provide additional water to Unison.	Potential stream and tributary impacts crossings required for distribution piping. Larger land disruption.	No additional treatment facility for maintenance. Potential for large water fees for residents to support operations and maintenance at Town of Middleburg municipal system.	**1.5**
Raw Score	**1**	**3**	**1**	**1**	**1**	**2**	

4.0 WASTEWATER SYSTEM EVALUATION

4.1 Preliminary Existing System Analysis

The sewage in Unison is currently being treated using on-site sewage disposal systems. According to Loudoun County GIS data, there have been approximately 43 individual private sewage systems installed in the Unison study boundary since the 1950's, as shown in **Figure 4-1**. Five (5) of these systems are classified as abandoned, and the existing systems include 31 conventional systems, six (6) alternative systems and one (1) pump and haul system. A summary of the types of systems at the existing community is as follows:

- Conventional On-Site Sewage Disposal Systems – A conventional on-site sewage disposal system consists of septic tanks with conveyance to a subsurface drainfield.
- Alternative On-Site Sewage (AOSS) Systems – The VDH defines an AOSS as "a treatment works that is not a conventional onsite sewage system and does not result in a point source discharge." Examples of these systems include dosing systems, mounds or fill systems, filters, low-pressure dispersal systems, and drip dispersal systems.
- Pump and Haul Systems – A pump and haul system consists of a septic tank where the sewage is pumped out when filled and hauled by a vehicle to a point of disposal.

The average age of the existing wastewater disposal systems within the community is approximately 40 years, and thirteen (13) systems are over 50 years old. Eight (8) of the on-site sewage disposal systems were installed after the year 2000.

This section reviews the Unison application, existing sewer system data – which have been evaluated from health department records – and citizen survey results.

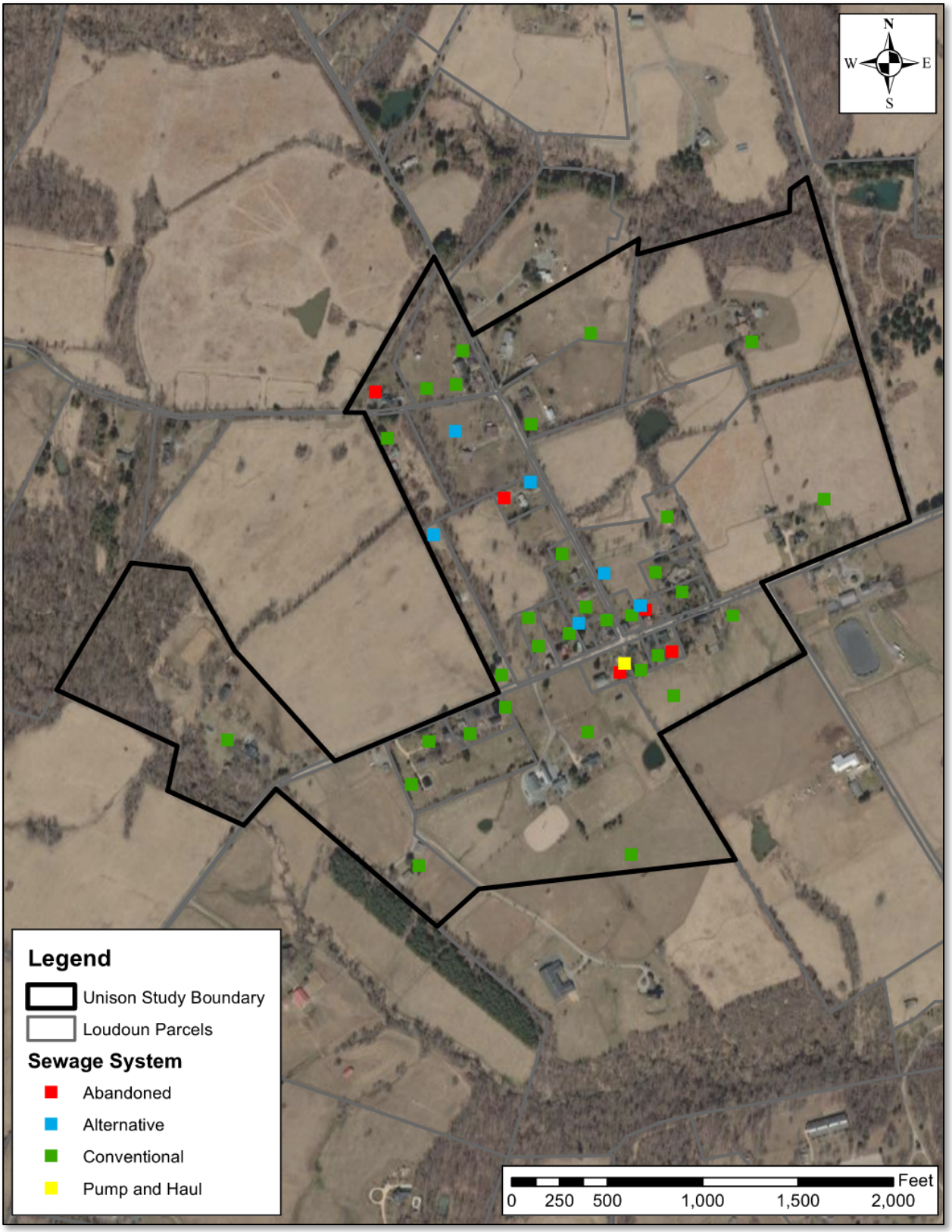

Figure 4-1 – Unison On-Site Sewage Systems

4.1.1 Unison Application

As previously stated, the community of Unison applied to The Program in 2020, and the community application is included as **Appendix B**. The application indicates that there are 32 individual septic systems within the community. The application describes the issues that the community faces with wastewater, as it states, “the area soil is also sub-par, resulting in many residents having to conduct costly maintenance on their drainfields or install alternative septic systems.” The application also explains that the majority of the community is in support of establishing a community wastewater system.

4.1.2 Additional Background: Loudoun County Water and Wastewater Needs Assessment

Prior to this feasibility study, Loudoun County completed a Water and Wastewater Needs Assessment in January of 2011. The purpose of this study was to identify water and wastewater issues within Loudoun County and propose potential approaches to the Board of Supervisors for pursuing further action. The assessment identified existing water and wastewater systems within Loudoun Water that are not served by Loudoun Water’s central system and issues with the existing systems. This assessment identified Unison as a community with existing unsatisfactory sewage systems based on a 1998 health department survey.

4.1.3 VDH and Health Department Data

As previously described, existing health department records were reviewed through the Online RME, and records were available for 33 out of 34 parcels within the Unison community. This section summarizes key findings of the research, and the full extent of research can be found in **Appendix C**. Note that the information presented in this section is not comprehensive.

Approximately 18% (6 out of 33 parcels) indicated evidence of past sewer problems, the earliest of which was reported in 1980 and the most recent in 2015. Past sewer problems include historic reports of malfunctioning septic tanks, groundwater intrusion into drainfields, complaints of odor, and complaints of sewage on the ground. Below are quotes from several different documents regarding these issues:

- From a Record of Complaint – “Commodes overflowing, sewage on the ground and bad odor”. (5/23/1980)
- From an assessment – "When the septic tank cleaner attempted to pump the tank, a mixture of sewage effluent and groundwater entered the tank from the drainfield area. This indicates that soil in which the drainfield was installed is saturated and may be impeding proper operation of the septic system". The assessment goes on to say this issue may lead to slow flushing toilets, slow draining sinks and tubs, and possible backups into the house during soil saturation periods. (1/28/1988)
- A later assessment noted that the sewer line from house to septic tank is at minimal grade and the "drainfield appears to be uphill of the septic tank". (3/9/1988)
- From a Record of Complaint – "Effluent was observed from the drainfield system ponding on the ground surface” and "All attempts to modify and/or repair the existing drainfield have failed". The complaint also notes that "this property has a history of problems with sewage disposal system". (2/24/1992)
- From an assessment – "Sewage observed surfacing on the ground. After probing the ditches, they appeared to be saturated all the way to the ends of each ditch. A new drainfield is required to

alleviate the health hazard." (2/8/2012)

- From a letter dated 1/13/15 – "The structure currently has an approved emergency pump and haul system…issued on August 5, 2014 and installed to correct an existing failing drainfield (now abandoned and decommissioned). No viable on-site repair options exist at this time. Numerous well across Unison Road would have to be abandoned, if allowed by the various landowners, to obtain suitable area for an alternative system to be permitted and installed. No other option for sewage disposal could be determined other than permanent pump and haul to serve the structure. Sewer is not available in the Village of Unison."

In addition to a history of sewer problems, there are four (4) parcels within the Community that currently have drainfields located within easements on adjacent parcels. For all properties, these easements were a last resort for onsite sewage disposal and were obtained to replace a failing onsite sewage treatment system. Each property has a history of back-and-forth communication with the health department, including denials for replacement of existing drainfield or installation of a new drainfield on the primary user's parcel. These denials are due to lack of adequate soil or area (including required setbacks) to site a new drainfield on the primary user's parcel. Therefore, to meet their disposal system needs, these parcels were left with no choice but to contact adjacent property owners to conduct drain field siting investigation on their property and request subsequent approval to obtain an easement to site a drainfield.

Drainfields & Reserves: In review of health department data, the current drainfields, reserve drainfields, and available area on existing parcels to potentially site future drainfields were considered. Per the Sewage Handling and Disposal Regulations and Chapter 1066 of the Loudoun County Code, a 100% reserve drainfield area is required for new onsite disposal systems. Preliminary review of available data showed that fifteen (15) parcels, nearly half of the Unison Community, do not currently have sufficient area for a reserve drainfield. This number is estimated based on review of existing features, approximate review of setbacks, and existing drainfield location and health department data (including existing drainfield size). These parcels are limited by their size, setback requirements, and existing soil conditions. Therefore, if the existing drainfield on these parcels fail, the property owner will not be able to install a new drainfield on their property. This will limit the options for onsite sewage disposal for these homeowners, forcing them to turn to alternative methods, such as obtaining easements on adjacent properties or installing systems not approved by the health department.

System Age: As noted above, the average age of the existing wastewater disposal systems within the community is approximately 40 years, and thirteen (13) systems are over 50 years old. Per the Environmental Protection Agency (EPA) *Onsite Wastewater Treatment Systems Manual* (2002), the typical life span of a conventional on-site sewage system is 20 to 30 years. The system's life may vary depending on maintenance and system use. Twenty-three (23) of the existing wastewater systems within the community exceed the upper end of this guidance.

Overall, there was robust documentation of past instances of sewage disposal issues. There was strong evidence that one (1) property currently faces a major issue with their sewage disposal system, as the property must use a pump and haul system. It should be noted that pump and haul operations are permitted in the RPA only as a last resort and a temporary method to address a proven public health emergency.

4.1.4 Residence Existing Conditions Survey

As previously described, a survey was distributed via email to owners of the 32 properties within the Unison community in March 2022. It should be noted that citizen input was received from two surveys during the duration of the project. Between the two surveys, the wastewater portion of the survey asked 25 questions. Nineteen (19) of these were quantitative questions, and six (6) were qualitative questions. Relevant responses are discussed in this section. The survey documents sent out and the full responses received can be found in **Appendix D**.

The responses confirmed the general distribution of existing types of on-site sewage disposal systems in Unison, with most of the responses (16 total) having a conventional system, four (4) responses having an alternative system and one (1) response having a pump and haul system. Most of these systems have been pumped out in the previous few years, while the pump and haul system is pumped out "about every 30 days at $275."

Four (4) of the responses (13% of the entire community) answered "Yes" to the question, "Are you aware of any sewage disposal system repairs, sewage on the ground or backups in the house?" Two (2) of these responses explained that the part of the system was replaced, and two (2) of these responses noted that backups had occurred after heavy rain events. One (1) survey responder answered "Yes" to having been aware of standing water and foul odors near or on their drainfield and explained that this happens during the same weather conditions that cause backups.

Overall, the survey provided evidence that a few members of the Unison community have faced or occasionally face issues with their sewage disposal systems, especially during heavy rain events. As previously noted, the percentages presented in this section are based out of the entire community, and only 66% of the community provided a response to the survey. Therefore, the actual percentage of community members that have experienced/are currently experiencing wastewater issues may be higher.

4.2 Current Estimated Sewage Flow & Potential Future Flows

The flow analysis technical memorandum (TM), which is included as **Appendix F**, also describes the process used to estimate current and potential future sewage flows within the Unison community. The results of the sewage flow analysis are summarized in **Table 4-1**.

Table 4-1 – Sewage Flow Estimates Summary

SCENARIO	SEWAGE FLOW
Existing Development	20 gpm
Potential Future Build-Out	21 gpm

As a result of the flow analysis, a community wastewater system serving the existing development would be required to handle sewage flows of 20 gpm with a potential future sewage flows of 21 gpm based on potential future buildout, which assumed the two (2) vacant parcels would be developed. Therefore, the recommended sewage flow (for the study area) to be used for sizing of a community sewage distribution piping, drainfield areas and treatment systems (as needed) for the Unison community is 21 gpm.

4.3 Soil Investigation

Dewberry completed a soil analysis TM, which discusses results of the soil investigations conducted by Dewberry and Marsh & Legge Land Surveyor, P.L.C. (Marsh & Legge) and is included as **Appendix G**. This section summarizes the analysis completed and key findings.

Dewberry conducted a preliminary review of soils within the Unison community using available Loudoun County GIS data. As a result of this review, Dewberry selected the seven (7) parcels listed in **Table 4-2** for further analysis. Dewberry contracted Marsh & Legge Land Surveyor, P.L.C. to further investigate these seven (7) parcels, with the purpose of identifying potential community drainfield sites.

Table 4-2 – Parcels Selected for Further Analysis

PARCEL NUMBER[1]	PARCEL ID	PARCEL SIZE (ACRES)	DISTANCE FROM UNISON (MILES)[2]
1	618101628000	25	0.28
2	618306814000	21.849	0.37
3	618174821000	45.607	0.49
4	640496940000	268.369	1.43
5	593163665000	97.3	0.68
6	619486952000	52.099	0.64
7	619360718000	158.49	1.42

[1]Parcel numbers were generated by Dewberry and serve no purpose other than identification

[2]From intersection of Bloomfield Rd and Unison Rd (near center of Unison study boundary) to outermost edge of parcel boundary

Marsh & Legge determined the required primary drainfield area to be 161,850 square feet, which is approximately four (4) acres. In addition to the primary drainfield area, a 100% reserve drainfield site is also required per the Sewage Handling and Disposal Regulations and Chapter 1066 of the Loudoun County Code. The reserve drainfield would not be installed, but is required to be preserved as a secondary drainfield site in the event that the installed primary drainfield fails. No driveways, permanent structures, underground utilities, or any other physical disturbances are allowed to be sited in this area. The total area required for both the primary drainfield and reserve drainfield is approximately eight (8) acres. **Figure 4-2** displays the available drainfield areas on each of the parcels.

In addition to the required drainfield area discussed above, a nitrogen dilution buffer area will also be required to surround the proposed drainfield site. According to the Commonwealth of Virginia Statute 12VAC5-613-90B for large AOSSs that treat greater than 10,000 gpd, it must be demonstrated that the TN concentration in the effluent sewage leaving the wastewater treatment plant (WWTP) prior to distribution to the primary drainfield (surrounded by a dilution area) is less than or equal to 8 mg/L. Furthermore, TN concentration in the groundwater cannot exceed 5 mg/L at the project boundary, which is defined by the edge of the nitrogen dilution area. Alternatively, it must be demonstrated through in situ monitoring within 24 inches of the point of effluent application in the soil that the TN concentration is less than or equal to 5 mg/L. For the purposes of this study, it was assumed that the treatment technology selected will be capable of treating the effluent sewage to 8 mg/L and that a nitrogen dilution area will be required to meet 5 mg/L TN concentration at the project boundary. Based on this assumption, and utilizing The VDH GMP 1995-02, the estimated land requirement for the dilution area was calculated to be approximately 12.5 acres. Detailed limitations of this area may be assessed in future studies.

It should be noted that the primary drainfield area (and consequently the reserve drainfield area) size was calculated by Marsh & Legge assuming treatment level 2 (TL-2) requirements for the five-day biochemical oxygen demand (BOD5) and total suspended solids (TSS), as outlined in the Commonwealth of Virginia Statute 12VAC5-613-10. This conservative assumption ensures that the parcel will have adequate acreage for both the primary drainfield area and reserve drainfield area. However, it can reasonably be assumed that the wastewater could be treated to the more stringent treatment level 3 (TL-3) BOD and TSS requirements and a smaller drainfield could be sited. **Table 4-3** details the total approximate estimated land required, which includes the primary drainfield area, reserve drainfield area, dilution area and WWTP area (assumed to be 0.5 acres) for both TL-2 and TL-3.

Table 4-3 – Estimated Land Requirements

TREATMENT LEVEL	PRIMARY DRAINFIELD AREA (ACRES)	RESERVE DRAINFIELD AREA (ACRES)	NITROGEN DILUTION AREA (ACRES)	WWTP AREA (ACRES)	TOTAL LAND REQUIRED (ACRES)
TL-2	4	4	12.5	0.5	21
TL-3	3	3	12.5	0.5	19

As a result of the soil analysis summarized above and in **Appendix G**, the following three (3) options could potentially be utilized for drainfield sites:

- Parcel Number 4
- Parcel Number 5
- Combination – Portion of Parcel Number 4 & 7

Parcel numbers 4 and 7 have both a Conservation Easement and Virginia Outdoors Foundation Easement. Additional study of the easement language will be required to determine the limitations on these properties. It should be noted that this information is preliminary and may change with a detailed soil evaluation and site analysis.

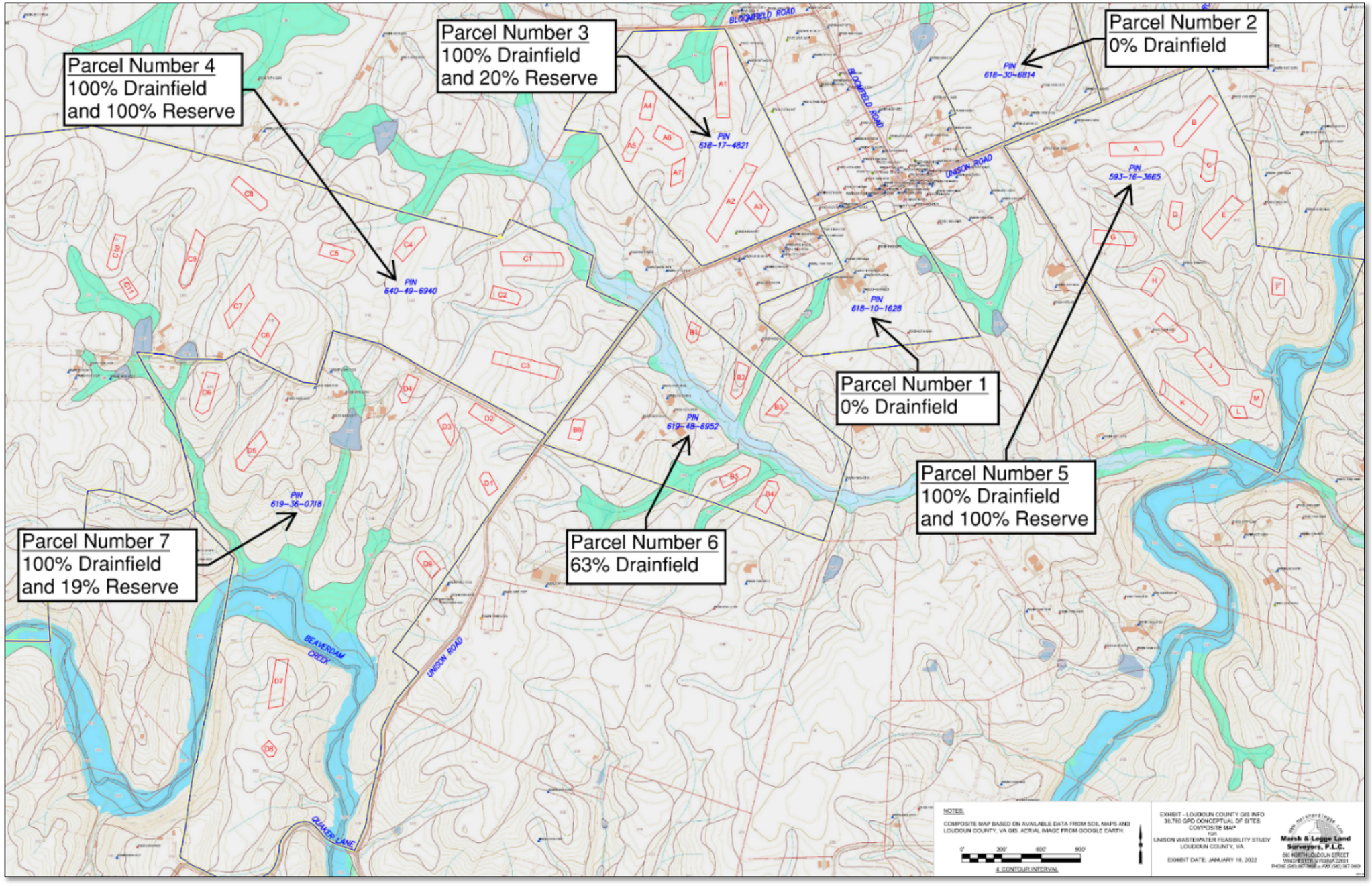

Figure 4-2 – Potential Drainfield Areas

4.4 Overview of Wastewater Alternatives

The technical feasibility of four (4) different alternatives were evaluated to improve wastewater systems in Unison, which are listed and described below:

1. Upgrade Existing On-Site Systems

   Involves private property owners making individual improvements to their system by means such as replacements or repairs.

2. Subsurface Discharging Wastewater Treatment Facility

   Consists of the construction of a 4-acre drainfield (with 4-acres of reserve area and 12.5-acre nitrogen dilution area), 0.5-acre WWTP facility and conveyance for the entire community.

3. Surface Water Discharging Wastewater Treatment Facility (with Potential Discharge into Beaverdam Creek)

   Consists of the construction of a community wastewater system, with an associated treatment system and conveyance for the entire community.

4. Conveyance and Pump Station Connection to a Nearby St. Louis Community System

   Involves connecting to the nearby St. Louis community wastewater system, either directly into the existing WWTP or into the existing gravity sewer.

The following sections expand upon considerations for each alternative in more detail.

4.4.1 Alternative #1 – Upgrade Existing On-Site Systems

Based on the average age of the existing systems and the limited lot sizes and areas, it is not feasible to upgrade existing systems for every parcel to meet current standards and provide a more robust wastewater collection and treatment system. As shown in Figure 3-3 and summarized in the health department data, the majority of parcels within the community do not have sufficient area to site a new primary and reserve drainfield on their property, while also meeting requirements such as setbacks. Additionally, there is currently one (1) pump and haul system in the community. It should be noted that pump and haul operations are permitted in the RPA only as a last resort and a temporary method to address a proven public health emergency.

4.4.2 Alternative #2 – Subsurface Discharging Wastewater Treatment Facility (Communal Drainfield)

A wastewater treatment facility with subsurface discharge can be utilized. This would require construction of drainfield areas and a wastewater treatment facility in the vicinity of Unison.

The primary challenge with this alternative is the acquisition of property to construct the necessary facility and drainfield. As previously discussed in Section 4.3, the total land area required for this alternative is approximately 21 acres for TL-2 requirements and 19 acres for TL-3 requirements. This includes a drainfield area of 3 to 4 acres (and a reserve drainfield area of the same size), a dilution area of 12.5 acres and a WWTP area of 0.5 acres. The WWTP would be constructed adjacent to a drainfield and would need to treat the potential future sewage flows (30,750 gpd).

There are numerous treatment technologies that could be installed for Unison that can meet 8 mg/L effluent limits. These technologies include extended aeration systems, activated sludge treatment, membrane bioreactors (MBR) or sequencing batch reactors (SBR). Due to the capacity and treatment levels required for this system, fixed film systems are not recommended. Fixed film systems pose challenges with operator flexibility and meeting more stringent effluent limitations, leading to the inability to meet permit requirements.

Treatment technologies that can meet TN effluent limits of less than 8 mg/L or 5 mg/L provide additional benefit by reducing the nitrogen dilution area requirements. In order to provide a conservative estimate, this study assumes the installation of an MBR treatment system which has the highest initial capital cost. There are several manufacturers that provide this technology and can meet 8 mg/L TN effluent limits. During design, the appropriate treatment system will be confirmed.

In addition to the treatment facility, monitoring wells will also be installed to sample groundwater surrounding the drainfields for contamination and to verify dilution is occurring. For a system of this size, it is recommended that a minimum of three (3) monitoring wells be installed. One (1) monitoring well should be placed upstream of the drainfields for baseline purposes and one (1) monitoring well each would be placed downstream of the primary and the reserve drainfields.

Three (3) figures were developed to show potential conveyance systems for this alternative. **Figure 4-3** and **Figure 4-4** assume that the WWTP (and therefore the drainfield) will be located Southeast of the community. The Southeast WWTP can be served by a combination system (gravity and low-pressure) or a low-pressure system. **Figure 4-5** assumes that the WWTP (and therefore the drainfield) will be located Southwest of the community. The Southwest WWTP can only be served by a low-pressure system.

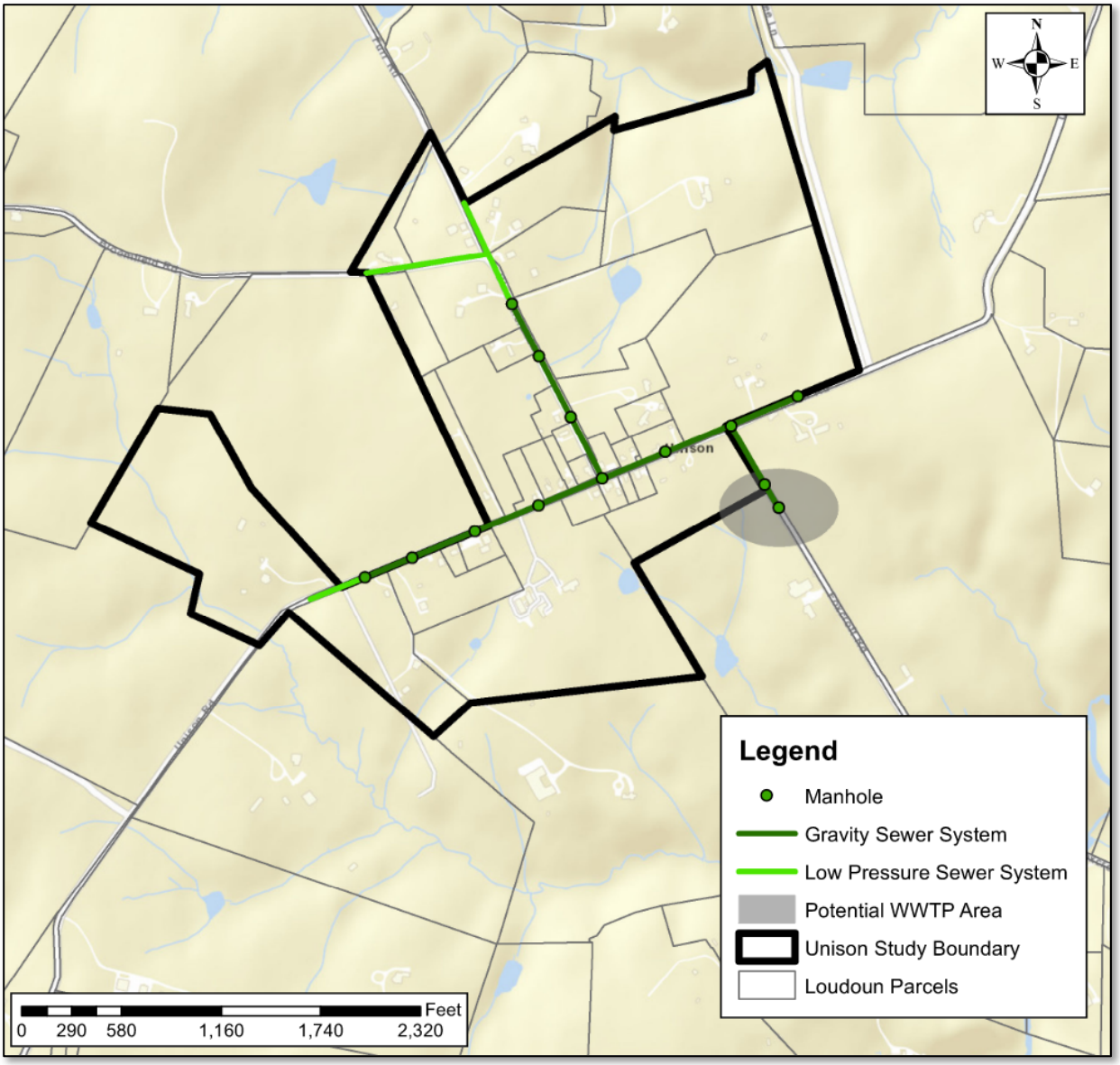

Figure 4-3 – Alternative #2 Conceptual Combination System Layout with Southeast WWTP and Drainfield Location

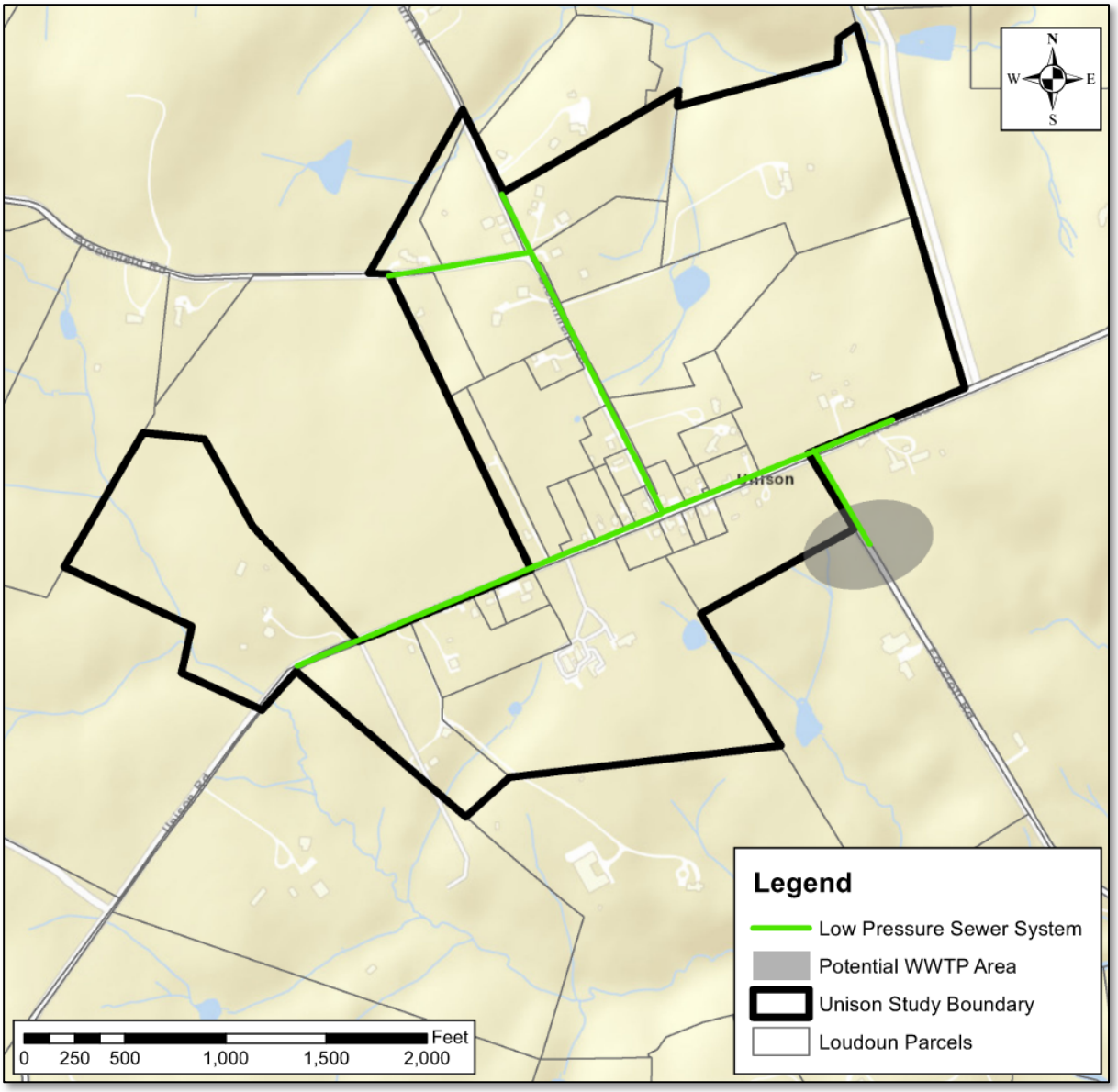

Figure 4-4 – Alternative #2 Conceptual Low Pressure System Layout with Southeast WWTP and Drainfield Location

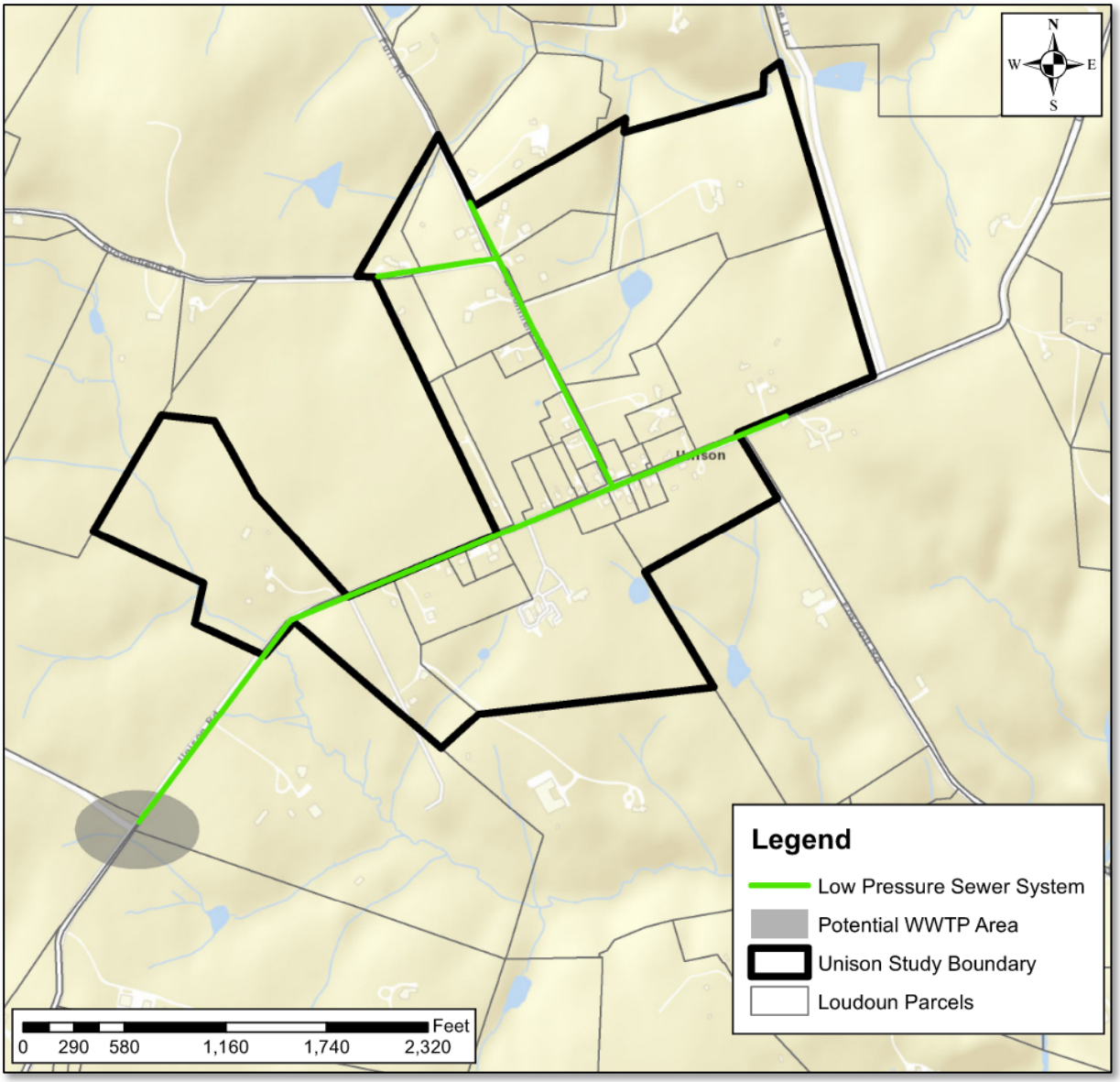

Figure 4-5 – Alternative #2 Conceptual Low Pressure System Layout with Southwest WWTP and Drainfield Location

4.4.3 Alternative #3 – Surface Water Discharging Wastewater Treatment Facility (with Potential Discharge into Beaverdam Creek)

This alternative would require construction of a WWTP in or around Unison. Treated effluent from the WWTP would be discharged into the Beaverdam Creek, which is considered to be a perennial stream. **Figure 4-6** identifies three (3) potential discharge locations along the creek, which are located North, Southeast and Southwest of the Unison study boundary. The location of the effluent pipe would need to be determined in the preliminary stages of design and coordinated through VDEQ. An effluent pump station and force main may be required to convey treated effluent to an approved discharge location.

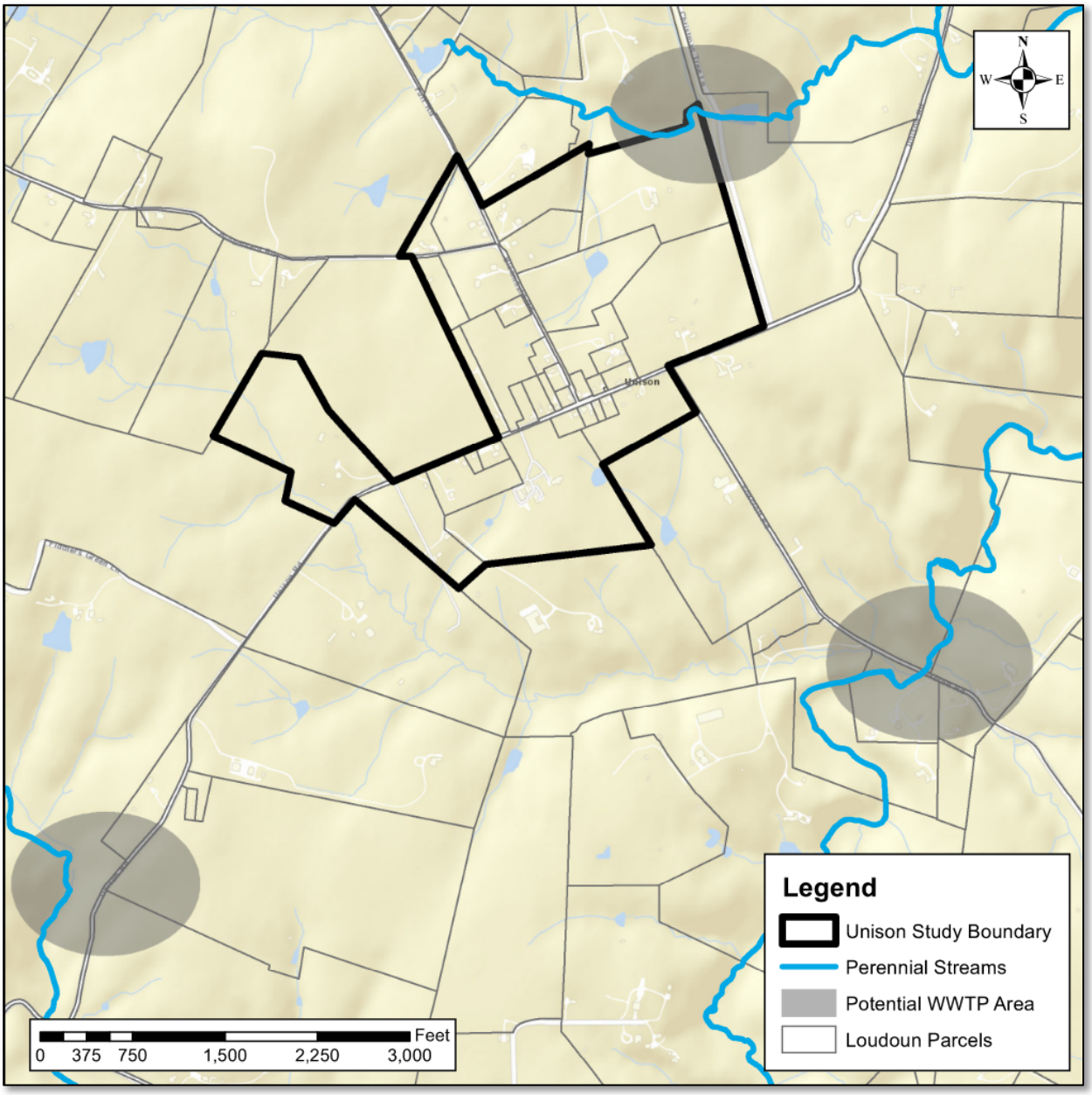

Figure 4-6 – Potential Discharge Locations to Beaverdam Creek

Beaverdam Creek is considered to be an impaired stream by the Virginia Department of Environmental Quality. This classification means that special authorization would be required to discharge treated effluent into the creek. The impaired stream will require adherence to strict permit conditions and will entail acquisition of nutrient credits in order to be approved for discharge into the Chesapeake Bay watershed. The treatment system required for this alternative would be required to meet advanced effluent discharge requirements.

In adhering to an Environmental Protection Agency (EPA) federal mandate, nutrient loading into the Chesapeake Bay is highly regulated. In response to this mandate, the Commonwealth of Virginia enacted a nutrient credit program to provide "credits" for effluent discharge into the Chesapeake Bay drainage area. These credits are used by municipalities, utilities and private owners to allow discharge of effluent into these areas and prevent excess nutrient loading. Both nitrogen and phosphorus credits would be required to be obtained. There are currently no credits available for purchase from the State of Virginia. Existing credits can be purchased or leased for a period of time from three (3) to five (5) years within Virginia. However, current regulations do not allow new dischargers to purchase credits directly. Alternatively, credits may be purchased from an individual authority, such as the Town of Leesburg, if they hold credits not being utilized.

Based on discussions with DEQ, nitrogen credits can be exchanged, or obtained, through the permitting process by accounting for the elimination of septic systems throughout the Community. Credit tradeoff is not one-for-one, meaning that the community will not meet the nitrogen credit requirements solely through the elimination of septic systems. Therefore, credits would need to be purchased for total nitrogen being discharged. However, phosphorous credits cannot be obtained through the elimination of septic systems. Therefore, phosphorous credits would need to be purchased through the credit exchange program. In either case, it is likely that nutrient credits will be required for both TN and TP to fully meet required effluent limits.

Due to these strict regulations regarding nutrient loading, optimum design of the facility includes development of a treatment process that minimizes levels of nitrogen and phosphorus in the effluent. Nitrogen can be biologically removed through the nitrogen cycle as nitrogen gas and not discharged through the effluent, whereas phosphorous is mainly removed physically through sludge. Therefore, the more significant challenge in treatment is phosphorous removal. However, no current treatment process eliminates 100% of either nitrogen or phosphorous. Therefore, as mentioned above, nutrient credits will need to be acquired for both nitrogen and phosphorous. The number of credits required will be dependent on the nutrient levels in the effluent after treatment.

The following general groups of treatment technology systems could be considered for a surface discharge system:

- **Conventional treatment** (i.e. extended aeration, sequencing batch reactors, etc…) – conventional treatment technologies are often used to meet secondary treatment effluent limits as defined by DEQ. Conventional treatment is typically a biological process suitable for relatively high nitrogen effluent limits that removes total suspended solids and total nitrogen. These systems are very cost effective to construct and operate. However, these treatment alternatives may not meet effluent requirements, specifically for phosphorous.

- **Bioreactors** (i.e. fixed film bioreactors, moving bed biofilm reactors, etc…) – bioreactor systems use media to intensify biological activity in tanks to meet more stringent total nitrogen effluent limits. These systems are capable of meeting very low nitrogen limits, however, due to the nature of the media systems, do not provide levels of phosphorous removal necessary for a surface effluent facility in the Chesapeake Bay. Bioreactors are not recommended for further consideration.

- **Advanced Filtration Systems** (i.e. membrane treatment systems, ultrafiltration systems, etc…) – advanced filtration systems use biological treatment systems followed by pressure filters to treat wastewater and meet stringent effluent limits. They are capable of meeting State-of-the-art (SOA) effluent limits or better and are considered to be best available technologies for systems of this scale. The micro and ultrafiltration systems provide best in class nitrogen and phosphorous reduction. The initial capital cost and long-term operating costs of these systems are the highest due to the complexity of these systems.

As outlined above, there is no available treatment system that will eliminate phosphorous from the effluent or capable of treating nitrogen to eliminate the need for credits, which will be the critical factor in siting and obtaining a discharge permit, meaning both nitrogen phosphorous credits will be required. However, conventional treatment, such as sequencing batch reactors, or advanced filtration systems could be considered for treatment systems to serve the community. For the purposes of this study, it is being assumed that an SBR would be utilized should a surface discharge system installed.

Additionally, for the purposes of this study, it was assumed that the WWTP and surface discharge point would be located in the Southeast discharge area. The conceptual conveyance layout for this alternative is shown in **Figure 4-7**.

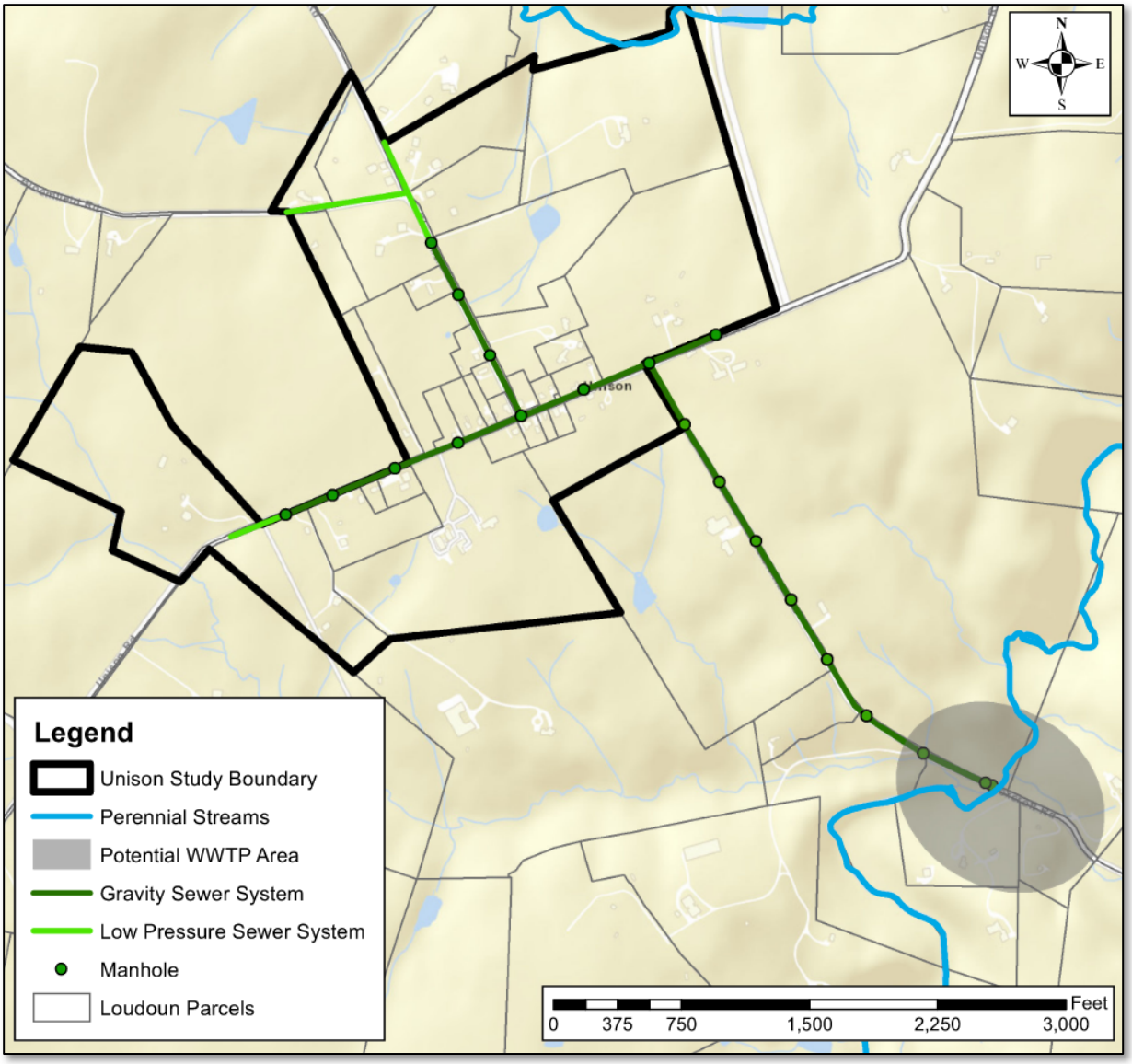

Figure 4-7 – Conceptual Surface Discharge Layout

4.4.4 Alternative #4 – Conveyance and Pump Station Connection to a Nearby St. Louis Community System

Following roadways, St. Louis is approximately 2.4 to 3.4 miles south of Unison. **Figure 4-8** shows two (2) potential layouts from Unison to St. Louis, with one (1) layout traveling Southwest and connecting directly into the St. Louis WWTP and the other layout traveling Southeast and connecting directly into the St. Louis gravity sewer. **Figure 4-9** and **Figure 4-10** show the elevation profiles for each of these conveyance layouts. Due to the topography of the land, a pump station will be needed for both conveyance layouts.

Since Unison is zoned in the RPA, any connection to an existing system would require approval from the Loudoun County Board of Supervisors. Additionally, the capacity of the existing system must be considered. Loudoun Water conveyed that a flow study, completed in 2019, showed that the St. Louis WWTP currently

receives approximately 12,000 gpd, despite the plant having a permit for 86,000 gpd. Therefore, it is assumed that the St. Louis WWTP has sufficient capacity to handle estimated potential future flows from Unison (30,750 gpd). However, if the connection to the St. Louis system is made via gravity sewer, gravity improvements may be needed. Furthermore, an odor control facility may potentially be required at the St. Louis WWTP or prior to the discharge into the St. Louis gravity system depending on the layout.

It should be noted that Loudoun Water is currently in the preliminary stages of design for upgrades to the St. Louis Wastewater Treatment Plant. This work will include a new sequencing batch reactor (SBR) system. There are no planned changes to system capacity at this time. With this work, additional upgrades or provisions can also be made to allow for the system to eventually accept the Unison flows.

Although this alternative is technically feasible, it is associated with the highest cost due to the extensive conveyance length, the necessity of a pump station and the potential improvements needed for the St. Louis system (such as an odor control facility).

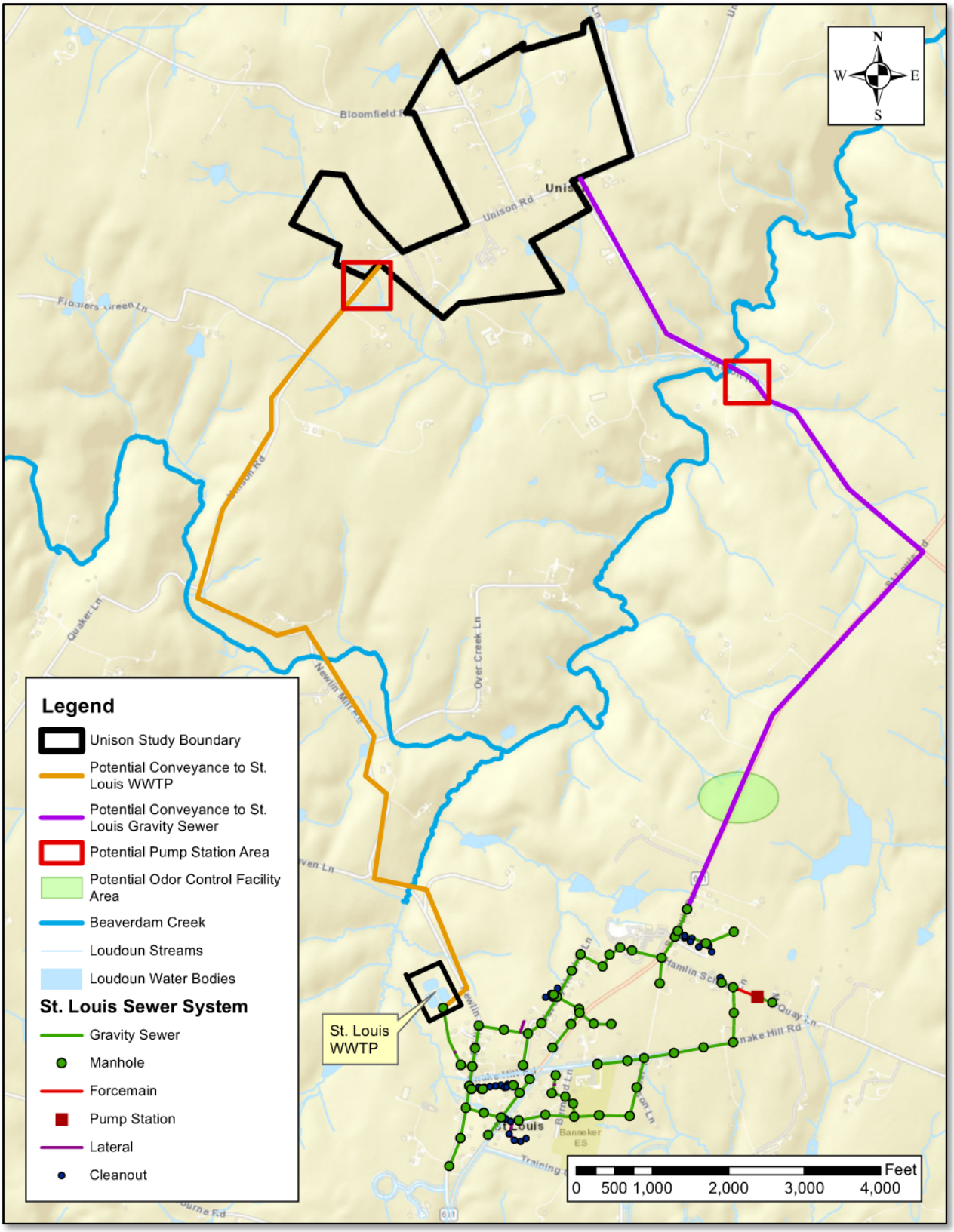

Figure 4-8 – Conceptual Layout to St. Louis WWTP

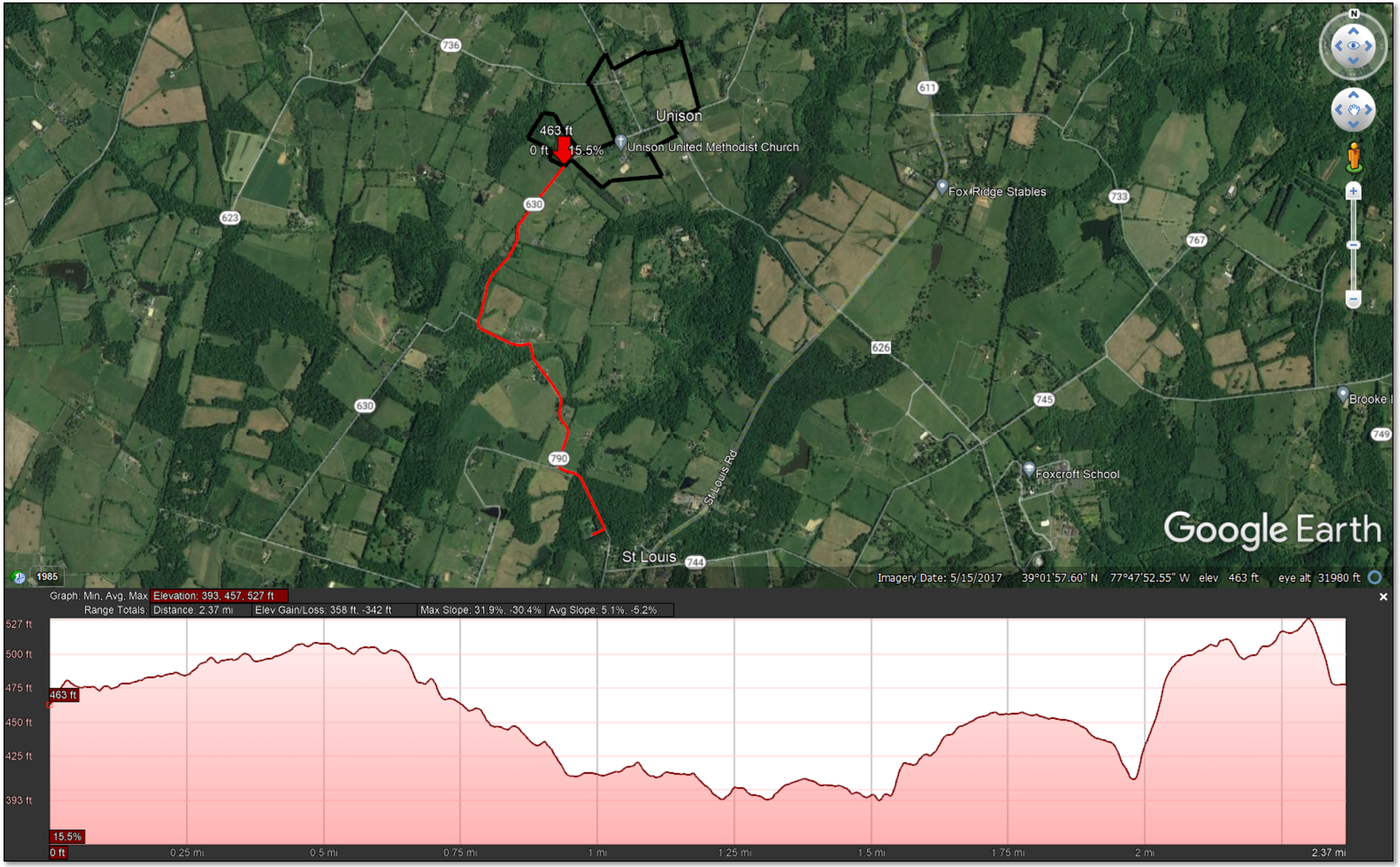

Figure 4-9 – Elevation Profile for Conceptual Layout Directly to St. Louis WWTP

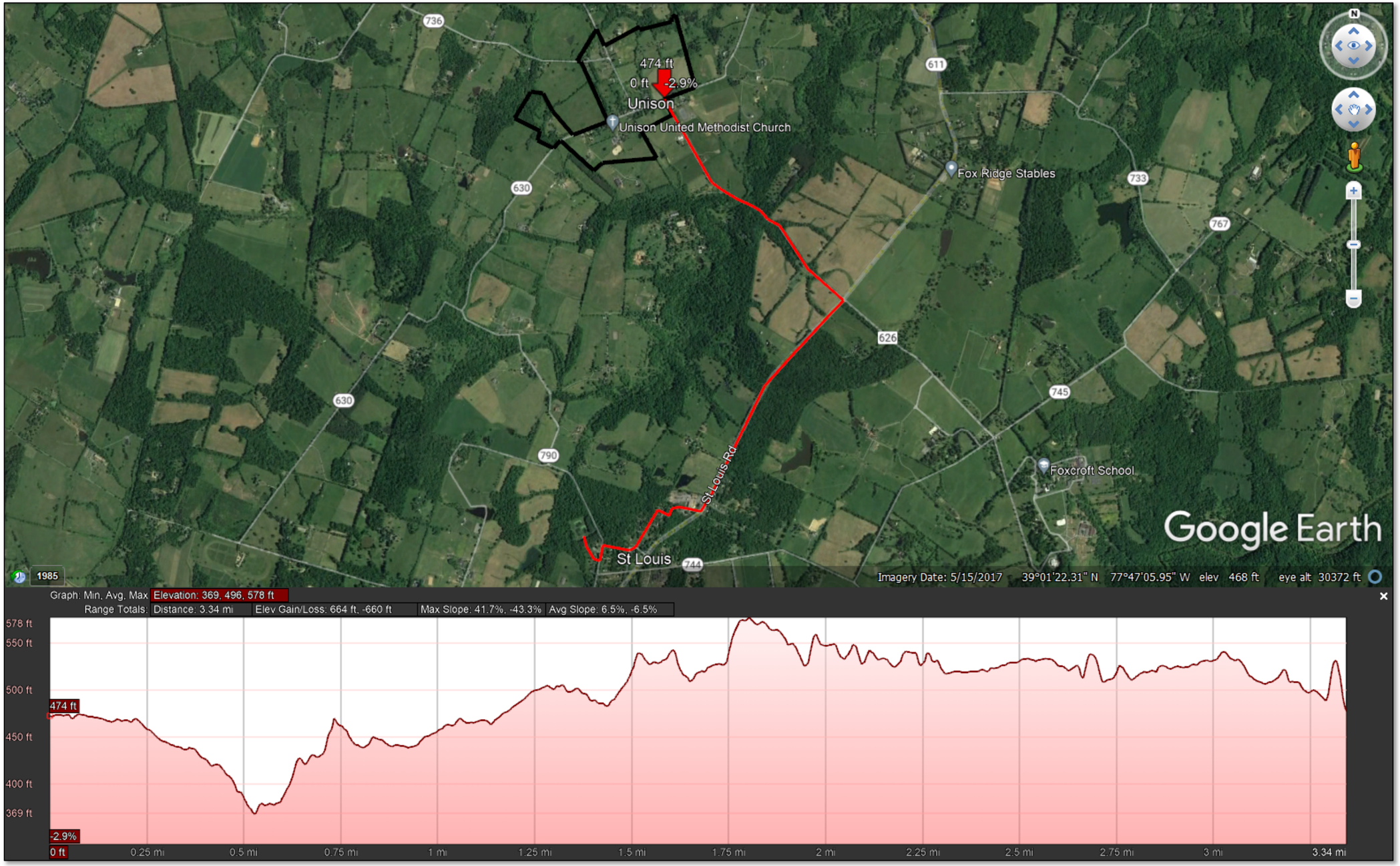

Figure 4-10 – Elevation Profile for Conceptual Layout Tie-in to St. Louis Gravity Sewer System

4.5 Alternatives Matrix & Wastewater System Recommendation

Similar to that described for the water system in Section 3.4, an alternatives matrix was developed to analyze the four (4) potential wastewater system alternatives. The same rating scores were used as shown in the section in **Table 3-3**, with higher scores meaning the alternative is more favorable.

The full matrix is included as **Table 4-4**. As a result of the analysis, it was determined that Alternative #2 (Subsurface Discharging Wastewater Treatment Facility - Communal Drainfield) is the most favorable for further analysis to address the wastewater system needs for the Unison community.

Alternative #2 includes the implementation of a communal sewage collection and treatment system, which disperses into a drainfield. Three (3) potential drainfield sites were identified in the soil analysis, as shown in **Figure 4-2**. The recommended conceptual layout is either the combination system or low-pressure system that conveys to the Southeast location, as shown in **Figure 4-3** and **Figure 4-4**. For the purposes of this study, cost estimates were developed for combination system since it will be more expensive. It should be noted that no discussions took place with property owners regarding potential drainfield and WWTP sites. These sites are shown conceptually for the purpose of this feasibility study and to show potential wastewater infrastructure alignments. Per the preliminary layout shown in **Figure 4-3**, approximately 4,430 LF of 8-inch gravity sewer pipe and 1,710 LF of low-pressure pipe, as well as approximately 15 manholes, are recommended to convey the sewage. It is assumed that the treatment system will be MBR system with odor control. All drainfield sites, piping and treatment system locations are shown preliminarily for conceptual purposes and some infrastructure may ultimately be located outside of the Unison study boundary.

Table 4-4 – Unison Wastewater Alternatives Matrix

Unison Wastewater Alternatives Matrix							
Alternative Number	**Constructability**	**Public Impacts**	**Costs**	**Approval/Acceptance**	**Environmental Impacts**	**Operations & Maintenance**	**Average Score**
Alternative 1 Upgrade Existing On-Site Systems	Land area not available on the majority of existing lots. May not be feasible for certain lots to construct new individual systems without obtaining offsite easements.	Each property would require upgrades. No improvement may be viable for several lots causing potential health concerns. Most lots would be required to obtain offsite easements to upgrade/expand existing systems.	Lower capital costs for upgrading and constructing new systems. Potential costs associated with obtaining offsite easements for existing system expansion.	Minimal approval requirements for existing systems. Pump and haul systems may be required for approval through LCHD. Offsite easements required for the majority of properties to improve/expand existing systems.	High potential for severe, negative impacts if non-compliant systems.	Homeowner ongoing operation and maintenance. Failing systems may require pump and haul and frequent pumping costs.	**1.3**
Raw Score	**1**	**1**	**2**	**2**	**1**	**1**	
Alternative 2 Subsurface Discharging Wastewater Treatment Facility (Communal Drain field)	Requires road work and restoration. Upgraded electrical power service required to wastewater treatment facility. Multiple conservation easements within project area could limit potential site alternatives for improvements.	Construction impacts for duration of project, traffic management, potential road closures.	High initial capital costs for treatment system and drain field area. High costs to provide 3 phase power to wastewater treatment facility.	Extensive easement and land acquisition requirements for treatment and drain field areas.	New treatment facility will centralize potential failure for non-compliance.	New community system to operate and maintain. Ongoing sewer fees paid by homeowners.	**2.5**
Raw Score	**3**	**3**	**2**	**1**	**3**	**3**	
Alternative 3 Surface Water Discharging Wastewater Treatment Facility (with Potential Discharge into Beaverdam Creek)	Potential to gravity flow effluent to Beaverdam Creek without pump station. Requires road work and restoration. Multiple conservation easements within project area could limit potential site alternatives for improvements. Options to obtain nutrient credits are minimal.	Construction impacts for duration of project, traffic management. Potential for WWTP in close proximity of residences.	High initial capital costs, especially with credit acquisition. High costs to provide 3 phase power to wastewater treatment facility.	Easements and land acquisition necessary. Nutrient credits may be required, which are not always readily available.	Increased risk of environmental impacts due to surface water discharge facility. New outfall required.	New community system to operate and maintain. Ongoing sewer fees paid by homeowners.	**1.8**
Raw Score	**2**	**2**	**1**	**1**	**2**	**3**	
Alternative 4 Conveyance and Pump Station Connection to a Nearby St. Louis Community System	Requires extensive construction and traffic management with several stream crossings. Pump station required with 3 plus mile force main. Potential requirement for separate odor control facility along force main. Potential for gravity sewer treatment plant upgrades within the St Louis sewer system.	Construction impacts for duration of project between Unison and St Louis communities. Potential odor issues at St. Louis gravity tie in.	Highest initial capital costs and connection fees.	Board of Supervisors approval required. Easements required. Potential for St Louis community input.	Force main and pump station may impact environmentally sensitive areas.	No additional treatment facility. New pump station required to convey sewage to existing collection system. Ongoing sewer fees paid by homeowners.	**2.0**
Raw Score	**1**	**1**	**1**	**2**	**3**	**4**	

5.0 OVERALL COSTS

The following section summarizes costs for the construction and operation of both a water system and wastewater system that would serve the community of Unison. These parametric costs are preliminary costs to present probable costs for implementation of the outlined systems. These costs are based on a Class IV cost estimate level with low range between -20% and high range of +30%, as defined by the Association for the Advancement of Cost Engineering (AACE International).

It should be noted that the cost estimates are preliminary. They include the necessary system components and the associated construction. The cost estimates prepared for both the water and wastewater systems represent preliminary values associated with the current population of Unison. Soft costs including design, permitting and surveying were calculated as 15% of total construction cost. It is also noted that the cost estimates have taken into consideration the market conditions including historically high inflation and specialty equipment shortages and long lead times as of May 2022. Furthermore, land acquisition is not included in the individual summaries, but is captured in the overall system summary **Table 5-8**.

5.1 Water System

5.1.1 Water System Capital Costs

5.1.1.1 Water Alternatives Cost Overview

As discussed above, two alternatives were identified as feasible for a water system to serve the Unison Community. The scope of this project would include service lines from the water main to a new water meter that will be installed for each connection. Homeowners will be responsible for making the connection to the new water meter. This work may include installation of new service line piping, existing well abandonment, internal piping modifications and site restoration.

For wells, if homeowners will not be using wells for irrigation purposes, each parcel will need to properly abandon the existing wells that are located on their parcel. Licensed well drillers will permanently seal an inactive well to prevent excess nutrients, pesticides, and other pollutants from entering surface and groundwater. Well abandonment depends on depth, whether or not there is an existing pump that needs to be pulled, and location. The average cost range of well abandonment is $1,000-$1,875. For the purpose of this feasibility study, it will be assumed that well abandonment will cost $1,875 per parcel and every parcel will abandon the well. As outlined above, it may not be necessary to abandon each well. Should homeowners choose to utilize the existing wells for irrigation, these costs may decrease. Well owners will need to obtain a Well Abandonment Permit from Loudoun County and pay the $300 permit fee. Therefore, the total cost for well abandonment is approximately $2,175. As previously discussed in Section 3.3.1, homeowners will be responsible for costs associated with private wells. In addition to any well modifications or abandonments, homeowners will also be responsible for connection of a water service line from the home to the water distribution system. The costs for this service line will vary property to property, depending on current plumbing configuration, and the required length of the service line. It is estimated that water service line installation and connection costs may range from $8,000 to $15,000 although actual costs may be lower or higher depending on individual property configurations.

5.1.1.2 Alternative #3 – Wholesale Purchase of Water from Nearby Municipal System

For development of the cost estimate for Alternative #3, which includes the wholesale purchase of water from nearby municipal system, it is assumed that water will be supplied from Middleburg. This alternative includes a distribution system within the Unison Community as well as a water main from Middleburg to Unison and booster pump station. For this alternative, it is assumed that the Middleburg system has sufficient capacity to serve the Unison Community and would not require additional wells to meet demand.

As shown in **Table 5-1,**The capital cost associated with this alternative is approximately $12 million with a high range of $15.7 million and a low range of $9.6 million. Additional costs to connect from the meter to the house and potential well abandonment are not included.

Table 5-1 – Alternative #3: Water System Capital Costs

Alternative #3 - Water System Summary	
Item	**Total**
Design, Permitting, & Surveying	$ 1,572,000.00
Water Distribution System (6" DIP Water Main, Booster Pump Station & Local Plant Upgrades)	$ 7,273,000.00
Road Restoration (Trench Rebuild w/Full Overlay)	$ 3,093,000.00
Easement Property Restoration	$ 113,000.00
Total Capital Costs	**$ 12,051,000.00**
Low Range Estimate (-20%)	$ 9,641,000.00
High Range Estimate (+30%)	$ 15,666,000.00

5.1.1.3 Alternative #2 – Communal Water Treatment Facility & New Community Well

As outlined above, the recommended water system to serve the community will consist of a communal well system and water distribution piping throughout the service area. The well and piping is anticipated to be designed and constructed to serve only as potable water and not for fire protection or irrigation demands.

For this alternative, it is assumed that the necessary quantity of groundwater is available at the location outlined above and that the quality of the water does not require advanced treatment.

Table 5-2 below summarizes the preliminary cost estimate for the potential water system.

Table 5-2 – Alternative #2: Water System Capital Costs

Alternative #2 - Water System Summary	
Item	Total
Design, Permitting, & Surveying	$ 673,000.00
Water Distribution System (6" DIP Water Main)	$ 2,309,000.00
Water Treatment System	$ 1,606,000.00
Road Restoration (5' Sawcut) - Asphalt	$ 483,000.00
Easement Property Restoration	$ 91,000.00
Total Capital Costs	**$ 5,162,000.00**
Low Range Estimate (-20%)	$ 4,130,000.00
High Range Estimate (+30%)	$ 6,711,000.00

In summary, the capital costs for constructing the proposed water system are approximately $5.2 million. The high and low range estimates for construction could range from $4.1 to $6.7 million. Additional costs to connect from the meter to the house and potential well abandonment are not included.

5.1.2 Community Water System Operation and Maintenance Costs

In addition to the capital costs associated with the implementation of these systems, there are long term costs associated with the operation and maintenance. Loudoun Water will be responsible for O&M costs for both community systems. All systems require electrical power as well as regular inspection and upkeep. For the water system, the wells will need to be maintained and the chlorine supplied.

The estimated operation and maintenance costs for the water system includes maintenance of parts, operator time, routine maintenance and power costs. The preliminary operation and maintenance cost estimate for the water system is shown in **Table 5-3**.

Table 5-3 – Water System O&M Costs

Estimated Maintenance Costs		
Item	**Unit**	**Cost**
Maintenance Parts (consumables/repair)	$/year	$ 1,500.00
General Equipment Maintenance[1]	$/year	$ 5,100.00
Facility Maintenance[2]	$/year	$ 3,000.00
Estimated Operational Costs		
Item	**Unit**	**Cost**
Standard Operating Personnel[3]	$/year	$ 77,100.00
Routine Maintenance[4]	$/year	$ 12,800.00
Power Cost[5]	$/year	$ 7,000.00
Chemicals	$/year	$ 5,900.00
Total Capital Costs		**$ 112,400.00**
Low Range Estimate (-20%)		$ 89,900.00
High Range Estimate (+30%)		$ 146,100.00

[1]Includes costs associated with monthly, annual and semi-annual maintenance of equipment

[2]Includes maintenance costs associated with the well area including leaf removal, grass trimming, etc.

[3]The cost of 1 operator for three (3) four (4) hour visits per week at $123.51 per hour

[4]Time spent in addition to standard maintenance to maintain technology specific equipment. Assumes 2 hour per week at $123.51 per hour

[5]Assumes 120 kWh/day at $0.16/kWh

5.2 Wastewater System

5.2.1 Community Wastewater System Capital Costs

Capital costs for the feasible wastewater systems are presented below.

5.2.1.1 Alternative #3 – Surface Discharge

As discussed above, Alternative #3 includes construction of a WWTP in or around Unison. Treated effluent from the WWTP would be discharged into the Beaverdam Creek as a surface discharge system. This alternative includes a combination collection system (low pressure and gravity sewer) within Unison, an advanced wastewater treatment. The capital costs shown in **Table 5-4** also include purchase of nutrient credits. It should be noted that nutrient credits prices fluctuate based on availability.

The total capital cost for this alternative is approximately $7.6 million with a low range of $6.0 million and a high range of $9.8 million.

Table 5-4 – Alternative #3: Wastewater System Capital Costs

Wastewater System Summary	
Item	**Total**
Design, Permitting, & Surveying	$ 985,000.00
Collection System (Low Pressure & Gravity Sewer)	$ 3,040,000.00
Treatment and Disposal System (SBR w Surface Discharge, Nutrient Credit Purchase)	$ 1,560,000.00
Individual Parcel Improvements (Grinder Pump, Electrical Box, Lateral & Valve Assembly)	$ 544,000.00
Road Restoration & Site Work	$ 1,422,000.00
Total Capital Costs	**$ 7,551,000.00**
Low Range Estimate (-20%)	$6,041,000
High Range Estimate (+30%)	$9,816,000

5.2.1.2 Alternative #4 – Connection to Nearby Municipality

Alternative #4 includes a combination sewer collection system with a pump station and force main to carry flows to St. Louis. This alternative also assumes upgrades will be necessary at St. Louis to allow for this

connection. As shown in **Table 5-5**, the total capital cost associated with this alternative is approximately $17.7 million with a low range f $14.1 million and a high range of approximately $23 million.

Table 5-5 – Alternative #4: Wastewater System Capital Costs

Wastewater System Summary	
Item	**Total**
Design, Permitting, & Surveying	$ 2,946,000.00
Collection System (Low Pressure & Gravity Sewer)	$ 3,405,000.00
Pump Station & Force Main	$ 7,922,000.00
Individual Parcel Improvements (Grinder Pump, Electrical Box, Lateral & Valve Assembly)	$ 544,000.00
Road Restoration & Site Work	$ 2,860,000.00
Total Capital Costs	**$ 17,677,000.00**
Low Range Estimate (-20%)	$14,142,000
High Range Estimate (+30%)	$22,980,000

5.2.1.3 Alternative #2 – Subsurface Discharge Wastewater Treatment Facility (Communal Drainfield)

As discussed above, the recommended wastewater system will consist of a combination and low-pressure sewer system, gravity sewer to a wastewater treatment system, and a drainfield with nitrogen dilution area. The system also requires gravity sewer laterals and grinder pumps to be installed on some individual customers' properties. **Table 5-6** summarizes the preliminarily assessed associated costs for the recommended system.

Table 5-6 – Alternative #2: Wastewater System Capital Costs

Wastewater System Summary	
Item	**Total**
Design, Permitting, & Surveying	$ 999,000.00
Collection System (Low Pressure & Gravity Sewer)	$ 2,409,000.00
Treatment and Disposal System (MBR w Drainfield)	$ 2,283,000.00
Individual Parcel Improvements (Grinder Pump, Electrical Box, Lateral & Valve Assembly)	$ 544,000.00
Road Restoration & Site Work	$ 1,422,000.00
Total Capital Costs	**$ 7,657,000.00**
Low Range Estimate (-20%)	$ 6,126,000.00
High Range Estimate (+30%)	$ 9,954,000.00

In summary, the capital costs for constructing the proposed wastewater system are approximately $7.7 million. The high and low range estimates for construction could range from $6.1 to $9.9 million. It should be noted that total capital cost of the low-pressure system option is approximately $1.6 million less than (or approximately 22% less than) the combination system. It should be noted that individual parcel

improvements were included in the capital costs. In the future the responsibility for these costs will need to be refined and potentially a portion distributed to property owners, depending on project funding. There is a cost associated with individual parcels including the installation of the grinder pump, modification to the house lateral connection (gravity and LPS), and construction of a 1.25-inch pressure service lateral or 4 to 6-inch gravity lateral. In addition, there will be costs associated with the proper abandonment of the existing systems. For the purpose of this feasibility study, the connection cost for each parcel includes the installation of the LPS equipment and/or gravity lateral. This includes the grinder pump and tank, valve assembly, and service line and lateral connection piping (gravity and LPS), and electrical components. A typical gravity system lateral connection and gravity lateral connection is shown in **Figure 5-1**.

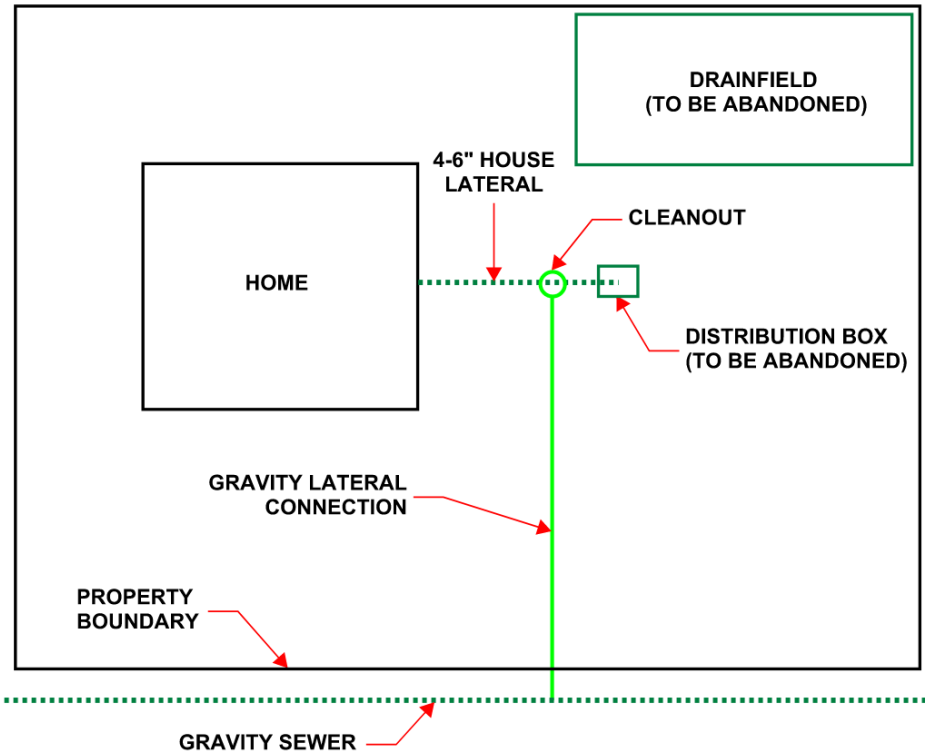

Figure 5-1 – Gravity Sewer System Lateral Connection

The total cost estimated for these individual parcel improvements is approximately $17,000 per parcel as shown in the summary above.

Homeowners will also need to properly abandon existing septic systems prior to connecting to the wastewater collection system. There are multiple factors that impact the cost of septic abandonment. These factors include tank size, distribution piping, drainfield size and type, and location. Costs of septic abandonment typically range from $1,250 to $6,250. For the purpose of this feasibility study, it will be assumed that septic abandonment will cost $6,250. Owners will need to obtain a Sewage Disposal System Abandonment Permit from Loudoun County. There is no fee associated with this permit. Homeowners will be responsible for costs associated with private septic systems.

Additionally, it will be the homeowner's responsibility to make lateral connections to the sewer system and electrical hookups if the property is being served by a low-pressure system. Similar to water service lines

(discussed above), lateral connection costs will vary property to property, depending on current plumbing, and the required length of lateral. It is estimated that lateral revision and connection costs may range from $8,000 to $15,000 although actual costs may be lower or higher depending on individual property configurations. Grinder pumps for low pressure sewer systems include an electrical pump panel that will require an electrical connection, and depending on available sockets within the house, an upgrade may be required. This cost could range from approximately $1,500 to $2,000.

5.2.2 Community Wastewater System Operation and Maintenance Costs

For the wastewater system, the MBR treatment system will require removal of sludge, regular maintenance to ensure proper system functionality and upkeep to prevent failure. There is little associated cost of maintaining the drainfields. There are also costs associated with the upkeep of the LPS system, specifically as it relates to the grinder pumps. There should be little if any costs associated with the gravity system.

The estimated operation and maintenance costs for the wastewater system includes maintenance of parts, operator time, routine maintenance and power costs. The preliminary operation and maintenance cost estimate for the wastewater system is shown in **Table 5-7**. Loudoun Water will be responsible for O&M costs for both community systems.

Table 5-7 – Wastewater System O&M Costs

Estimated O&M Costs for a Water Treatment System		
Estimated Maintenance Costs		
Item	**Unit**	**Cost**
Maintenance Parts (consumables/repair)	$/year	$ 8,500.00
General Equipment Maintenance[1]	$/year	$ 36,500.00
Facility Maintenance[2]	$/year	$ 2,900.00
Pump Station Maintenance Parts	$/year	$ 2,600.00
Estimated Operational Costs		
Item	**Unit**	**Cost**
WWTP Standard Operating Personnel[3]	$/year	$77,100
Pump Station Operating Expenses	$/year	$36,200
Routine Maintenance[4]	$/year	$11,200
Power Cost[5]	$/year	$8,800
Chemicals	$/year	$1,500
Sludge Hauling/Disposal[6]	$/year	$6,800
Well Monitoring	$/year	$10,000
Total Capital Costs		**$202,100**
Low Range Estimate (-20%)		$161,700
High Range Estimate (+30%)		$262,700

[1]Includes costs associated with monthly, annual and semi-annual maintenance of treatment equipment

[2]Includes maintenance costs associated with the treatment facility including leaf removal, grass trimming, etc.

[3]The cost of 1 operator for three (3) four (4) hour visits per week at $123.51 per hour. Pump Station Expenses assume two (2) four (4) hour visits per week.

[4]Time spent in addition to standard maintenance to maintain technology specific equipment. Assumes 2 hour per week at $123.51 per hour

[5]Assumes 150 kWh/day at $0.16/kWh for both Pump Station and WWTP

[6]Assumes $3375/haul of 2- 3,000 gallons

5.3 Cost Summary

The cost estimates outlined above represent a preliminary opinion of probable construction cost (OPCC) for the current homeowners. The OPCC prepared for this feasibility is considered an Association for the Advancement of Cost Engineering International's (AACE) Class IV cost estimate which is used for detailed strategic planning for economic and technical feasibility. The Class IV estimate prepared includes a range for the estimate of -20% and 30%. The cost estimates developed as part of this study are based on the assumptions outlined throughout the report. This includes the community boundary, drainfield location, drainfield size and treatment type. Costs will be further refined as the project progresses through the Commission Permit process and enters into preliminary design.

The capital costs for both projects are shown in **Table 5-8** below. In addition to the capital cost summary presented below, there are additional costs that need to be considered. These costs include the soft costs (i.e., engineering, legal, survey, permitting, etc.) and land acquisition costs. Above tables include an additional summary below the high range estimate that outlines parametric estimates for these costs. The soft costs have been developed assuming 15% of the capital cost of all work. The land acquisition costs are based on obtaining easement rights from properties for all improvements. The easement rights have been estimated between $30,000 to $50,000 per acre depending on the easement type (i.e., water main, treatment facility, drainfield, etc.). It is assumed that approximately 31.5 acres of easement rights will be necessary, which would include the water treatment plant, wastewater treatment plant, drainfield and dilution area, and watermain easements.

Table 5-8 – Capital Cost Summary

Water/Wastewater Cost Summary	
Item	**Total**
Water System (Alternative #2)	$5,162,000.00
Wastewater System (Alternative #2)	$7,657,000.00
Capital Cost Total	**$12,800,000.00**
Low Range Estimate (-20%)	$10,200,000.00
High Range Estimate (+30%)	$16,600,000.00
Land/Easement Acquisition	$1,260,000.00
Project Total (Including Capital Cost, Soft Cost and LA)	**$14,060,000.00**

Table 5-9 summarizes the life cycle analysis of community well and water treatment facility, water conveyance system, wastewater treatment facility, wastewater collection system, and all associated O&M costs mentioned in this study. The analysis accounts for a 30-year life cycle with a 3% interest.

Table 5-9 – Present Worth Analysis

Present Worth Analysis		
Full Build-Out		
Disposal Method	**Water System**	**Wastewater System**
Initial Capital Cost	$4,489,000.00	$6,657,000.00
Yearly O&M Costs	$112,400.00	$202,100.00
Lifecycle (yrs)	30	30
Interest Rate	3%	3%
Net Present Cost	$6,700,000.00	$10,600,000.00

5.4 Schedule

The approximate schedule for implementing the recommended alternatives is shown in **Figure 5-2**. It should be noted that an implementation schedule is dependent on the design, permitting and approval process with outside stakeholders. It should also be noted that the legislative approval process covers the special exception and commission permit (CMPT) process, which includes extensive public comment periods and board approvals.

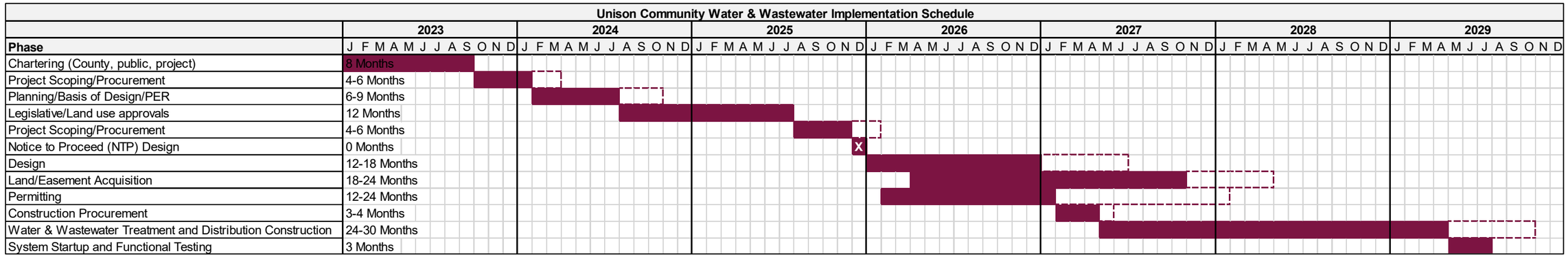

Figure 5-2 – Unison Community Water & Wastewater Implementation Schedule

6.0 SUMMARY & RECOMMENDATIONS

Based on the evaluation presented in this feasibility study, the following recommendations were provided to address the needs of the Unison community:

- Water: Alternative #2 – Communal Water Treatment Facility (Using New Community Well)
- Wastewater: Alternative #2 – Communal Subsurface Discharging Wastewater Treatment Facility

Figure 6-1 displays both the recommended water and wastewater conceptual layouts. It should be noted that no discussions took place with property owners regarding potential well sites or treatment plant sites. These sites are shown conceptually for the purpose of this feasibility study and to show potential infrastructure alignments. Some infrastructure may ultimately be located outside of the Unison study boundary. It should be noted that cost estimates assumed water and wastewater improvements will be built concurrently with only one roadway overlay, which was accounted for in the wastewater estimates.

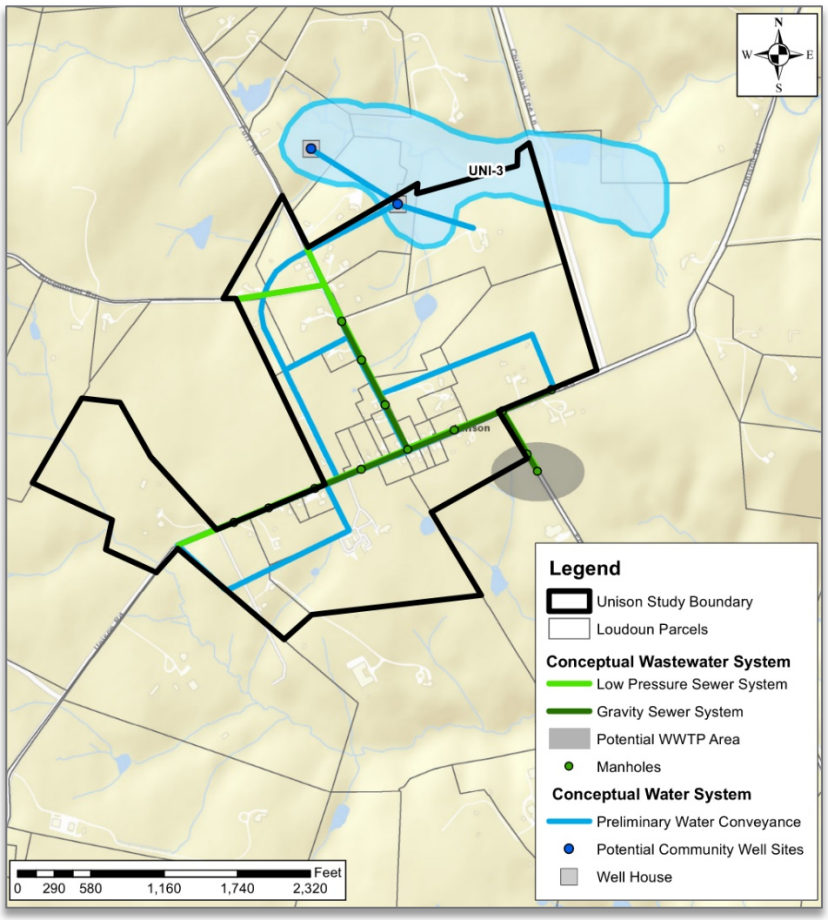

Figure 6-1 – Recommended Conceptual Water and Wastewater System Layouts

For the water system, Alternative #2 includes the implementation of a water distribution and treatment system. Two (2) potential well sites, as shown in **Figure 3-4**, have been identified that may provide adequate yield to convey the estimated future demand of 61 gpm to Unison. Per the preliminary layout shown in **Figure 3-4**, approximately 13,690 LF of 6-inch DIP is recommended to convey the water. Greensand filtration is the recommended treatment system due to the presumed presence of iron in the water. For the purposes of this feasibility study, it is also assumed that there will be one (1) treatment system for all wells. The preliminary cost of this alternative, which includes the design/permitting/surveying for the project, construction of the water distribution system and the water treatment system (assuming one greensand filtration treatment system), property restoration and road restoration (for saw cutting) is approximately $5.2 million (with a low range of $4.1 million and high range of $6.7 million). Additional costs associated with this alternative include O&M costs, which are approximately $112,000 (with a low range of $90,000 and high range of $146,000). The total cost per well abandonment is approximately $2,175. Finally, a present worth analysis reveals the net present cost of Option 2 to be approximately $7.0 million.

For the wastewater system, Alternative #2 includes the implementation of a communal sewage collection and treatment system, which disperses into a drainfield. Three (3) potential drainfield sites were identified in the soil analysis, as shown in **Figure 4-2**. The recommended conceptual layout is either the combination system or low-pressure system that conveys to the Southeast location, as shown in **Figure 4-3** and **Figure 4-4**. Per the preliminary layout shown in **Figure 4-3**, approximately 4,430 LF of 8-inch gravity sewer pipe and 1,710 LF of low-pressure pipe, as well as approximately 15 manholes, are recommended to convey the sewage. For the purposes of this study, cost estimates were developed for combination system since it will be more expensive. The preliminary cost of this alternative, which includes the design/permitting/surveying for the project, construction of the wastewater distribution and treatment system (assuming one MBR treatment system with odor control), individual parcel improvements and road restoration/site work is approximately $7.7 million (with a low range of $6.1 million and high range of $9.9 million). It should be noted that total capital cost of the low-pressure system option is approximately $1.6 million less than (or approximately 22% less than) the combination system. Additional costs associated with this alternative include O&M costs, which are approximately $202,000 (with a low range of $162,000 and high range of $263,000). Finally, a present worth analysis reveals the net present cost of this alternative to be approximately $10.6 million.

The total capital cost for implementing both recommended alternatives is approximately $12.8 million, and the overall cost including soft costs (i.e., engineering, legal, survey, permitting, etc.) and land/easement acquisition is approximately $14.1 million.

Appendix A

Preliminary Environmental Screening Inventory

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Environmental Screening Inventory Summary
Unison Community Water and Wastewater Study
Loudoun County, VA

In December 2021, Dewberry Engineers completed a preliminary environmental screening inventory for the planned Unison Community Water and Wastewater Study in Loudoun County, VA. The purpose of the preliminary screening was to identify potential constraints within the project area. Below is a summary of what was found during the screening.

Documented and Potential Threatened & Endangered Species – Appendix A

A review of the U.S. Fish & Wildlife Service's Information for Planning and Consultation (IPaC) database detailed the potential for the following species to be encountered within the project area. These include the Northern Long-eared Bat (Myotis septentrionalis; Listed Threatened Species), and the Monarch Butterfly (Danaus plexippus; Unlisted, Candidate Species). Additionally, the Virginia Department of Wildlife Resources has listed potential for two (2) State Threatened Species to be encountered within the project area, which are the Loggerhead Shrike (Lanius ludovicianus) and the Green Floater (Lasmigona subviridis). These reviews are only valid for a 90-day period; additional review is recommended at the project permitting stage. See Appendix A for further information.

Time of Year restrictions for construction may be required by the permitting agencies for tree clearing and instream work to avoid and minimize impacts to the bat and mussel species, respectively. At the time of this review, candidate species have no protections afforded under the Endangered Species Act. It should be noted that the Northern Long-eared Bat is proposed to be elevated to Endangered status potentially later this year, which may have impacts of Time of Year restrictions for tree removal.

Documented Cultural Resources – Appendix B

Dewberry conducted a review of the Virginia Department of Historic Resources – Virginia Cultural Resource Information System (VCRIS) to assess if any documented archaeological and/or architectural resources have been noted within the project area, and if any Phase I surveys have been conducted.

The Unison Historic District and the Unison Battlefield Historic District encompass the project area and contain nine distinct architectural resources and 25 individual historic properties. According to the Virginia Department of Historic Resources (VDHR), only two of these resources have been evaluated for listing as a "historic place".

Three battlefields were found to intersect with the project area, these include: The Battle of Middleburg, the Upperville Battlefield, and the Battle of Unison. The Battle of Middleburg and the Upperville Battlefield do not strongly intersect with the project area, the furthest extents of these historic areas lie within Unison and are largely associated with Route 630 and 626; neither of these are listed on the National Register of Historic Places (NRHP) or the Virginia Landmarks Register (VLR). The Battle of Unison, however, encompasses the entire village and the Unison Historic District; the Battle of Unison is registered on both the NRHP and VLR. The VDHR lists both the Battle of Middleburg and the Upperville Battlefield as "Potentially Eligible" for listing as a NRHP or VLR.

The village has not undergone Phase 1 surveys for archaeological or architectural resources. We would caution, if a Phase I survey is required by the resource agencies it will likely require excavation of screened shovel testing within project limits of disturbance, general site reconnaissance and a technical report outlining the historic contexts of the project area. Additional resources may be discovered. See Appendix B for more information.

Potential Wetlands, Streams & Floodplain – Appendix C

Dewberry reviewed the U.S. Fish & Wildlife Service National Wetlands Inventory Database, as well as the Loudoun County GIS maps to assess the location of potential wetlands and streams within and adjacent to the project area. Mapped streams and wetlands exist within the project area. However, these areas are small and can likely be avoided.

Dependent on the proposed amount of impacts to jurisdictional wetlands and streams, regulatory permitting agencies may require avoidance, minimization and eventually mitigation for unavoidable wetland impacts and conversion of wetlands to uplands, as well as the conversion of forested wetlands into either non-woody emergent wetlands or maintained utility right of ways. Wetland and stream mitigation banking costs have been varying wildly, based on availability, but can be as high as $500,000 per acre and $850/linear foot of stream channel.

Dewberry reviewed the FEMA floodplain map for this project area and found that nearly the entire project area lies outside of a flood hazard area. Some areas in the western most limits lie within Zone X, an area with 0.2% chance of an annual flood hazard.

See Appendix C for further information on streams, wetlands, and floodplain.

Documented Hazardous Materials Spills and Documented Petroleum Facilities – Appendix D

Dewberry reviewed the VDEQ – What's in My Backyard database for documented Hazardous Material Spills as well as the location of existing Registered Tank Facilities and known Petroleum Releases. The database results noted three closed petroleum spills, and one closed registered petroleum tank facility within the project area. While the incidents are closed, there is still a potential to encounter petroleum contaminated soils downgradient of the spill site. See Appendix D for the DEQ mapping.

Project Soils Information – Appendix E

Using the Natural Resources Conservation Service Soil Mapping Database, Dewberry was able to generate a report documenting the known soil types within the project corridor. See Appendix E for further detail.

Impaired Waters – Appendix F

Using the DEQ VEGIS TMDL_IP Watersheds (https://apps.deq.virginia.gov/mapper_ext/?service=public/TMDL_IP_Watersheds), Dewberry was able to discern that the project area watershed is impaired for bacteria.

Federal, State and Local Lands – Appendix G

Using an online mapping tool provided by The Virginia Department of Conservation & Recreation (https://vanhde.org/content/map) Dewberry found no documented Federal Lands, State Parks, or Local Lands within the planned project vicinity.

Virginia Outdoors Foundation Conservation Easements Appendix H

Dewberry reviewed the online mapping tool provided by The Virginia Department of Conservation & Recreation (https://vanhde.org/content/map) and found multiple conservation easements that intersect with the project area. These lands typically require replacement lands of both equal and adjacent if impacted. See Appendix I.

Appendix A

Threatened & Endangered Species

Dewberry

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To: December 02, 2021
Consultation Code: 05E2VA00-2022-SLI-0974
Event Code: 05E2VA00-2022-E-03324
Project Name: Unison Water Preliminary Work

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

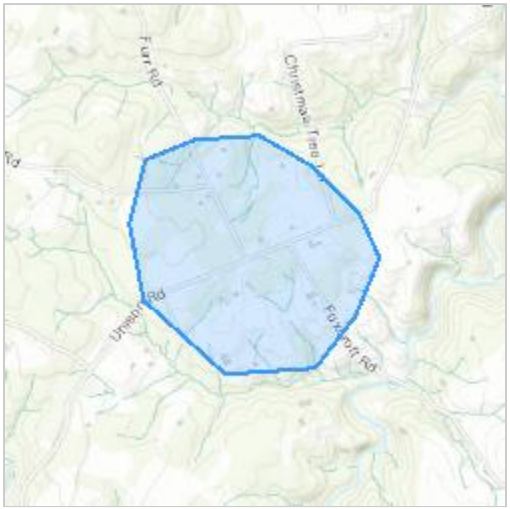
This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2022-SLI-0974
Event Code: Some(05E2VA00-2022-E-03324)
Project Name: Unison Water Preliminary Work
Project Type: WATER SUPPLY / DELIVERY
Project Description: Preliminary work for a community well for the village of unison, virginia.
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.03544435,-77.79019076639236,14z



Counties: Loudoun County, Virginia

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

REFUGE INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

VaFWIS Search Report Compiled on 12/2/2021, 9:24:41 AM

Known or likely to occur within a **2 mile radius around point 39.0349600 -77.7905399** in **107 Loudoun County, VA**

View Map of Site Location

493 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 26) (26 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon		BOVA
050022	FTST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata		BOVA
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050027	SE	Ia	Bat, tri-colored	Perimyotis subflavus		BOVA
060006	SE	Ib	Floater, brook	Alasmidonta varicosa		BOVA
030062	ST	Ia	Turtle, wood	Glyptemys insculpta		BOVA,HU6
040096	ST	Ia	Falcon, peregrine	Falco peregrinus		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus	Potential	BOVA,BBA,HU6
040379	ST	Ia	Sparrow, Henslow's	Centronyx henslowii		BOVA
060081	ST	IIa	Floater, green	Lasmigona subviridis	Potential	BOVA,Habitat,HU6
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
030063	CC	IIIa	Turtle, spotted	Clemmys guttata		BOVA
030012	CC	IVa	Rattlesnake, timber	Crotalus horridus		BOVA,HU6
040092		Ia	Eagle, golden	Aquila chrysaetos		BOVA
040306		Ia	Warbler, golden-winged	Vermivora chrysoptera		BOVA,HU6
100248		Ia	Fritillary, regal	Speyeria idalia idalia		BOVA,HU6
040213		Ic	Owl, northern saw-whet	Aegolius acadicus		BOVA,HU6
040052		IIa	Duck, American black	Anas rubripes		BOVA,HU6
040036		IIa	Night-heron, yellow-crowned	Nyctanassa violacea violacea		BOVA
040320		IIa	Warbler, cerulean	Setophaga cerulea		BOVA,HU6
040140		IIa	Woodcock, American	Scolopax minor		BOVA,HU6
060071		IIa	Lampmussel, yellow	Lampsilis cariosa		BOVA,HU6
040203		IIb	Cuckoo, black-billed	Coccyzus erythropthalmus		BOVA
040105		IIb	Rail, king	Rallus elegans		BOVA
100166		IIc	Skipper, Dotted	Hesperia attalus slossonae		BOVA,HU6

To view **All 493 species** View 493

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier
Virginia Widlife Action Plan Conservation Opportunity Ranking:
a - On the ground management strategies/actions exist and can be feasibly implemented.; b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.; c - No on the grou

View Map of All Query Results from All Observation Tables

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

N/A

Impediments to Fish Passage (1 records)

View Map of All Fish Impediments

ID	Name	River	View Map
1234	RAYBORN DAM	TR-GOOSE CREEK	Yes

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Species Observations (15 records)

View Map of All Query Results Species Observations

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE*	Highest Tier**	
29286	SppObs	Jan 1 1900	Mitchell, J. C.	1		IV	Yes
300731	SppObs	Jul 20 2001	ROGER B. CLAPP	1			Yes
300730	SppObs	Jul 20 2001	ROGER B. CLAPP	1			Yes
300729	SppObs	Jul 20 2001	ROGER B. CLAPP	1			Yes
300728	SppObs	Jul 20 2001	ROGER B. CLAPP	1			Yes
300727	SppObs	Jul 20 2001	ROGER B. CLAPP	1			Yes
300726	SppObs	Jul 20 2001	ROGER B. CLAPP	1			Yes
66719	SppObs	May 24 2000	Robert Clapp (principle permittee)	1			Yes
63290	SppObs	Jul 20 1998	Billy M. Teels, NRCS Wetland Science Institute	22			Yes
63287	SppObs	Jul 17 1998	Billy M. Teels, NRCS Wetland Science Institute	21			Yes
7082	SppObs	Jul 22 1994	ROGER B. CLAPP	1			Yes
16281	SppObs	Jun 4 1983	R. E. WATSON	9			Yes
337690	SppObs	Jan 1 1983	REW-B-WATSON	9			Yes
336927	SppObs	Jan 1 1980	RCS-B-SIMPSON	1			Yes
27715	SppObs	Jan 1 1900	Mitchell, J. C.	1			Yes

Displayed 15 Species Observations

Habitat Predicted for Aquatic WAP Tier I & II Species (1 Reach)

View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

Stream Name	Tier Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Beaverdam Creek (20700081)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Virginia Breeding Bird Atlas Blocks (4 records)

View Map of All Query Results
Virginia Breeding Bird Atlas Blocks

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE*	Highest Tier**	
48214	Bluemont, CE	55		III	Yes
48213	Bluemont, CW	75		III	Yes
48216	Bluemont, SE	65		III	Yes
48215	Bluemont, SW	78	ST	I	Yes

Public Holdings:

N/A

Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
107	Loudoun	438	FTSE	I

USGS 7.5' Quadrangles:
Bluemont

USGS NRCS Watersheds in Virginia:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL10	Goose Creek-Wancopin Creek	60	ST	I
PL11	Beaverdam Creek	60	ST	I

Compiled on 12/2/2021, 9:24:41 AM I1150904.0 report=all searchType= R dist= 3218 poi= 39.0349600 -77.7905399
PixelSize=64; Anadromous=0.018259; BBA=0.029981; BECAR=0.018347; Bats=0.017924; Buffer=0.059571; County=0.045879; HU6=0.040916; Impediments=0.019546; Init=0.085816; PublicLands=0.019295; Quad=0.022026; SppObs=0.219428; TEWaters=0.020285; TierReaches=0.043977; TierTerrestrial=0.024893; Total=0.845205; Tracking_BOVA=0.17604

VaFWIS - Department of Game and Inland Fisheries

39.03496 -77.79053
is the Search Point
Submit Cancel

Search Point
- **Change** to "clicked" map point
- **Fixed** at 39.03496 -77.79053

Show Position Rings
Yes No
1 mile and 1/4 mile at the **Search Point**

Show Search Area
Yes No
2 Search distance miles radius

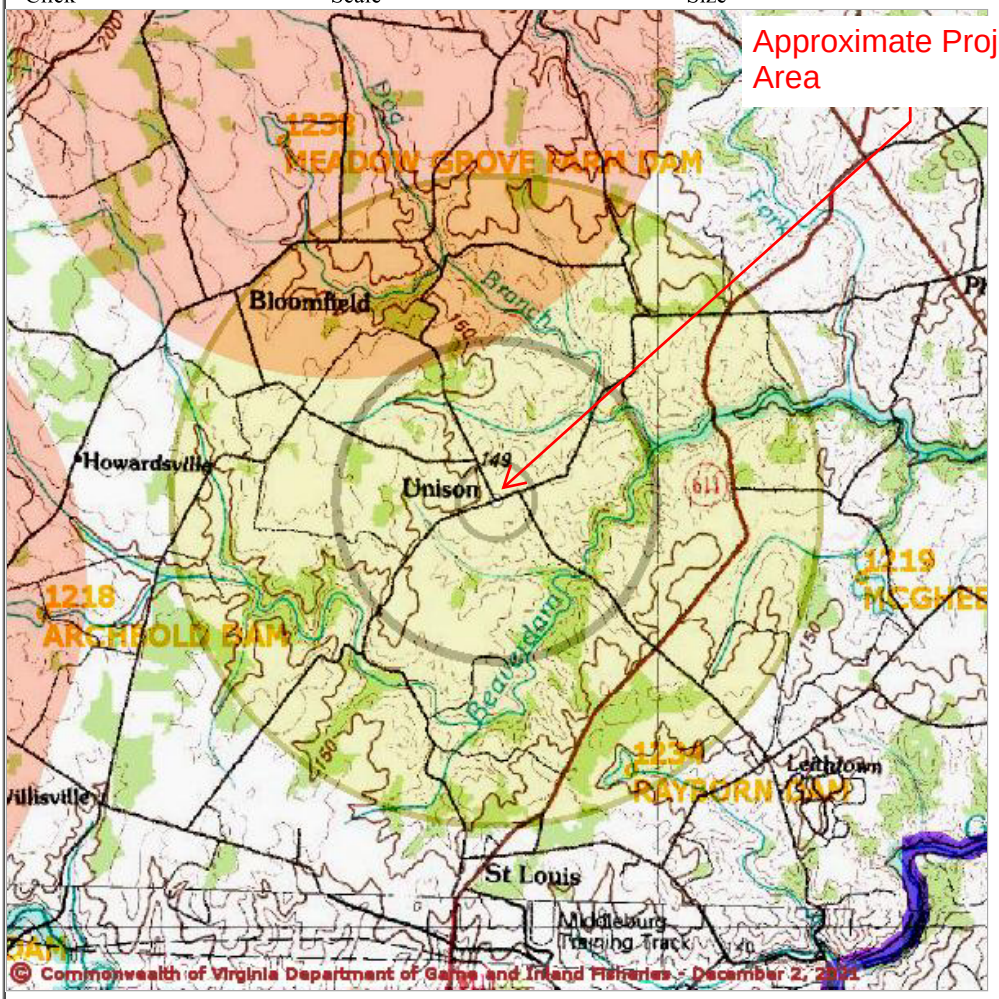
Search Point is at map center

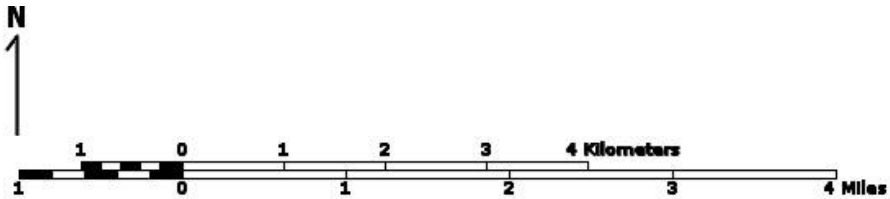
Base Map Choices
Topography

Map Overlay Choices
Current List: Anadromous, TEWaters, Trout, TierII, Habitat, Position, Search

Map Overlay Legend

back
Map Click Pan Id M
Refresh Browser Page
Map Scale In Zoom Out
Screen Size Small Size Big
Help





Point of Search 39.03496 -77.79053
Map Location 39.03496 -77.79053

Select **Coordinate System:**
- Degrees,Minutes,Seconds Latitude - Longitude
- Decimal Degrees Latitude - Longitude
- Meters UTM NAD83 East North Zone
- Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 253663 and top 4329162. Pixel size is 16 meters . Coordinates displayed are decimal Degrees North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

T & E Waters

Federal

State

Predicted Habitat
WAP Tier I & II

Aquatic

Terrestrial

Trout Waters

Class I - IV

Class V - VI

Anadromous Fish Reach

Confirmed

Potential

23 Impediment

Position Rings at the Search Point

2 mile radius Search Area

Data Observation Site 2 Mile WAP Tier I+II

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
http://www.national.geographic.com/topo
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2021-12-02 09:23:16 (qa/qc March 21, 2016 12:20 - tn=1150904 dist=3218 I
)
$poi=39.0349600 -77.7905400

Tier Reaches Group Beaverdam Creek (20700081)

39,02,05.8 -77,47,25.9 is **the Search Point**

Display at center	**Item Location** is not at map center

Show Position Rings
(●) Yes ( ) No
1 mile and 1/4 mile at the **Search Point**

Show Search Area
(●) Yes ( ) No
2 Search distance miles radius

Search Point is at map center

Base Map Choices
Topography

Map Overlay Choices
Current List: Position, Search, Observation

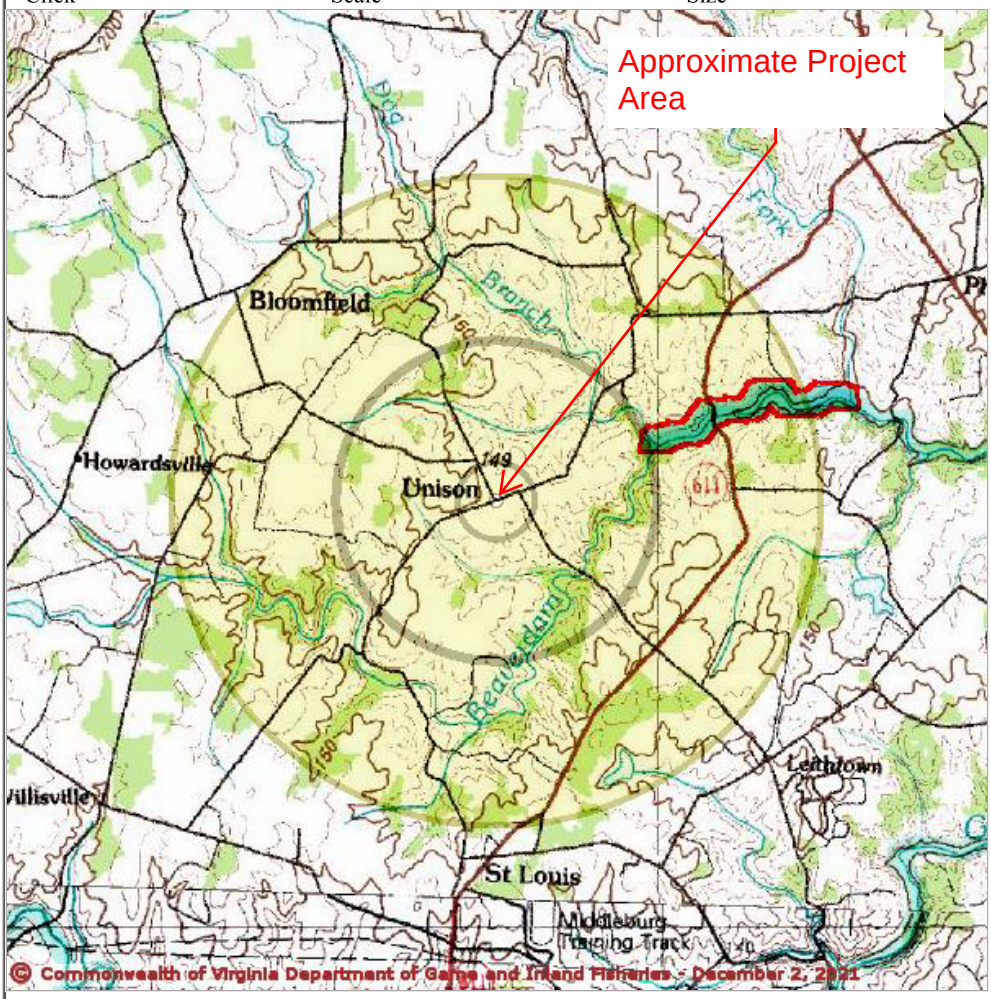
Map Overlay Legend

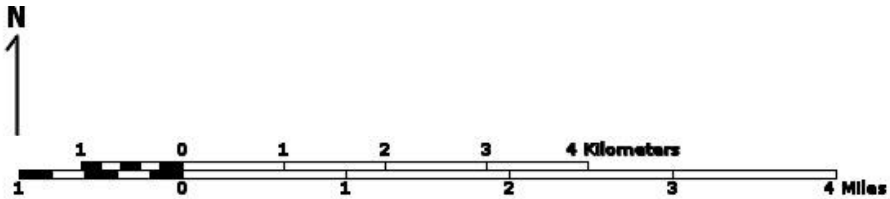
Position Rings 1 mile and 1/4 mile at the Search Point

2 mile radius Search Area

Data Observation Site

39,00,40.1 -77,49,37.5
Map Click Pan Id M
Map Scale In Zoom Out
Refresh Browser Page
Screen Size Small Size Big
Help





Point of Search 39,02,05.8 -77,47,25.9
Map Location 39,02,05.8 -77,47,25.9

Select **Coordinate System:**
(●) Degrees,Minutes,Seconds Latitude - Longitude
( ) Decimal Degrees Latitude - Longitude
( ) Meters UTM NAD83 East North Zone
( ) Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 253663 and top 4329162. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5

	square miles. Topographic maps and Black and white aerial photography for year 1990+- are from the United States Department of the Interior, United States Geological Survey. Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network. Shaded topographic maps are from TOPO! ©2006 National Geographic http://www.national.geographic.com/topo All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries. map assembled 2021-12-02 09:28:17 (qa/qc March 21, 2016 12:20 - tn=1150904.1 dist=3218 I) $poi=39.0349600 -77.7905399$query=select Convert(varchar(10),floor((minx+maxx)/2)) + ' ' + Convert(varchar(10),floor((miny+maxy)/2)) from vafwis_tables.dbo.cvTierReaches where SEG_ID in ('207000818544 ')

BBA Bluemont, SW

39,02,05.8 -77,47,25.9
is **the Search Point**

Display at center	**Item Location** is not at map center

Show Position Rings
(●) Yes ( ) No
1 mile and 1/4 mile at the **Search Point**

Show Search Area
(●) Yes ( ) No
2 Search distance miles radius

Search Point is at map center

Base Map Choices
Topography

Map Overlay Choices
Current List: Position, Search, Observation

Map Overlay Legend

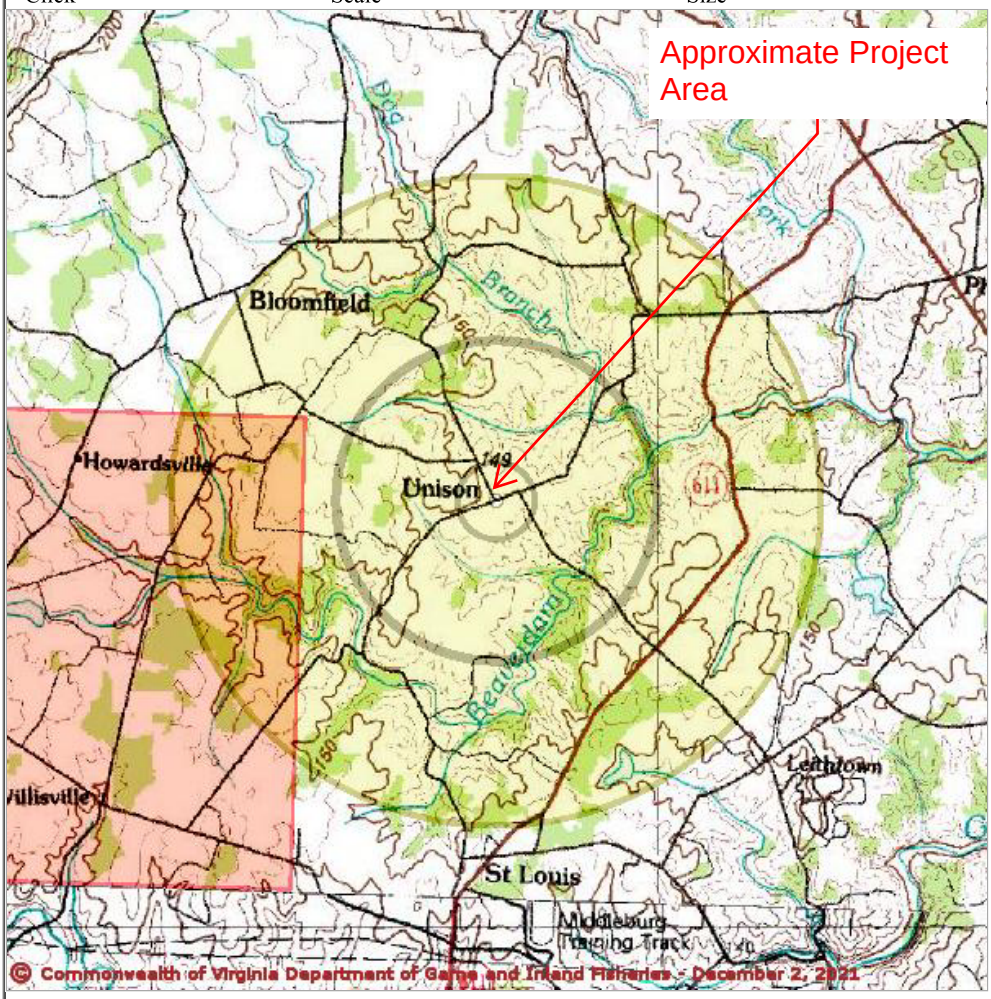
Position Rings 1 mile and 1/4 mile at the Search Point

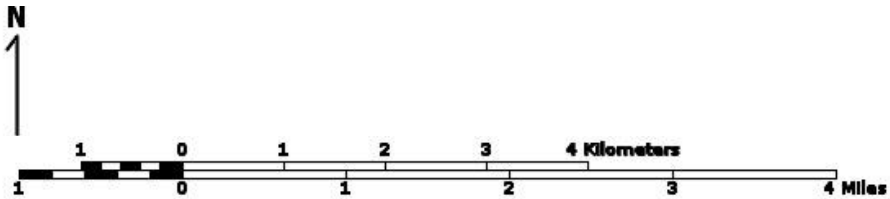
2 mile radius Search Area

Data Observation Site

Refresh Browser Page

Map Click: Pan Id M | Map Scale: In Zoom Out | Screen Size: Small Size Big | Help





Point of Search 39,02,05.8 -77,47,25.9
Map Location 39,02,05.8 -77,47,25.9

Select **Coordinate System:**
(●) Degrees,Minutes,Seconds Latitude - Longitude
( ) Decimal Degrees Latitude - Longitude
( ) Meters UTM NAD83 East North Zone
( ) Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 253663 and top 4329162. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5

	square miles. Topographic maps and Black and white aerial photography for year 1990+- are from the United States Department of the Interior, United States Geological Survey. Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network. Shaded topographic maps are from TOPO! ©2006 National Geographic http://www.national.geographic.com/topo All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries. map assembled 2021-12-02 09:27:39 (qa/qc March 21, 2016 12:20 - tn=1150904.1 dist=3218 I) $poi=39.0349600 -77.7905399$query=select minx,miny,maxx,maxy from vafwis_tables.dbo.bba_qb_summary where qb = '48215'

Appendix B

Cultural Resources

Dewberry

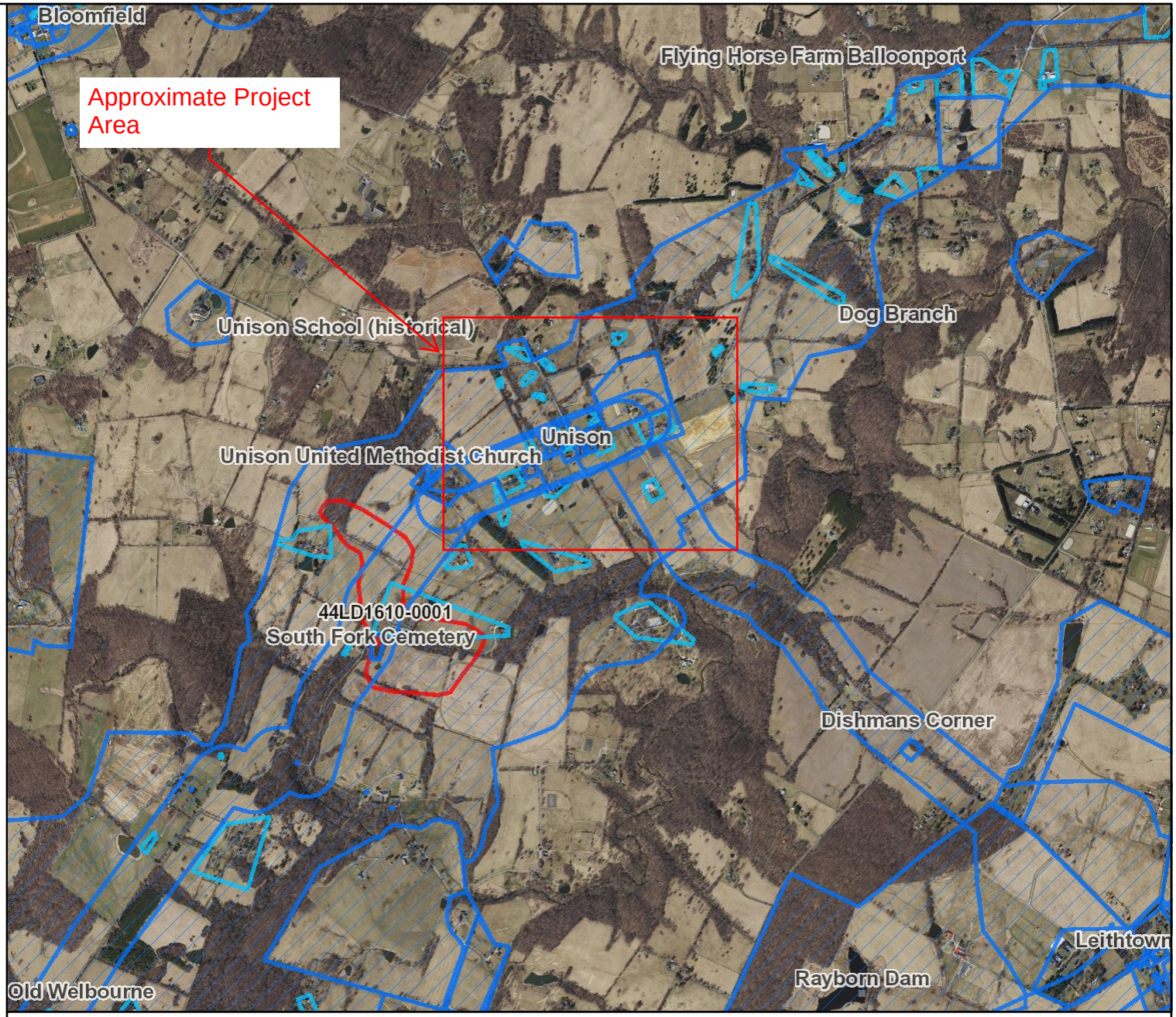
Virginia Dept. of Historic Resources

V-CRIS

Virginia Cultural Resource Information System

Legend

- Architecture Resources
- Individual Historic District Properties
- Archaeological Resources
- Archaeology Labels
- DHR Easements
- USGS GIS Place names
- County Boundaries



N

Feet

0 600 1200 1800 2400

1:36,112 / 1"=3,009 Feet

Title: Unison Village VCRIS Map **Date: 12/2/2021**

DISCLAIMER:Records of the Virginia Department of Historic Resources (DHR) have been gathered over many years from a variety of sources and the representation depicted is a cumulative view of field observations over time and may not reflect current ground conditions.The map is for general information purposes and is not intended for engineering, legal or other site-specific uses. Map may contain errors and is provided "as-is". More information is available in the DHR Archives located at DHR's Richmond office.

Notice if AE sites:Locations of archaeological sites may be sensitive the National Historic Preservation Act (NHPA), and the Archaeological Resources Protection Act (ARPA) and Code of Virginia §2.2-3705.7 (10). Release of precise locations may threaten archaeological sites and historic resources.

Property Information

Property Names

Name Explanation	Name
NRHP Listing	Unison Battlefield Historic District
Historic/Current	Battle of Unison Battlefield District

Property Addresses

Current - John Mosby Highway Route 50
Alternate - Quaker Lane Route 630
Alternate - Greengarden Road Route 719
Alternate - Trappe Road Route 619
Alternate - Unison Road Route 630
Alternate - Wellbourne Road Route 743
Alternate - Willisville Road Route 623
Alternate - JEB Stuart Road Route 630

County/Independent City(s): Fauquier (County), Loudoun (County)

Incorporated Town(s): *No Data*

Zip Code(s): 20117, 20132, 20135, 20141, 20184

Magisterial District(s): *No Data*

Tax Parcel(s): *No Data*

USGS Quad(s): ASHBY GAP, BLUEMONT, LINCOLN, RECTORTOWN, UPPERVILLE

Property Evaluation Status

NRHP Listing
VLR Listing

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural

Acreage: 8,000

Site Description:

2005: Located between Upperville and Middleburg, north of Route 17/50, west of Route 611, south of Route734 and east of Route 601. The battlefield lies within Unison HD as well as to the southwest of the town. An encroaching development parcel is located to the northwest of the battlefield.

2008: Dwellings, barns, church, cemetery, stonewall-lined dirt roads. This was one of the first five Quaker farming settlements in Loudoun County in the 1730s; by the late 1700s it was known as Butterland (many residents paid taxes to the British in butter from large dairy herds), Greeneland and then Union. There are some houses and outbuildings dating from the 1700s, numerous houses, barns and outbuildings constructed in the 1800s, fewer than 50 homes built in the past 50 years (no subdivisions), and original dirt roads with stone walls throughout the core battlefield area all largely unchanged since the mid-1800s. A stream ford still exists on Jeb Stuart Road across the North Fork of Beaverdam Creek. The Quaker cemetery (South Fork Friends Cemetery) dates from the mid-1700s. The South Fork Friends Meeting (1746), was closed in 1889 and demolished c. 1900; the brick Unison United Methodist Church (1832) is built on the site of a 1785 log chapel, the second Methodist Church in Loudoun County. The present church was used as a Union hospital during the Battle of Unison and has soldiers' inscriptions still visible on its interior walls. The Village of Unison (Union until 1829) was the fourth largest town in Loudoun County until the Civil War. It is an historic center for fox hunting in America, as George Washington and Lord Fairfax hunted in the area and since the 19th Century Unison has been home to the Unison Farmers Hunt and the Piedmont Hunt, the nation's oldest fox hunting organization. Many houses and barns in and around Unison were destroyed during the Battle of Unison.

Until the Civil War, Unison was a successful farming and dairy land, a commercial village and a busy crossroads: Route 626 (Foxcroft and Bloomfield roads) connected Middleburg with Snickersivlle gap in the Blue Ridge Mountains and Route 630 (Unison Road) connected the Leesburg area with Upperville and Ashby Gap over the Blue Ridge at Paris. In Unison prior to the war there were schools, two stores, three doctors, lawyers, a gun factory, taverns and a temperance society, and wooden sidewalks. Numerous buildings were burned during the 1862 Battle of Unison, when the population was over 300. After the war the population was less than 100.

By the 20th Century new roads had bypassed Unison, stores went out of business and residents left the village. One of the few things that prospered was fox hunting, spurred by an influx of out-of-state residents to this scenic area, largely from New York. One of the most popular saddles in the East was made in Unison. The horses and hounds of the Piedmont Hunt met regularly in the village and today still regularly cross the Unison Battlefield.

2008 PIF: The potential boundaries of this Loudoun County battlefield district, in the foothills of the Blue Ridge Mountains, have been mapped by NPS historian and cartographer David Lowe under a previous ABPP grant. The outline, a largely linear core battlefield area of 4,322 acres, in three close together sections, and a study area of 12, 541 acres. The core area is primarily rolling pasture and woodland, with small rural villages, including the early Quaker village of Unison already listed on the state and national registers. The study area includes historic road corridors around Unison and includes the villages of Philomont, Bloomfield, Upperville, and Paris. The area, especially the core area, has been called unusually "pristine" by historians, partly because of little development and for its amazing intact network of historic dirt roads, virtually unchanged since the Civil War.

2011 Nomination, Setting and Landscape Features: The Unison Battlefield Historic District is primarily located in the lower southwest portion of Loudoun County within the Loudoun Valley, an eight-to twelve-mile-wide and nearly forty-mile-long valley framed by the Blue Ridge Mountains to the west and the topographically lower Catoctin-Bull Run Mountains to the east. A continuation of Maryland's Middletown (historically, Catoctin) Valley, the northern end of the Loudoun Valley is defined by the Potomac River while its southern terminus is marked by the northern Fauquier County region known as the Broken Hills. The rolling terrain within the Loudoun Valley is marked by numerous hills, ridges, and intervening stream valleys and is fairly typical of Virginia's Piedmont physiographic province.

Despite an underlying north-south trending geology, the lower Loudoun Valley and the Unison Battlefield area are traversed by the generally eastward flowing headwaters and tributaries of Goose Creek, the primary course of which joins the Potomac River just east of Leesburg. Within the Unison Battlefield Historic District, Beaverdam Creek, which joins with Goose Creek at the eastern margin of the Loudoun Valley, and its tributaries are the principal watercourses; the southernmost portion of the battlefield is drained by Pantherskin Creek, a direct tributary of Goose Creek proper. Although the Loudoun Valley's flanking mountains create a broad, natural north-south corridor, the hydrological system of the lower Valley with its numerous cross-cutting stream valleys and intervening ridges present regular obstacles that, particularly from a military perspective, break-up and condition north-south movement while concurrently providing multiple natural settings that could be exploited defensively to further inhibit such movement. In fact, Confederate forces repeatedly took advantage of these natural topographical features of the lower Loudoun Valley during the three-day Battle of Unison.

Because of the nature of the Confederate objective, the three-day Battle of Unison consisted of a southward-shifting series of expediently-formed Confederate defensive lines that took advantage of natural landscape features and topography and elements of the built landscape such as roads, stone walls, and structures to temporarily engage and temporarily slow the more numerous advancing Union forces. With the inevitable forward progress of the Union troops, the Confederates would withdraw south to the next location that offered a defensible position. While the battle's progress southward generally was centered along what is now Unison Road (Route 630), the Confederate defensive lines typically extended outward both east and west of the road to form a broad (up to half-mile long) but shallow front in opposition to the Union forces. Engagements typically lasted no more than several hours before Union pressure at their flanks forced the Confederates to shift the field of battle again.

Although suburban, commercial, and industrial development pushed steadily through eastern Loudoun County during the past half-century, the county's western portions remain largely rural. The use of the land today is primarily devoted to horse rearing, although historically the agricultural uses were more diversified. Nevertheless, southwestern Loudoun County and the Unison Battlefield Historic District area in particular look much the same as they did as in 1862. The landscape is fairly open and is characterized by fenced fields, copses of trees in isolated locations, and rolling hills cut by creeks and small drainages. Specifically, the area's extant network of largely unpaved, narrow roads and the extensive grid of dry-laid field stone walls that divide the terrain into a mosaic of fields and wood lots appear to retain significant integrity, and both in location and construction, seem little altered since the mid-19th century. Although a considerable number of residences and agricultural buildings have been constructed within the battlefield area since the Civil War, many of the buildings standing at the time of the Battle of Unison remain. In this sense, the Unison Battlefield Historic District is differentiated from other Civil War battlefields in Virginia in that it possesses an extremely pristine landscape closely comparable to the one that framed and lent structure to the movement and engagement of Confederate and Federal forces in early November 1862. The 1853 Yardley Taylor Map of Loudoun County and William P. Smith's 1863 "Map of Fauquier and Loudoun Counties, Virginia" clearly show old roads and communities that were in place during the battle. A comparison with modern maps reveals that most of these elements remain intact today. As David Lowe stressed in his 2008 history, "those who fought [here] in 1862…would recognize their battlefield today."

Boundary Justification: The boundaries as described above enclose the area within which the Battle of Unison occurred on November 1–3, 1862, according to David Lowe's authoritative analysis and description of the terrain. The area enclosed includes the terrain over which the actions took place that constitute the battle. These actions include the clashes that occurred between the Union cavalry and reinforcements and the Confederate cavalry along the principal routes of engagement: between Philomont and the Ashby's Gap Turnpike (present-day U.S. Route 50) along J. E. B. Stuart Road, Unison Road, Quaker Lane, Willisville Road, and Greengarden Road; the route along which the 9th Virginia Cavalry and 8th Pennsylvania Cavalry engaged east of the principal routes, along Bloomfield and Trappe Roads between the Ebenezer Churches (where that engagement began) and Upperville; and the route of the Confederate retreat and Federal pursuit along and adjoining present-day U.S. Route 50 from approximately the intersection with Rokeby Road on the east through Upperville to the point at which the Federal pursuit ended about two miles west of the center of Upperville. To account for the military probability that offensive and defensive lines during advances and retreats extended for some distance outside the roadway, the boundaries were established about two hundred yards outside the center lines of roads along the district's edges.

Surveyor Assessment:

Edward Bearrs, chief historian for NPS, writes the following:

"In and around Unison a modest band of Confederate cavalry and horse artillery under the command of J.E.B. Stuart was charged with protecting Robert E. Lee's tired Army after the bloody thrashing it received at Antietam and giving it the time it needed to regroup further south. Alfred Pleasonton and his troops did their best to open a path through Unison for McClellean and the entire Army of the Potomac to launch flanking maneuvers against Lee, but were delayed sufficiently to allow Lee's forces to escape. All of this happened in and around this off-the-beaten-track village located in an area of Northern Virginia where dirt roads, stone walls, and gorgeous open meadows still abound.

As a direct result of these October-November 1862 cavalry battles in and around Unison, President Lincoln was thwarted in his determination that Gen. George McClellan move rapidly through the Loudoun Valley, and seal the Blue Ridge gaps, to outflank Gen. Lee's forces and cut them off from Richmond. This was quickly followed by Lincoln's removal of McClellan from command, an event signalling a major change in the President's public policy.

At the moment, the roads, stone walls and many structures in and around Unison remain as they were in 1862..."

Battle took place Nov. 1-5, 1862.

2008: The little studied Nov. 1-3, 1862, Battle of Unison, following the Battle of Antietam, involved modest numbers, but has national significance in that the President of the United States, acting as commander in chief, designed the battle plan himself. The president hoped it might cut off Lee's Army from Richmond, possibly result in the capture of the Confederate capital (McClellan's forces were at least 50 miles closer to Richmond) and perhaps even bring an early end to the Civil War. When the plan failed, due primarily to

Lee's correctly reading his military opponent and the significant delaying actions of Gen. J.E.B. Stuart's small force of cavalry and artillery, Lincoln removed McClellan from command. The battle has been described as one of the first effective uses of Union cavalry at brigade strength, as well as an excellent example of mobile artillery use by John Pelham. The near eight-mile long battlefield is almost entirely on the original dirt roads, with the original ford across North Branch on what is now JEB Stuart Road. It is in what state historians have called "pristine" condition, with Civil War era buildings, stone walls, open fields, many historic houses and buildings, relatively few new houses and no subdivisions. It provides historians and the public with an amazingly authentic historic area. As Lowe states, "Those who fought here in 1862 would immediately recognize their battlefield today."- Battle of Unison, (p.3). The foregoing was well documented in Patrick Brennan's article "Little Mac's Last Stand" in the December 1999 issue of Blue and Gray Magazine and more fully studied and mapped in David Lowe's report, the final draft of which has been submitted to DHR with accompanying maps and a 45-photo pictorial summary of the battle, with mapped photo locations.

2008 PIF: The little studied Nov. 1-3, 1862, Battle of Unison, following the Battle of Antietam, involved modest numbers, but has national significance in that the President of the United States, acting as commander in chief, designed the battle plan himself. The president hoped it might cut off Lee's Army from Richmond, possibly result in the capture of the Confederate capital (McClellan's forces were at least 50 miles closer to Richmond) and perhaps even bring an early end to the Civil War. When the plan failed, due primarily to Lee's correctly reading his military opponent and the significant delaying actions of Gen. J.E.B. Stuart's small force of cavalry and artillery, Lincoln removed McClellan from command. The battle has been described as one of the first effective uses of Union cavalry at brigade strength, as well as an excellent example of mobile artillery use by John Pelham. The near eight-mile long battlefield is almost entirely on the original dirt roads, with the original ford across North Branch on what is now JEB Stuart Road. It is in what state historians have called "pristine" condition, with Civil War era buildings, stone walls, open fields, many historic houses and buildings, relatively few new houses and no subdivisions. It provides historians and the public with an amazingly authentic historic area. As Lowe states, "Those who fought here in 1862 would immediately recognize their battlefield today."- Battle of Unison, (p.3). The foregoing was well documented in Patrick Brennan's article "Little Mac's Last Stand" in the December 1999 issue of Blue and Gray Magazine and more fully studied and mapped in David Lowe's report, the final draft of which has been submitted to DHR with accompanying maps and a 45-photo pictorial summary of the battle, with mapped photo locations.

2011 Nomination Statement of Significance: The Unison Battlefield Historic District is located in western Loudoun County and northern Fauquier County, generally along and north of U.S. Route 50 and just east of the Blue Ridge Mountains. There, on November 1–3, 1862 Union and Confederate cavalry detachments fought a series of engagements in the Loudoun Valley near the town of Unison (also called Union), which gave the battlefield its name. Confederate Major General J. E. B. Stuart's cavalry successfully delayed Union Brigadier General Alfred Pleasonton's cavalry, which was leading Major General George B. McClellan's Army of the Potomac south from Philomont under a battle plan that President Abraham Lincoln proposed. The Federal commander, therefore, failed to execute Lincoln's plan to confine and attack Gen. Robert E. Lee's infantry in the Shenandoah Valley or block and attack it if it marched across McClellan's front from the Valley east to Culpeper County. This was the final straw in the president's repeated attempts to motivate McClellan to attack Lee. Lincoln replaced McClellan with Major General Ambrose E. Burnside two days later (November 5, 1862). The Battle of Unison is, therefore, of national significance in Civil War military history because of its immediate consequence: the removal of Major General George B. McClellan from command of the Army of the Potomac two days after the battle. The battlefield's archeological integrity is also intact, as shown by recent archeological investigations that were part of this nomination.

Justification of Criteria: The Unison Battlefield Historic District is eligible for listing in the National Register of Historic Places as nationally significant under Criterion A for its association with Civil War military history, specifically for the Battle of Unison and its consequences resulting in President Abraham Lincoln's removal of Major General George B. McClellan from command of the Army of the Potomac. The historic landscape remains largely intact and retains exceptional integrity of location, association, setting, feeling, design, and materials. In addition to the landscape, the battlefield incorporates man-made features including historic farmsteads, roads, fences, and buildings. The battlefield is also eligible under Criterion D for its archeological significance. Recent investigations of a fifty-acre study area at Fiddler's Green/South Fork Quaker Meeting House near the center of the battlefield have demonstrated that sufficient archaeological resources remain intact to yield information about the
battle, troop movements, and offensive and defensive positions. Unison Battlefield Historic District meets the registration requirements outlined in the Multiple Property Documentation Form entitled The Civil War in Virginia, 1861–1865: Historic and Archaeological Resources. The period of significance is November 1–3, 1862, because the series of engagements that constituted the battle began on November 1 and ended on November 3.

See nomination for Historical Background.

Surveyor Recommendation: Recommended Eligible

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category:	Other
Resource Type:	Historic District
NR Resource Type:	District
Historic District Status:	Contributing
Date of Construction:	Ca 1730
Date Source:	Site Visit/Written Data
Historic Time Period:	Contact Period (1607 - 1750)
Historic Context(s):	Architecture/Landscape, Domestic, Military/Defense, Settlement Patterns, Subsistence/Agriculture
Other ID Number:	*No Data*

Architectural Style: Mixed (more than 3 styles from different periods, 0)

Form: *No Data*

Number of Stories: *No Data*

Condition: Good

Threats to Resource: Development

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

2008: The core area of this largely linear battlefield historic district is in the foothills of the Blue Ridge Mountains. It is almost eight miles long, ranging from a few hundred yards wide to more than a mile wide, and comprises about 4,480 acres. The mapping and history of the 1862 Battle of Unison (drafts submitted), are now being completed by NPS cartographer and historian David Lowe, under a grant from the American Battlefield Protection Program. Lowe's final boundaries, though subject to change during the historic district nomination process, may well differ. We expect to know the boundaries shortly. The core area of the battlefield is almost completely rural, made up of small and large farms. It has a bucolic, pastoral air, not surprising since most of the open land is in pasture, with small copses or woods. Although the proposed battlefield is rural, it starts in a village, Philomont, goes through the village of Unison and the largely post Civil War village of Willisville. The battlefield area has been described as "pristine" by historians who recently toured the battlefield. Loudoun historian Eugene Scheel calls it one of the best-preserved Ante-Bellum rural places in Virginia. Lowe's draft history of the Battle of Unison describes it as a place Union and Confederate soldiers from 1862 would clearly recognize today as the place they fought in. Most of the buildings within the proposed district (42 in the core area alone) and in the existing Unison Village Historic District (44 documented) are pre Civil War. There are dozens of early fieldstone Quaker farmhouses. Fewer than 50 new non-contributing buildings, and no subdivisions. But the most noticeable feature to visitors, and perhaps the defining characteristic of the Unison Battlefield, is its roads. Virtually all roads within the core battlefield area are still dirt, most lined with historic stone walls. The roads are virtually unchanged since the Civil War. The ford over North Fork (on JEB Stuart Road) still exists, looking almost exactly as it did on Nov. 1, 1862, when Union and Confederate forces fought across it. This amazing number of original dirt roads is a major reason that Loudoun County, in 2002, created the Beaverdam Creek Historic Roadways District. The proposed battlefield is largely within that district and the one section that is not, near Philomont, has been proposed for inclusion.

What are the current uses? -- Surrounding the village of Unison, are now mostly small horse and cattle farms, and some tree farms. The area is traditionally described as horse country and hunt country. Much of the land is under conservation easement, in (temporary) agricultural or forestal districts or in holdings that cannot be subdivided under recently passed county zoning. Most houses in the village of Unison, and the Unison Store in the center of the village, have been restored.

Architectural styles or elements of buildings within the proposed district -- Vernacular. There are dozens of early Quaker fieldstone houses, as well as some early log, brick and clapboard buildings (1775-1850); a few large early barns (many were destroyed in the Civil War); and with many clapboard Victorian-style houses built from the late 1800s to 1920 (including the village schoolhouse, now a home, and the Unison Store). The roads within the core battlefield area are almost all dirt and mostl are lined with stone walls. The roads and the proposed battlefield are almost all within the Loudoun County Beaverdam Creek Historic Roadways District.

Architects, builders, or original owners of buildings within the proposed district -- Largely unknown. Many of the early Quaker fieldstone buildings were reportedly constructed by teams of builders from Pennsylvania (where Loudoun's Quaker and German settlers came from). Similar building designs and even similar interior mantels and woodwork are found in many houses in and around Unison. The Unison area still has descendants of many of the families who lived here more than 100 years ago, most still living on their historic family farms, including Monroes, Ballengers, Furrs and Beavers.

Are there any known threats to this district?The Unison Preservation Society was founded in 2001, and the Unison Village Historic District in 2002, primarily to save the 1870s Unison store, then threatened with demolition. It was saved and has since been restored to National Park Service standards, as has another building in the village. Two years ago a 28-house subdivision was proposed adjacent to the historic district. UPS successfully slowed and blocked that and its entire 100 acres are now under easement with only one house permitted on the property. Last fall a Unison resident on Foxcroft Road announced plans for a large cell phone tower, also adjacent to the village historic district. He has apparently now backed off that proposal. Across Foxcroft Road, however, a developer bought 100 acres of the historic Ballenger Farm and proposes putting at least 4-6 houses on it. It is now for sale and the developer has talked about putting the property under easement when it comes out of its current Ag District designation this summer.

2011 NRHP nomination Historic District Summary Description: The Unison Battlefield Historic District encompasses 8,000 acres of pristine, rural Virginia Piedmont countryside. Located in the lower Loudoun Valley, the historic district stretches from just south of the village of Philomont southwest to Upperville located on the Ashby's Gap Turnpike (U.S. Route 50). This area experienced a series of engagements known collectively as the Battle of Unison that were fought over the course of three days in early November 1862. The majority of the battlefield district is located in southwestern Loudoun County, but the portion within the village of Upperville and points west, falls within Fauquier County. The battlefield district also extends north of Upperville along both sides of Trappe, Greengarden, and Airmont roads to include routes of significant troop movements integral to the battle.

The boundaries of the Unison Battlefield Historic District encompass the core area of the battle as identified in National Park Service Historian and Cartographer David Lowe's 2008 history of the battle as well as the retreat corridor west along the Ashby's Gap Turnpike (also known as the Winchester-Alexandria Turnpike) through Upperville, ending finally at a point nearly halfway to Paris. The arm that extends north of Upperville to the Ebenezer Baptist Churches along Airmont Road and part of Trappe and Millville roads represents significant troop movements that were critical to the delay tactics employed in the battle. The resulting district is therefore U-shaped.

Although primarily located in one of the fastest-growing counties in the nation, the Unison Battlefield Historic District is regarded as one the best-preserved battlefield historic districts in Virginia and possibly in the nation. Today more than half of the acreage within the battlefield district is held in conservation easements. The road network within the district, still comprised largely of pre-modern unpaved roads, is also remarkably little changed since the battle. Most roads follow the original road beds present in 1862 and are flanked by dry-laid stone walls. Where the roads have been modified and improved, the old beds have been preserved and are still clearly visible. The original dirt-road ford of the North Fork of Beaverdam Creek along Jeb Stuart Road continues to function as a ford, exactly as it did in 1862. Elsewhere, although not dating from the Civil War era, the many narrow, formed-concrete bridges within the district date to the first quarter of the 20th century and enhance the historic appearance of the road networks. The Beaverdam Creek Historic Roadways District, established as a local overlay district by Loudoun County in 2002, includes many of the roads within the Unison Battlefield Historic District, further ensuring their preservation.

The Unison Battlefield Historic District also contains two previously listed National Register Historic Districts: the Unison Historic District [053-0692], listed in 2003 that encompasses roughly 70 acres in and around the village of Unison; and a portion of the Upperville Historic District [030-5438], a linear district that takes in the community of Upperville located along the former Ashby‘s Gap Turnpike (U.S. Route 50). The Middleburg Battlefield [053-5057] and the Upperville Battlefield Historic District [030-5438], both of which have been determined eligible for listing in the Virginia Landmarks Register and the National Register of Historic Places, partially overlap the Unison Battlefield Historic District.

Five individually-listed properties also lie within the boundaries of the Unison Battlefield Historic District and contain resources present during the Battle of Unison. These include Ebenezer Baptist Churches [053-0140; 053-6087-0211], Crednal [053-0141; 053-6087-0062], Welbourne [053-0120; 053-6087-0174], Rock Hill [053-1057; 053-6087-0199], and Green Garden [053-0509; 053-6087-0184]. The integrity of the Unison Battlefield Historic District is confirmed not only by its setting in a rolling topography with a highly preserved rural landscape dotted with historic resources and an intact road network, but also by the presence of relatively few modern intrusions. The modern development that has occurred within the battlefield is generally limited to dwellings and farm- and horse-related outbuildings that stand on parcels subdivided from larger tracts. No modern commercial development has occurred. The battlefield‘s archeological integrity is also intact, as supported by recent archeological investigations that were part of this nomination.

See nomination for additional details.

Secondary Resource Information

Secondary Resource #1

Resource Category:	Defense
Resource Type:	Battle Site
Date of Construction:	1862Ca
Date Source:	Written Data
Historic Time Period:	Civil War (1861 - 1865)
Historic Context(s):	Architecture/Landscape, Domestic, Military/Defense, Settlement Patterns, Subsistence/Agriculture
Architectural Style:	No Discernable Style
Form:	*No Data*
Condition:	Excellent
Threats to Resource:	Development
Cultural Affiliations:	*No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

2005: Pristine battlefield under threat of encroaching development.

2008 PIF: The core area of this largely linear battlefield historic district is in the foothills of the Blue Ridge Mountains. It is almost eight miles long, ranging from a few hundred yards wide to more than a mile wide, and comprises about 4,480 acres. The mapping and history of the 1862 Battle of Unison (drafts submitted), are now being completed by NPS cartographer and historian David Lowe, under a grant from the American Battlefield Protection Program. Lowe’s final boundaries, though subject to change during the historic district nomination process, may well differ. We expect to know the boundaries shortly. The core area of the battlefield is almost completely rural, made up of small and large farms. It has a bucolic, pastoral air, not surprising since most of the open land is in pasture, with small copses or woods. Although the proposed battlefield is rural, it starts in a village, Philomont, goes through the village of Unison and the largely post Civil War village of Willisville. The battlefield area has been described as “pristine” by historians who recently toured the battlefield. Loudoun historian Eugene Scheel calls it one of the best-preserved Ante-Bellum rural places in Virginia. Lowe’s draft history of the Battle of Unison describes it as a place Union and Confederate soldiers from 1862 would clearly recognize today as the place they fought in. Most of the buildings within the proposed district (42 in the core area alone) and in the existing Unison Village Historic District (44 documented) are pre Civil War. There are dozens of early fieldstone Quaker farmhouses. Fewer than 50 new non-contributing buildings, and no subdivisions. But the most noticeable feature to visitors, and perhaps the defining characteristic of the Unison Battlefield, is its roads. Virtually all roads within the core battlefield area are still dirt, most lined with historic stone walls. The roads are virtually unchanged since the Civil War. The ford over North Fork (on JEB Stuart Road) still exists, looking almost exactly as it did on Nov. 1, 1862, when Union and Confederate forces fought across it. This amazing number of original dirt roads is a major reason that Loudoun County, in 2002, created the Beaverdam Creek Historic Roadways District. The proposed battlefield is largely within that district and the one section that is not, near Philomont, has been proposed for inclusion.

Historic District Information

Historic District Name:	Unison Battlefield Historic District
Local Historic District Name:	Unison Historic District
Historic District Significance:	*No Data*

CRM Events

Event Type: NRHP Listing

DHR ID: 053-6087
Staff Name: NPS
Event Date: 11/22/2011
Staff Comment

VIRGINIA, LOUDOUN COUNTY, Unison Battlefield Historic District, Parts of Quaker Ln., Jeb Stuart, Unison, Newlin Mill, Millville, Bloomfield, Welbourne, Greengarden Rds., Unison, LISTED, 11/22/11 – DHR File Number 053-6087.

Event Type: VLR Listing

DHR ID: 053-6087
Staff Name: State Review Board
Event Date: 9/22/2011
Staff Comment

No Data

Event Type: NRHP Nomination

DHR ID: 053-6087
Staff Name: Maral S. Kalbian, LLC
Event Date: 5/17/2011
Staff Comment

Maral S. Kalbian, Architectural Historian; John Salmon, Historian; Ben Ford and Steve Thompson - Rivanna Archaeological Services, LLC

Event Type: DHR Board: Eligible

DHR ID: 053-6087
Staff Name: State Review Board
Event Date: 3/20/2008
Staff Comment

Board Comments: Chair Moore asked about past or current archaeological survey in the district, and Paul Hodge reported that some had taken place, though not on an extensive professional basis.

Event Type: DHR Staff: Eligible

DHR ID: 053-6087
Staff Name: DHR Evaluation Committee
Event Date: 1/24/2008
Staff Comment

The proposed district is a 4322 acre linear area covering the battlefield of the 1862 Battle of Unison, which resulted in the relieving of command of Union General McClellan and allowed the Confederate army time to prevent early Union movement to Richmond. The core area is almost completely rural, occupied by farms of varying sizes with intact viewsheds. Most standing resources are antebellum, including early Quaker houses and the remains of a Quaker meetinghouse and cemetery. Exact boundaries are still being devised, through a study with an ABPP grant. The district was evaluated as locally significant under Criteria A (Early Settlement, Agriculture, Military) and C (Architecture) with a period of significance of c.1730-1958. The committee recommended proceed to listing with 36 points. It also suggested consideration of a larger rural historic district including the battlefield area.

Event Type: PIF

Project Review File Number: *No Data*
Investigator: Paal Hodge
Organization/Company: Unknown (DSS)
Photographic Media: Film
Survey Date: 1/22/2008
Dhr Library Report Number: *No Data*
Project Staff/Notes:

President, Unison Preservation Society
PIF evaluation explanation:
1.) To bring recognition to this Civil War battlefield, unusual in its pristine historic condition, with little development and significant restoration, preservation and easements to protect its historic properties. It contains a well preserved network of historic dirt roads that are

largely the same as they were at the time of the Civil War.
2.) To bring recognition to the history of the Nov. 1-3 1862 Battle of Unison, part of a rare battle plan personally devised by the President of the United States. Had Lincoln's plan succeeded, it might have hastened the end of the Civil War. Because of delaying tactics by a small force under Confederate Gen. J.E.B. Stuart, the plan was foiled. Lincoln immediately removed McClellan from command after the Battle of Unison.
This nomination project is being funded by the nonprofit Unison Preservation Society under a major grant, application pending, from the American Battlefield Protection Program. Under an earlier grant, ABPP funded the mapping and history of the Battle of Unison, which is now being completed by NPS historian and cartographer David Lowe.

Surveyor's NR Criteria Recommendations: A - Associated with Broad Patterns of History, D - Potential to Yield Important Historic and/or Pre-Historic Information

Phase II Intensive Survey Integrity Recommendations: Feeling, Location, Setting

Event Type: DHR Staff: Potentially Eligible

DHR ID: 053-6087

Staff Name: DHR Evaluation Committee

Event Date: 12/1/2005

Staff Comment

Robert Carter presenting:
Unison Battlefield, Loudoun County, DHR File 053-6087
With a period of significance of 1862, the Unison Battlefield is located near, and partly in, the town of Unison. The battle occurred in stages. Occurring following the Battle of Antietam, Lee ordered a delaying tactic by engaging Federal troops as they followed the Confederates, who were pulling back to the south. The map presented showed various nodes where the conflict was more intense. The team asked that the battlefield nodes get transferred to DHR mapping systems. While there was not enough data to fully rate this resource, it would most likely qualify as statewide significance under Criteria A (Military) (Carter would check with Civil War historian John Salmon to determine level of significance). The committee recommended potentially eligible for listing.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Historic	Upperville Battlefield

Property Addresses

Current - John S. Mosby Highway
Alternate - Route 50

County/Independent City(s): Fauquier (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20184
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): RECTORTOWN, UPPERVILLE

Property Evaluation Status

DHR Staff: Potentially Eligible

This Property is associated with the Upperville Historic District.

Additional Property Information

Architecture Setting: Village
Acreage: *No Data*
Site Description:

The battlefield of Upperville is in a remarkable state of preservation. For the most part, Route 50 retains its historic alignmnet and provides an excellent compass for understanding the fighting. The area retains a rural character with development restricted to single family homes. Generally, the ground in more open then at the time of the Civil War. Tree lines significant to the battles have been removed or altered.

Surveyor Assessment:

Start Year: 1863
Date Source: Site Visit
Type: Historical Event

On June 21, Union cavalry made a determined effort to pierce Stuart's cavalry screen. Hampton's and Robertson's brigades made a stand at Grove Creek, west of Middleburg, and beat back Gregg's division. Buford's column detoured to attack the Confederate left flank near Upperville, but encountered William E. "Grumble" Jones's and John R. Chambliss's brigades while J.I. Gregg's and Kilpatrick's brigades advanced on Upperville from the east along the Little River Turnpike. After furious mounted fighting, Stuart withdrew to take a strong defensive position in Ashby Gap, even as Confederate infantry crossed the Potomac into Maryland. As cavalry shirmishing diminished, Stuart made the fateful decision to strike east and make a circuit of the Union army as it marched towards Gettysburg.

Surveyor Recommendation: Legacy

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Defense
Resource Type: Battle Site
NR Resource Type: Site
Historic District Status: Contributing
Date of Construction: 1863
Date Source: Site Visit
Historic Time Period: Civil War (1861 - 1865)
Historic Context(s): Military/Defense
Other ID Number: *No Data*
Architectural Style: No Discernable Style
Form: *No Data*
Number of Stories: *No Data*

Condition: Good

Threats to Resource: Deterioration, Development

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

The battlefield of Upperville is in a remarkable state of preservation. For the most part, Route 50 retains its historic alignment and provides an excellent compass for understanding the fighting. The area retains a rural character with development restricted to single family homes. Generally, the ground in more open then at the time of the Civil War. Tree lines significant to the battles have been removed or altered.

The current site is composed of monuments/plaques, road beds, structures, stone walls, and buildings. The current land usage is agricultural and residential in nature.

Secondary Resource Information

Historic District Information

Historic District Name: Upperville Historic District

Local Historic District Name: *No Data*

Historic District Significance: *No Data*

CRM Events

Event Type: DHR ID Number Change

DHR ID: 030-5440

Staff Name: DHR Archives

Event Date: 10/14/2007

Staff Comment

The property was once recorded under the Fauquier-Upperville DHR File Number of 400-5001. It is now changed to the Fauquier County DHR File Number of 030-5440. Upperville is not an incorporated town.

Event Type: Other

Project Review File Number: *No Data*

Investigator: ABPP

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/24/2007

Dhr Library Report Number: Report on the Nation's Civil War Battlefields

Project Staff/Notes:

Preliminary survey data from the American Battlefield Protection Program (ABPP) indicates that this historic Civil War battlefield is likely eligible for listing in the National Register of Historic Places and likely deserving of future preservation efforts. This survey information should be reassessed during future Section 106/NEPA compliance reviews.

Project Bibliographic Information:

Name: Civil War Sites Advisory Commission
DHR CRM Report Number: Report on the Nation's Civil War Battlefields
Record Type: Book
Bibliographic Notes: Includes 3 books - Report, Volume I: Appendices, and Volume II: Battle Summaries
---
Name: Lowe, David
DHR CRM Report Number: LD-175
Record Type: Report
Bibliographic Notes: "Civil War in Loudoun Valley: The Cavalry Battles of Aldie, Middleburg, and Upperville, June 1863" --2004

Disc available. A reexamination of the core and study areas of the three cavalry battles in Loudoun Valley: Aldie, Middleburg and Upperville,

which were originally recorded as part of the American Battlefield Protection Program's Civil War Sites Advisory Commission survey of the 1990s.

Surveyor's NR Criteria Recommendations: A - Associated with Broad Patterns of History

Event Type: DHR Staff: Potentially Eligible

DHR ID: 030-5440

Staff Name: Kirchen, Kristin

Event Date: 10/26/2006

Staff Comment

Based on information submitted by Tanya Gossett at the American Battlefield Protection Program, the battlefield is potentially eligible and more information is warranted to fully determine its eligibility.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: CWSAC - VA038

Investigator: CWSAC

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/1993

Dhr Library Report Number: Report on the Nation's Civil War Battlefields

Project Staff/Notes:

Civil War Sites Advisory Commission Survey Form (CWSAC) - contact the American Battlefield Protection Program for additional information on the battlefield and its boundaries.

Project Bibliographic Information:

Name: Civil War Sites Advisory Commission
DHR CRM Report Number: Report on the Nation's Civil War Battlefields
Record Type: Book
Bibliographic Notes: Includes 3 books - Report, Volume I: Appendices, and Volume II: Battle Summaries
---
Name: Lowe, David
DHR CRM Report Number: LD-175
Record Type: Report
Bibliographic Notes: "Civil War in Loudoun Valley: The Cavalry Battles of Aldie, Middleburg, and Upperville, June 1863" --2004

Disc available. A reexamination of the core and study areas of the three cavalry battles in Loudoun Valley: Aldie, Middleburg and Upperville, which were originally recorded as part of the American Battlefield Protection Program's Civil War Sites Advisory Commission survey of the 1990s.

Surveyor's NR Criteria Recommendations: A - Associated with Broad Patterns of History

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Historic/Current	Battle of Middleburg

Property Addresses

Current - John S. Mosby Highway
Alternate - Route 50

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): RECTORTOWN

Property Evaluation Status

DHR Staff: Potentially Eligible

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

March 2020: A survey was carried out on a 570-area lying east of Sam Fred Road and north of John Mosby Highway (Route 50). A 75-foot setback from Sam Fred Road and a 100-foot setback from John Mosby Highway were excluded. Much of the land consisted of cleared fields, with some areas occupied by cattle.

The battle area retains a rural character with development restricted to single family homes. The area provides accessible vantage points from which to view important battle sites. Generally, the ground is more open than at the time of the Civil War. Tree lines significant to the battle have been removed or altered. No interpretation is provided on-site except for state historical highway markers.

Surveyor Assessment:

End Year: 1863
Type: Historical Event
Notes: Battle of Middleburg

The Battle of Middleburg, a cavalry encounter, occurred on June 19th, 1863, and consisted of a running fight that began to delay a Federal advance. The Confederate cavalry made a stand west of Middleburg.

March 2020: A Phase I Metal Detector Survey was carried out on five areas located within the Battle of Aldie boundary. All artifacts recovered within the survey area were considered secondarily deposited or casual refuse and do not constitute an archeological site. No additional work is recommended.

Surveyor Recommendation: Recommended Potentially Eligible

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Defense
Resource Type: Battle Site
NR Resource Type: Site
Historic District Status: *No Data*
Date of Construction: 1863
Date Source: Written Data
Historic Time Period: Civil War (1861 - 1865)
Historic Context(s): Military/Defense
Other ID Number: *No Data*
Architectural Style: No discernible style

Form: *No Data*
Number of Stories: *No Data*
Condition: Good
Threats to Resource: Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

April 1992: Features on site include Little River Turnpike (Route 50) - now a double highway, but the southern portion is historic. Woods perpendicular to the road, stone wall defended by the Confederates, and a landmark blacksmith shop used by Confederate artillery for siting are all no longer extant.

March 2020: The battlefield appears largely unchanged from previous surveys.

Secondary Resource Information

Historic District Information

Historic District Name: *No Data*
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Rebekah Yousaf
Organization/Company: Thunderbird Archeology, a division of Wetland Studies and Solutions, Inc.
Photographic Media: Digital
Survey Date: 3/16/2020
Dhr Library Report Number: *No Data*
Project Staff/Notes:

David Carroll and Kathleen Jockel . Surveyed two previously recorded architectural resources and three unrecorded resources.

Project Bibliographic Information:

Banbury Cross, Phase I Survey, Loudoun County, Virginia.

Surveyor's NR Criteria Recommendations: A - Associated with Broad Patterns of History, D - Potential to Yield Important Historic and/or Pre-Historic Information

Event Type: DHR Staff: Potentially Eligible

DHR ID: 053-5057
Staff Name: ABPP
Event Date: 1/24/2007
Staff Comment

Preliminary survey data from American Battlefield Protection Program (ABPP) indicates that this historic Civil War battlefield is likely eligible for listing in the National Register of Historic Places and likely deserving of future preservation efforts. This survey information should be reassessed during future Section 106/NEPA compliance reviews.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: VA-037
Investigator: Devine, John

Organization/Company:	Unknown (DSS)
Photographic Media:	*No Data*
Survey Date:	4/23/1992
Dhr Library Report Number:	VA-037

Project Staff/Notes:

Civil War Sites Advisory Commission Survey Form (CWSAC) - contact the American Battlefield Protection Program for additional information on the battlefield and its boundaries.

Project Bibliographic Information:

Banbury Cross, Phase I Survey, Loudoun County, Virginia.

Surveyor's NR Criteria Recommendations:	A - Associated with Broad Patterns of History, D - Potential to Yield Important Historic and/or Pre-Historic Information

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21058 Unison Road
Historic/Location	Mildred Shackleford House, 21058 Unison Road

Property Addresses

Current - 21058 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Hamlet
Acreage: .25
Site Description:

1975: Located on a 1/4-acre village lot in Unison.

2001: Mature trees in side yard.

April 2010: The resource has not undergone major changes since the last survey.

2001: None.

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

1975: House in the village of Unison built in the 1800's and according to the current owner, Mrs. Shackleford, "restored" in 1895.

The structure could be an important part of an Historic District, but has little merit on it's own when compared with all those of similar date and period within the Commonwealth.

2001: Historical Significance:
This 2-story brick house is composed of 2 almost identical 3-bay units, each with own central door. They appear to have been constructed in the mid-19th-century and, like many other buildings in Unison, may have had a partial commercial use. The house has a fair amount of architectural integrity although the ridge of a large rear wing is taller than that of the front. The building is a contributing resource to the Unison Historic District.

April 2010: The Unison Battlefield Historic District is significant under Criterion A, relating to the significant Battle of Unison that took place November 1-3, 1862. Along with its outbuildings, pristine setting, and architectural integrity, this property contributes to the overall historic district. The property was part of Phases 3 and 4 of the battle on November 2, 1862. This property also contributes to the Unison Historic District [053-0692].

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Contributing

Date of Construction: Ca 1850
Date Source: Site Visit
Historic Time Period: Antebellum Period (1830 - 1860)
Historic Context(s): Architecture/Community Planning, Domestic
Other ID Number: *No Data*
Architectural Style: *No Data*
Form: *No Data*
Number of Stories: 2.0
Condition: Fair
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

1975: Built in the 1800's and currently in fair condition.

2001: 21058 Unison Road; Mildred Shackelford House (53-692-14; 53-448): ca. 1850, ca. 1985. The front of this 2-story, 6-bay dwelling is the original ca. 1850 portion. It is composed of two three-bay sections each with its own central door flanked by a window. The brick is laid in 5-course American bond and details include interior-end brick chimneys with corbelled caps, 6/6-sash windows, paneled shutters and jack arches over the openings. An obvious seam between the two sections perhaps indicates 2 distinct construction periods. It appears that the left section may have been built earlier. To the rear is a very large modern wing with a ridge line that is taller than that of the front of the house.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Structural System and Exterior Treatment	Masonry	Brick	Bond, American, 5-course
Windows	Sash, Double-Hung	Wood	6/6
Roof	Gable	Asphalt	Shingle
Chimneys	Interior End	Brick	Cap, Corbeled
Foundation	Solid/Continuous	Stone	Rubble, Random

Secondary Resource Information

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: 053-0692-0014
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 12/11/2001
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Windshield

Project Review File Number: 053-0448
Investigator: Edwards, David
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/1983
Dhr Library Report Number: *No Data*
Project Staff/Notes:

photographs in file, but no written survey

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: 053-0448
Investigator: Lewis, John G.
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 4/5/1975

Dhr Library Report Number: *No Data*

Project Staff/Notes:

written survey and detailed floorplans in file, but photographs from site visit have been lost.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21088 Unison Road
Historic	Osbourne's Saddle Shop
Historic	Unison Post Office
Historic/Current	Uncle Tom's Cabin

Property Addresses

Current - 21088 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20117, 20141
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Hamlet
Acreage: *No Data*
Site Description:

2001: Along south side of T intersection of Unison and Bloomfield Roads.

April 2010: The resource has not undergone major changes since the last survey.

2001: Garage: Modern; extremely large, gable-end concrete block garage (NC).

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

2001: Historical Significance:
Although this late-19th-century building once housed the post office and Charles Osbourne's saddle shop it has been so greatly altered that it no longer has any historical architectural integrity. The building originally had 6/6-sash windows and board-and-batten siding as character-defining features. These have been removed and a large rear addition built. It does not contribute to the Unison Historic District.

April 2010: While this property contains historic resources, they post-date the period of significance of the Unison Battlefield Historic District (November 1-3, 1862) and are, therefore, considered non-contributing to the historic district. They do, however, contribute to the Unison Historic District [053-0692] that has a period of significance up to 1952.

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1880
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Commerce/Trade, Domestic, Government/Law/Political

Other ID Number: *No Data*
Architectural Style: Vernacular
Form: *No Data*
Number of Stories: 1.0
Condition: Remodeled
Threats to Resource: Major Alteration
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

2001: 21088 Unison Road; Uncle Tom's Cabin (53-692-12; 53-128): ca. 1880 with modern additions and alterations; 1-story, 3-bay, gable-end (asphalt shingle); frame (vinyl siding) vernacular dwelling that has been so highly altered it lacks all architectural integrity. Details include 1/1 vinyl windows, triangular attic vent; gable-roofed hood supported by brackets; and large rear cross-gable-roofed wing. This building once housed the post office and Osbourne's saddle shop (NC).

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Vinyl	1/1
Roof	Gable	Asphalt	Shingle
Foundation	Solid/Continuous	*No Data*	*No Data*
Structural System and Exterior Treatment	Frame	Wood	Siding, Vinyl

Secondary Resource Information

Secondary Resource #1

Resource Category: Domestic
Resource Type: Garage
Date of Construction: 1970Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Commerce/Trade, Domestic, Government/Law/Political
Architectural Style: Vernacular
Form: *No Data*
Condition: Good
Threats to Resource: Major Alteration
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

2001: Garage: Modern; extremely large, gable-end concrete block garage (NC).

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: 053-0692-0012
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 12/11/2001
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Windshield

Project Review File Number: 053-0128
Investigator: Fishburne, Jr, Junius R.
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 5/1/1971
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	Church, 21142 Unison Road
Current	Unison United Methodist Church
Historic/Current	Unison Methodist Church
Historic/Location	Bethesda Meeting House, 21142 Unison Road

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District.

Property Addresses

Current - 21142 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Additional Property Information

Architecture Setting: Hamlet
Acreage: *No Data*
Site Description:

2001: Bushes in front. Parking on side.

April 2010: The resource has not undergone major changes since the last survey.

1974: Many member of well-known early families are buried in the cemetery.

2001: Shed: Modern; shed-roofed, concrete block shed (NC).

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

1974: Organized about 1785 and believed to be one of the oldest Methodist Churches in Loudoun County, preceded by one in Leesburg. The original church building was about half a mile away from the present structure, and an early graveyard still remains there.

The present structure was supposedly built by Mr. William Benton, who built several other notable local buildings, including Oak Hill for President James Monroe.

2001: Historical Significance: Constructed ca. 1832 and replacing a late-18th-century Bethesda Meeting House, this church is a vernacular example of a transitional Federal to Greek Revival-style building. Although the original double entrance doors have been enclosed and replaced with a double-leaf central door, the building retains a fairly high degree of integrity. Thought to have been used as field hospital during the Civil War, some graffiti from the Civil War period was found on the walls in the gallery until it was painted over in the mid-20th century. The property is the only church in Unison and one of the oldest surviving Methodist churches in the county. It is a contributing resource to the Unison Historic District.

April 2010: The Unison Battlefield Historic District is significant under Criterion A, relating to the significant Battle of Unison that took place November 1-3, 1862. Along with its outbuildings, pristine setting, and architectural integrity, this property contributes to the overall historic district. The property was part of Phases 3 and 4 of the battle on November 2, 1862. This property also contributes to the Unison Historic District [053-0692].

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category:	Religion
Resource Type:	Church/Chapel
NR Resource Type:	Building
Historic District Status:	Contributing
Date of Construction:	Ca 1835
Date Source:	Site Visit/Written Data
Historic Time Period:	Antebellum Period (1830 - 1860)
Historic Context(s):	Religion
Other ID Number:	*No Data*
Architectural Style:	*No Data*
Form:	*No Data*
Number of Stories:	2.0
Condition:	Good
Threats to Resource:	None Known
Cultural Affiliations:	*No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

1974: Built in 1832 (church records), this is a good, two story, brick Methodist meeting house which still retains a great deal of its original fabric, in spite of some minor alterations over the years.

In 1952 a social hall and Sunday School classrooms were added to the rear and north of the Church building.

2001: 21142 Unison Road; Unison United Methodist Church (53-692-7; 53-129): ca. 1835 with ca. 1950 rear addition; 2-story, 3-bay, brick (Flemish-bond on front and 5-course American-bond on sides and rear), gable-end (standing-seam metal) church with central double-leaf doors on first-floor façade and 3 bays of 12/8-sash windows on the second-floor façade. It appears that the first floor originally had 2 doors flanking a central window, but these have been bricked in and replaced with the current central entry. Other details on this vernacular Greek Revival-style church include 12/12-sash windows on first floor; louvered wooden shutters, gable-end returns, lunette with starburst motif panel; and cupola with sawtooth wood shingle siding and open belfry. To the rear of the church, attached by a gable-roofed hyphen, is a 1-story ca. 1950 addition housing a social hall and Sunday school classrooms.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	Multiple-light
Roof	Gable	Metal	Standing Seam
Chimneys	None	*No Data*	*No Data*
Porch	None	*No Data*	*No Data*
Structural System and Exterior Treatment	Masonry	Brick	Bond, American
Foundation	Solid/Continuous	Brick	Bond, American

Secondary Resource Information

Secondary Resource #1

Resource Category:	DSS Legacy
Resource Type:	Shed
Date of Construction:	1960Ca
Date Source:	*No Data*
Historic Time Period:	The New Dominion (1946 - 1991)
Historic Context(s):	Religion
Architectural Style:	No Discernable Style
Form:	*No Data*
Condition:	N/A
Threats to Resource:	None Known
Cultural Affiliations:	*No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

2001: Shed: Modern; shed-roofed, concrete block shed (NC).

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 12/11/2001
Dhr Library Report Number: *No Data*

Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase II/Intensive

Project Review File Number:	053-0129
Investigator:	Lewis, John G.
Organization/Company:	Unknown (DSS)
Photographic Media:	*No Data*
Survey Date:	7/12/1974
Dhr Library Report Number:	*No Data*

Project Staff/Notes:

appeared to have been recorded as 053-0449 at the time of this survey

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21223-21229 Unison Road
Historic/Current	Bonnycastle
Historic/Location	John Keen House, 21223 Unison Road

Property Addresses

Current - 21223 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Hamlet
Acreage: 21
Site Description:

2001: Located at the NW edge of Unison, 21 acres, outbuildings located behind house.

April 2010: The resource has not undergone major changes since the last survey.

1982: Barn and outbuldings generally located north of the main house.

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

1982: Bonnycastle is a good example of a mid-19th-century Greek Revival plantation house, an uncommon architectural style and type in the county.

2001: Historical Significance:
Constructed ca. 1855, Bonnycastle is a fine example of a Greek Revival-style dwelling rendered in stone. Although the roof was recently raised from it original, almost flat, pitch, the house still retains a high degree of integrity. The property also includes a nice collection of farm-related outbuildings dating to the late 19th and early 20th centuries. Although located at the western edge of the Unison Historic District, the property contributes visually to the district.

April 2010: The Unison Battlefield Historic District is significant under Criterion A, relating to the significant Battle of Unison that took place November 1-3, 1862. Along with its outbuildings, pristine setting, and architectural integrity, this property contributes to the overall historic district. The property was part of Phases 3 and 4 of the battle on November 2, 1862. This property also contributes to the Unison Historic District [053-0692].

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Contributing
Date of Construction: Ca 1855
Date Source: Site Visit

Historic Time Period: Antebellum Period (1830 - 1860)
Historic Context(s): Architecture/Community Planning, Domestic, Subsistence/Agriculture
Other ID Number: *No Data*
Architectural Style: Greek Revival
Form: *No Data*
Number of Stories: 2.0
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Architecture Summary, 1982: It is a large, 2-story stone house with a pair of exterior end stone chimneys at each gable end. The house was originally plastered and scored to resemble finished stone blocks., see intensive survey for additional exterior and interior descriptions. Built in the 1850s and currently in good condition.

2001 HD: 21223 Unison Road; Bonnycastle (53-692-10; 53-126): ca. 1855; 2-story, 5-bay, stone (random rubble) Greek Revival-style dwelling with paired semi-exterior-end stone chimneys on each gable end of the house and a raised stone basement. The exterior walls were originally plastered and scored to resemble finished stone blocks and the roof was a very shallow-pitched gable. In the 1990s, the roof was raised slightly to a more standard pitch and reroofed in copper. The newly created gable ends, with lunette shaped vents, were clad in aluminum siding. The front of the house is dominated by a 2-story, full-height 3-bay portico with giant Tuscan columns, broad pilasters, and a modillioned cornice. A small balustrated balcony supported by consoles projects from the 2nd floor under the portico. The front door has a 7-light transom, 3-light sidelights, and paneled reveals. The windows are 9/9- and 6/6- double-hung sash with plain trim. The house was constructed around 1855 by John Keen.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Structural System and Exterior Treatment	Masonry	Stone	Random Rubble
Roof	Gable, Side	Metal	Standing Seam
Foundation	Solid/Continuous	Stone	Rubble, Random
Windows	Sash, Double-Hung	Wood	9/6
Porch	2-story, 3-bay	Wood	Columns, Tuscan
Chimneys	Exterior End	Stone	Rubble, Random

Secondary Resource Information

Secondary Resource #1

Resource Category: Agriculture/Subsistence
Resource Type: Silo
Date of Construction: 1910Ca
Date Source: *No Data*
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning, Domestic, Subsistence/Agriculture
Architectural Style: No Discernable Style
Form: *No Data*
Condition: N/A
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Silo: ca. 1910; terra-cotta tile silo with metal roof.

April 2010: The resource has not undergone major changes since the last survey.

Secondary Resource #2

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 1900Ca
Date Source: *No Data*
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning, Domestic, Subsistence/Agriculture
Architectural Style: No Discernable Style
Form: *No Data*
Condition: N/A
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Shed: early 20th century; 4-bay, gable-roofed shed of pole construction clad in vertical wood siding.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Secondary Resource #3

Resource Category: Domestic
Resource Type: Garage
Date of Construction: 1930Ca
Date Source: *No Data*
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Architecture/Community Planning, Domestic, Subsistence/Agriculture
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Garage: early to mid-20th century; 2-bay, gable-end (corrugated metal) garage with board-and-batten siding and rear and side shed-roofed wing s.
April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Secondary Resource #4

Resource Category: Domestic
Resource Type: Well/Well House
Date of Construction: 1980Ca
Date Source: *No Data*
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning, Domestic, Subsistence/Agriculture
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Well house: modern; 1-story, 1-bay, gable-roofed (wood shingle) stuccoed well house with batten door (NC).

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Secondary Resource #5

Resource Category: Domestic
Resource Type: Outbuilding,Domestic
Date of Construction: 1980Ca
Date Source: *No Data*
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning, Domestic, Subsistence/Agriculture
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Studio: 1970s; 1 ½-story frame studio with gable roof and shed-roofed dormer (NC)

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1.5

Secondary Resource #6

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: 1890Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning, Domestic, Subsistence/Agriculture
Architectural Style: No Discernable Style
Form: *No Data*
Condition: N/A
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

1982: Frame barn covered in vertical planks and having vented twin cupolas probably dates from the mid 19th century.
To the rear is a shed-roofed corncrib on a stone foundation.

2001: Barn: late 19th century; 2-story, frame (board-and-batten) bank barn on stone foundation with 2 hip-roofed cupolas with rectangular vents
.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 2

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Rehabilitation Tax Credit

DHR ID: 053-0126
Staff Name: DHR
Event Date: 12/1/2003
Staff Comment

No Data

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: 053-0692-0010
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 12/10/2001
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase II/Intensive

Project Review File Number: 053-0126
Investigator: Edwards, David
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 10/1/1982
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Windshield

Project Review File Number: 053-0126
Investigator: Fishburne, Jr., Junius R.
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 5/1/1971
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21111 Unison Road
Historic/Current	Henry Evans House
Historic/Location	Eleanor R. Johnstone House, 21111 Unison Road

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District.

Property Addresses

Current - 21111 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20141
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Additional Property Information

Architecture Setting: Hamlet
Acreage: *No Data*
Site Description:

2001: House sits off road, mature trees and bushes.

April 2010: The resource has not undergone major changes since the last survey.

1983: A late-19th century frame store was attached to the house, but was later destroyed.

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

1983: The house has had several 20th century owners.

2001: Historical significance:
This 2-story, 3-bay, Federal-style brick dwelling features a prominent brick mousetooth cornice. Constructed in the early 19th century, it is believed to have been constructed by Henry Evans, an early citizen of Unison. Although the exterior brick walls have been stuccoed, the house has good architectural integrity and is a contributing resource to the Unison Historic District.

April 2010: The Unison Battlefield Historic District is significant under Criterion A, relating to the significant Battle of Unison that took place November 1-3, 1862. Along with its outbuildings, pristine setting, and architectural integrity, this property contributes to the overall historic district. The property was part of Phases 3 and 4 of the battle on November 2, 1862. This property also contributes to the Unison Historic District [053-0692].

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Contributing
Date of Construction: Ca 1815
Date Source: Site Visit
Historic Time Period: Early National Period (1790 - 1829)

Historic Context(s): Architecture/Community Planning, Domestic
Other ID Number: *No Data*
Architectural Style: Federal/Adamesque
Form: *No Data*
Number of Stories: 2.0
Condition: Good
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

1983: The Johnstone House is a good example of a Federal brick dwelling in a small rural town. It is a two story structure with Flemish bond front and 5-course American bond sides and rear. A hound's tooth brick cornice extends across the front and rear and flared brick jack arches are over 6/6 double sash windows. The house has interior end chimneys. A 1-story rear shed addition is modern

Much of the interior of the house is still intact. A molded chair rail is in three rooms. Architrave trim frames windows and 6-panel and 4-panel doors. Floors are random width boards. Two remaining mantels feature double architrave trim around the fireplace openings and molded shelves. The house is in good condition and was built early in the 19th century.

2001: 21111 Unison Road; Henry Evans House (53-692-5; 53-105): ca. 1815; 2-story, 3-bay, brick (stucco), gable-roofed Federal-style dwelling with 6/6 windows, mousetooth cornice, and 2 interior-end chimneys. Details include modern vinyl shutters, asphalt shingle roofing, and 1-bay pedimented portico with modern square supports. To the rear is a 1-story shed-roofed modern wing. According to an architectural survey conducted in 1982 by David Edwards, this building was not covered in stucco at that time and had exposed Flemish bond on the front and 5-course American bond on the sides and rear, and flared brick jack arches. The survey form also says that a late-19th-century frame store was originally attached to the house but was later destroyed. According to deed research conducted as part of the 1982 survey, this lot was purchased by Henry Evans in 1815 from Samuel Dunkin. It is presumed that Evans constructed the house shortly after acquiring the property.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	9/6
Roof	Gable	Asphalt	Shingle
Foundation	Solid/Continuous	*No Data*	*No Data*
Chimneys	Interior End	Brick	Stuccoed
Structural System and Exterior Treatment	Masonry	Brick	Stuccoed
Porch	1-story, 1-bay	Wood	Post, Square

Secondary Resource Information

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*

Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: 053-0692-0005
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 12/11/2001
Dhr Library Report Number: *No Data*

Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase II/Intensive

Project Review File Number: 053-1052
Investigator: Edwards, David
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/1983
Dhr Library Report Number: *No Data*

Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 20985 Unison Road
Historic/Current	Elton

Property Addresses

Current - 20985 Unison Road Route 630

County/Independent City(s):	Loudoun (County)
Incorporated Town(s):	*No Data*
Zip Code(s):	*No Data*
Magisterial District(s):	*No Data*
Tax Parcel(s):	*No Data*
USGS Quad(s):	BLUEMONT

Property Evaluation Status

DHR Board: Eligible

This Property is associated with the Unison Historic District/Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Hamlet

Acreage: 22

Site Description:

2001: Located on the northeast edge of town. 22 acre tract.

April 2010: The resource has not undergone major changes since the last survey.

1983: Large frame barn, smaller frame garage, and metal grain silo are situated on the property.

April 2010: The resource has not undergone major changes since the last survey.

2001: Meat house: late 19th century; gable-end end (standing–seam metal), frame (stucco); split-level stone foundation with entry on rear; basement used to store dairy products.

April 2010: The resource has not undergone major changes since the last survey.

Corncrib: late-19th century, frame (vertical wood siding) gable-roofed (standing-seam metal) corncrib with open central bay.

April 2010: The resource has not undergone major changes since the last survey.

Barn: late 19th century; 2-story, frame (vertical siding), gable-roofed (standing-seam metal) barn on stone foundation with cross-gable-roofed side wing addition.

April 2010: The resource has not undergone major changes since the last survey.

Silo: ca. 1930; concrete silo with hemispherical metal top.

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

1983: According to the owner, the house was built around 1790 and known as a Rust family home. In 1932 it was acquired by Col. Samuel Marshal IV.

2002: Historical Significance:
The earliest portion of this brick house is the current rear wing. Constructed ca. 1802 and of brick construction, it originally fronted the road. The 2-story, 3-bay front section, also of brick with stucco, is believed to have been added by Theodoric Leith ca. 1845. The property includes a nice collection of farm-related outbuildings dating to the late 19th and early-20th centuries. The property has recently been carefully restored using the Virginia Rehabilitation Tax Credits. During that project, the property was determined to be individually eligible for the National Register of Historic Places. It is located at the southeastern edge of Unison and contributes to the Historic District.

April 2010: The Unison Battlefield Historic District is significant under Criterion A, relating to the significant Battle of Unison that took place November 1-3, 1862. Along with its outbuildings, pristine setting, and architectural integrity, this property contributes to the overall historic district. The property was part of Phases 3 and 4 of the battle on November 2, 1862. This property also contributes to the Unison Historic District [053-0692].

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: Legacy

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category:	Domestic
Resource Type:	Single Dwelling
NR Resource Type:	Building
Historic District Status:	Contributing
Date of Construction:	Ca 1802
Date Source:	Site Visit/Written Data
Historic Time Period:	Early National Period (1790 - 1829)
Historic Context(s):	Architecture/Landscape, Domestic, Subsistence/Agriculture
Other ID Number:	*No Data*
Architectural Style:	Federal/Adamesque
Form:	*No Data*
Number of Stories:	2.0
Condition:	Excellent
Interior Plan:	Hall-Parlor
Threats to Resource:	None Known
Cultural Affiliations:	*No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

Architecture Summary, 1983: The original rear ell has a molded brick cornice... built circa 1790.

2002: 20985 Unison Road; Elton (53-692-17; 53-134): ca. 1802, ca. 1845; Two-story brick and stucco dwelling with a stone foundation. The rear 2-story wing is the earliest ca. 1802 portion and contains an interior-end brick chimney and 6/6-sash windows. The current front, gable-roofed, 3-bay section is also of brick construction (stuccoed) and was added ca. 1845. The original section of the house was probably constructed ca. 1802 and the front section by Theodoric Leith ca. 1845.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Roof	Gable, Side	Metal	Standing Seam
Foundation	Solid/Continuous	Stone	Stucco
Windows	Sash, Double-Hung	Wood	6/6
Structural System and Exterior Treatment	Masonry	Brick	Stuccoed
Porch	1-story, 1-bay	*No Data*	*No Data*
Chimneys	Interior End	Brick	Stuccoed

Secondary Resource Information

Secondary Resource #1

Resource Category:	Agriculture/Subsistence
Resource Type:	Silo
Date of Construction:	1930Ca
Date Source:	Site Visit
Historic Time Period:	World War I to World War II (1917 - 1945)
Historic Context(s):	Architecture/Landscape, Domestic, Subsistence/Agriculture
Architectural Style:	No Discernable Style
Form:	*No Data*
Condition:	N/A

Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
2002: Silo: ca. 1930; concrete silo with hemispherical metal top.

April 2010: The resource has not undergone major changes since the last survey.

Secondary Resource #2

Resource Category: Agriculture/Subsistence
Resource Type: Corncrib
Date of Construction: 1890Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Landscape, Domestic, Subsistence/Agriculture
Architectural Style: No Discernable Style
Form: *No Data*
Condition: N/A
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
2002: Corncrib: late-19th century, frame (vertical wood siding) gable-roofed (standing-seam metal) corncrib with open central bay.

April 2010: The resource has not undergone major changes since the last survey.

Secondary Resource #3

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: 1890Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Landscape, Domestic, Subsistence/Agriculture
Architectural Style: No Discernable Style
Form: *No Data*
Condition: N/A
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
2002: Barn: late 19th century; 2-story, frame (vertical siding), gable-roofed (standing-seam metal) barn on stone foundation with cross-gable-roofed side wing addition.

April 2010: The resource has not undergone major changes since the last survey.
Number of Stories: 2

Secondary Resource #4

Resource Category: Agriculture/Subsistence
Resource Type: Smoke/Meat House
Date of Construction: 1890Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)

Historic Context(s): Architecture/Landscape, Domestic, Subsistence/Agriculture

Architectural Style: No Discernable Style

Form: *No Data*

Condition: N/A

Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

2002: Meat house: late 19th century; gable-end end (standing–seam metal), frame (stucco); split-level stone foundation with entry on rear; basement used to store dairy products.

April 2010: The resource has not undergone major changes since the last survey.

Corncrib: late-19th century, frame (vertical wood siding) gable-roofed (standing-seam metal) corncrib with open central bay.

April 2010: The resource has not undergone major changes since the last survey.

Barn: late 19th century; 2-story, frame (vertical siding), gable-roofed (standing-seam metal) barn on stone foundation with cross-gable-roofed side wing addition.

April 2010: The resource has not undergone major changes since the last survey.

Silo: ca. 1930; concrete silo with hemispherical metal top.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District

Local Historic District Name: *No Data*

Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction

Phase II Intensive Survey Integrity Recommendations: Design, Location, Materials, Setting, Workmanship

Event Type: Grant: Federal

Project Review File Number: *No Data*

Investigator: Unison Preservation Society

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction

Phase II Intensive Survey Integrity Recommendations: Design, Location, Materials, Setting, Workmanship

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: 053-0629-0017

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 12/11/2001

Dhr Library Report Number: *No Data*

Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction

Phase II Intensive Survey Integrity Recommendations: Design, Location, Materials, Setting, Workmanship

Event Type: Rehabilitation Tax Credit

DHR ID: 053-0134

Staff Name: DHR

Event Date: 12/18/2000

Staff Comment

No Data

Event Type: DHR Board: Eligible

DHR ID: 053-0134

Staff Name: State Review Board

Event Date: 12/6/2000

Staff Comment

No Data

Event Type: DHR Staff: Eligible

DHR ID: 053-0134

Staff Name: DHR

Event Date: 9/28/2000

Staff Comment

No Data

Event Type: PIF

Project Review File Number: 053-0134
Investigator: Kalbian, Maral S.
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 9/7/2000
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction
Phase II Intensive Survey Integrity Recommendations: Design, Location, Materials, Setting, Workmanship

Event Type: Survey:Phase II/Intensive

Project Review File Number: 053-0134
Investigator: Edwards, David
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/1983
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction
Phase II Intensive Survey Integrity Recommendations: Design, Location, Materials, Setting, Workmanship

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Historic/Current	Unison Historic District

Property Addresses

Current - Bloomfield Road
Alternate - Route 630
Current - Unison Road

Property Evaluation Status

NRHP Listing
VLR Listing

This Property is associated with the Unison Historic District.

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20017
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Additional Property Information

Architecture Setting: Hamlet
Acreage: 70
Site Description:

No Data

Surveyor Assessment:

1982: The Unison community has an interesting history and many well-preserved historic buildings.

2001: Unison is a village located in a rural area of southwest Loudoun County. Originally laid out in 1802, the community was officially established by the General Assembly in 1813. Like many small rural villages in Virginia, Unison served the local and surrounding agricultural area as a meeting, shopping, worshipping, education, and residential center. The primary building type however, has always been the dwelling. The town flourished in the second quarter of the nineteenth century and might have developed into a significant commercial hub had not the Civil War and its devastating economic impact arrested prosperity as it did many towns in the region. Its location at a rural crossroads, miles from major highways and railroad lines, served to stunt Unison's growth, but this same geographical location has preserved much of its mid-nineteenth-century character. Thirty years after the Civil War, Unison began a recovery that never quite achieved its earlier peak. After the turn of the century, the shift away from an agricultural economy to one based on more urban industrialization saw a steady decrease in the local population. Since the 1950s, Unison has served primarily as a residential center, although the United Methodist Church there is still active. It is one of the best-preserved rural villages in all of Loudoun County and has maintained much of its mid-nineteenth-century ambiance as a small rural crossroads. The Unison Historic District is eligible for inclusion on the National Register of Historic Places under Criterion C because of its varied collection of early- to late-nineteenth-century buildings. The locally significant district possesses a high degree of integrity and its interesting history as a rural crossroads in southwestern Loudoun County further enhances its significance.

See nomination for historical details.
Even after WWII, large farms in the area employed people in and around Unison, but gradually many people used farming as a supplement to a job outside the community. The village identity and cohesion continued to be centered in activities at the Methodist Church, the store, and on the baseball diamond, where Unison's young men challenged other Loudoun County teams; the playing field is still located northwest of the Bloomfield-Unison road junction.

By the 1950s, Unison was still a quiet rural crossroads village and agriculture was still an important economic factor for the surrounding area, but larger farms and mechanized utilities meant fewer jobs for farm laborers. More and more of Unison's citizenry would find employment in non-agricultural pursuits, and the notion of commuting to jobs in Northern Virginia or Washington DC became not only feasible, but lucrative. Since then the village's quaint charm and pastoral setting has attracted artists and writers.

Surveyor Recommendation: Legacy

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Other
Resource Type: Historic District

NR Resource Type:	District
Historic District Status:	Contributing
Date of Construction:	Ca 1802
Date Source:	Site Visit/Written Data
Historic Time Period:	Early National Period (1790 - 1829)
Historic Context(s):	Architecture/Community Planning, Commerce/Trade, Domestic, Military/Defense, Religion
Other ID Number:	*No Data*
Architectural Style:	*No Data*
Form:	*No Data*
Number of Stories:	*No Data*
Condition:	Good
Threats to Resource:	Development
Cultural Affiliations:	*No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

Architecture Summary, 1982: Among the historic homes in Unison are the H. W. Saffel house, in the carpenter's Gothic style, the former Keene residence, built just before the Civil War, which has a flat roof, and the Miley residence which was built circa 1890. One of Unison's older houses, at one time the residence of Charlie Osborne, maker of saddles and Unison's postmaster.

Unison Methodist Church was founded in 1832. It is brick with a metal gable roof, and served as a hospital during the War between the States.

2001: Although there was settlement and religious activity in the area during the eighteenth century, it was not until after 1802 that most of the buildings in Unison were constructed. The architectural and documentary evidence suggests that the earliest resources in the district appear to date to the early nineteenth century, although some buildings may have original cores that could date to the late eighteenth century. Not officially established by the General Assembly until 1813, the village contained a portion that had been surveyed out into ten ½-acre lots a year earlier. The period of greatest development in the village occurred shortly after its establishment and continued until the Civil War. During that time, houses were built along with commercial, religious, and transportation-related resources.

For the period of its greatest activity, Unison served the surrounding rural area as a commercial, religious, and social center. While its location miles away from major highways and railroad lines curbed its growth during the latter half of the nineteenth century, these same influences later helped to preserve it.

The 44 contributing resources in the district are made up primarily of residences and their associated domestic and farm-related outbuildings. Some of the other contributing resources include a church, former school, store, and saddle-maker's shop. Archaeological resources are not included in this nomination. The 13 noncontributing elements in the district are primarily outbuildings.

ARCHITECTURAL ANALYSIS

Unison is a small rural community that lies approximately midway between US Routes 7 and 50 in southwest Loudoun County, Virginia. It was originally part of Thomas Lord Fairfax's Northern Neck Proprietary until 1741 when Major Richard Blackburn was issued a grant by Fairfax for 2,628 acres. It does not appear that Blackburn ever lived on the property and he may have rented portions of it to Quakers, who lived on surrounding tracts. Quakers in fact established the South Fork Meeting House and surrounding cemetery in 1746 on land that had been part of Blackburn's original grant. This 10-acre tract is outside the Unison Historic District boundaries and is located about one mile to the southwest.

After Blackburn's death the land passed to his son Thomas, who in turn gave parcels to each of his two daughters and in 1785 sold 2,328 acres to Spence Grayson. The land on which Unison is located was part of the parcel Thomas Blackburn deeded to his daughter Sarah and her husband Nathaniel Crawford. In 1802, Sarah and Nathaniel Crawford sold 120 acres to William Galliher (also spelled Galleher, Galligher). Ten years later, Galliher subdivided 5 acres of that purchase into ten ½-acre lots which he devised to his children and grandchildren. He described the gifts as being "in the Town or at the place called Greenville." These 5 acres comprised the core of what would become Union the following year by an Act of the General Assembly. That act added 15 acres to Galliher's original "Greenville" and called for the laying out of "twenty acres of land, at the village called and known by the name of Union." Lots and streets were to be laid out and minimum building requirements included a "dwelling house theron equal to twelve feet square with a brick or stone chimney."

The architectural resources in the Unison Historic District illustrate the story of the community's development. According to architectural evidence, six properties date to the first three decades of the nineteenth century, and five from the 1830-1865 period. Five resources survive from the late nineteenth and early twentieth centuries, including a school and store. One dwelling in the district dates from the World War I to 1952 period and two modern dwellings were constructed after 1952.

The majority of the resources are of the vernacular tradition, yet there are also some examples of buildings exhibiting elements of the Federal and Greek Revival styles. Log, brick, stone and frame are the most common construction materials and are sometimes used in combination with each other. A distinctive element of many of the earliest historic buildings in Unison is that they feature two front entrances, suggesting that part of the structure was used as a dwelling and part for commercial purposes.

Although several of the buildings in the district are generally believed to have been constructed while the land was still in the possession of Sarah and Nathaniel Crawford, court records indicate that when they sold the property in 1802, they were living in Prince Georges County, Maryland. In all probability, the earliest buildings in the district were constructed at or around the time of Galliher's 1802 purchase of the land.

When William Galliher distributed half-acre lots to his children in 1812, he referred to the land as being "in the town of Greenville." The plat showing the location of each of the lots has not been discovered but deed descriptions suggest that at least the east end of current Unison was within the area he gifted. Two of the earliest dwellings in Unison, Butterland and Elton, are located at the east end of the village and are probably the earliest of the Galliher homes.

Butterland (Photo 1) is a two-story stone dwelling that was constructed in at least three phases, the earliest of which is the large two-story, three-bay central portion with a semi-exterior-end chimney on one end and an interior-end chimney on the other. Although the original central door has been enclosed into a window and the interior partition wall removed, it appears that this section of the house dates to the early nineteenth century. In all probability it was the home of William Galliher's son William Jr. The side, two-bay, two-story wing with exterior-end stone chimney was added shortly after and currently features a one-bay pedimented portico and stucco scored to look like ashlar. When this section was built, the house would have had two front doors, perhaps indicating another use for the side wing.

Butterland sits right off the road and during the late nineteenth century was the home of Dr. Hoge, a well-known local physician. Historic photographs show that his office once sat right along the road (Photo 2). It was moved to its current location in the southeast rear yard in the twentieth century. The historic photo also shows later additions made to the rear wing of the house.

Elton is located on the northeast end of town and sits on a larger tract than Butterland (Photo 3). The rear portion of the brick with stucco house is the oldest and has a side-passage–plan with the front facing Unison Road. The architectural evidence, composed of fine Federal-style interior woodwork, suggests a construction date of ca. 1802. The front section, also of brick, was added around 1845 by Theodoric Leith, and oriented the house at a right angle to the road. Leith was a physician and also served as Unison postmaster from 1835 to 1844. The 1853 Yardley Taylor map of Loudoun County, designates "T. Leith" as being the owner/occupant of Elton. Leith also owned and purchased adjacent lands, thereby increasing the property's acreage.

Another early dwelling is the Thornton Walker House, located across Unison Road from Butterland (Photo 4). Walker, once a postmaster of Unison, purchased the lot in 1814 from Caleb Galliher, who had received it from his father two years earlier. In the deed from William to Caleb, the property is described as ½ an acre and was designated as lot 7. Thornton Walker probably built the house shortly after he purchased it in 1814. Loudoun County tax records of 1820 show that Walker's house was appraised at $1,400, one of the most valuable properties in the village. The house consists of four distinct units: a two-story brick section, a two-story log section, a one-story frame wing, and a rear 1½-story log wing. The rear and front log portions are the oldest parts of the house. The brick section, laid in 5-course American bond, was built onto the west end of the front log section in the mid-nineteenth century. The house is another example of a dwelling in Unison that originally had two front entrances: one in the log section and one in the brick section. Since Thornton Walker was the village's postmaster, it seems quite likely that he devoted a portion of his house to a post office.

A concentration of buildings from the early nineteenth century, including a church and four dwellings, also exists toward the west end of the village. The oldest of these appears to be the Mary Phillips House, a 1 ½-story stone (stucco) building with later additions (Photo 5). The house originally had an exterior-end stone chimney that was later replaced with the current semi-exterior-end brick one. The original three-room plan was changed to a hall parlor plan when an interior partition was removed. The woodwork, including double-architrave trim framing six-panel doors and chair rail with a pattern of alternating reeding and X motifs, is fairly sophisticated for such a small and unpretentious dwelling (Photo 6).

The small frame building next to the house is generally believed to have once been a blacksmith's shop (Photo 7). This is well supported by the fact that Henry Saffel owned the property in 1894 and was listed in a state gazetteer as a coach and wagon builder.

The Henry Evans House, located along Unison Road west of the Mary Phillips House, is a fine example of a Federal-style brick dwelling (Photo 8). Although the three-bay, two-story building is now covered in stucco, the brick mousetooth cornice is still highly visible. According to a 1982 Virginia Historic Landmarks Commission Survey Form completed before the house was covered, the walls were laid in Flemish-bond brick on the front and 5-course American bond on the sides. It is believed that Henry Evans constructed this house shortly after he acquired the lot from Samuel Dunkin in 1815.

A ca. 1900 photograph of the house shows it once had a late-nineteenth-century, two-story frame store attached to its east end (Photo 9). This was one of two stores operating in Unison during the last decades of the nineteenth century and was owned and operated by Thomas A. Baker.

Glatton Folly is located at the northwest corner of the junction of Unison and Bloomfield Roads (Photo 10). The ca. 1820, two-and-one-half-story, frame dwelling features two exterior-end brick chimneys on the west end, and a full-height two-story portico on the east gable end. This portico, with a barrel vault and gable-end returns, is supported by rectangular tapered supports on paneled plinths and shelters a second-story balcony that is supported by brackets with pendants. Doors on each level lead out to either the balcony or the first-floor deck of the portico. It appears that this house was remodeled (new siding, windows, porches) sometime in the late nineteenth century to reflect more Victorian-era designs. Because of its location, it is one of the most visually prominent buildings in town. During the early twentieth century, it was the home of H. W. Saffel, who ran the Unison Store next door.

The Langcor House, located west of Glatton Folly, is composed of a two-story, five-bay frame dwelling with two front entrances and a diminutive side two-story exposed log wing (Photo 11). It is uncertain which section is earlier, but it appears that the two parts of the house were constructed fairly close in date to each other during the first half of the nineteenth century. Perhaps the exposed log section was used for non-residential purposes. The same year that Charles Osbourne purchased the property at public auction in 1904, he was named postmaster of Unison. Osbourne, a saddler, may have been enticed by the newspaper advertisement that offered the lot of about 3/4 of an acre and "a good Frame House containing eleven rooms with garret and cellar, good frame stable and carriage house, hen house, a filtered cemented cistern and other outbuildings. There are also a lot of fruit trees on the premises in good bearing condition."

In 1829 the village name was officially changed from Union to Unison. Despite this action by the postal service, the village continued to be called Union well into the twentieth century. Around 1832, the Old Bethesda Meeting House, a log Methodist church reputedly constructed in 1786, was superceded by a much larger brick structure now called Unison United Methodist Church (Photo 12). The two-story, three-bay building has brick walls laid in Flemish bond on the front and 5-course American bond on the sides and rear and is the only church in Unison. The vernacular Greek Revival-style church features a gable-end orientation with central double-leaf doors on the first-floor façade and three bays of 12/8-sash windows on the second floor. The façade originally had two front doors flanking a central window, but these have been enclosed.

This locally prominent building is believed to have served as a hospital during the Civil War. Before the interior was repainted in 1953, inscriptions scratched into the walls by Federal soldiers were visible. To the rear of the church, attached by a gable-roofed hyphen, is a one-story ca. 1950 addition housing a social hall and Sunday school classrooms.

In Joseph Martin's 1835 New and Comprehensive Gazetteer of Virginia description of "Union," the village contained twenty-five dwellings, three churches, one school, two stores, and one tavern. Only eight structures that were part of his description survive in the district. Martin's sketch captured Unison during its peak of greatest activity, as it served the surrounding rural area as a commercial, religious, and social center. It continued to be a locally important focal point until the Civil War period. When Unison was depicted on Yardley Taylor's 1853 map of Loudoun County, it was shown as a dog leg crossroads, with thirteen structures including the Methodist Meeting House. Taylor's map also

shows other similar rural communities including Bloomfield, also on a dog leg, and Philomont.

Four dwellings in the district date from the mid-nineteenth-century period. The Mildred Shackelford House, located along Unison Road next to Butterland, is a two-story, six-bay, Federal-style brick dwelling composed of two three-bay sections each with its own central door flanked by a window (Photo 13). The brick is laid in 5-course American bond and an obvious seam between the sections indicates two distinct construction periods. It appears that the left section may have been built a few years earlier than the one on the right. One of four buildings in the district with two front entrances, the house may have had a partial commercial use.

Although located on the far west end of the village and rural in nature, Bonnycastle visually delineates the westernmost boundaries of Unison and the historic district (Photo 14). The two-story, five-bay, random-rubble stone, Greek Revival-style dwelling features paired semi-exterior-end stone chimneys on each gable end and a raised stone basement. The house, constructed by John Keene, was originally plastered on the exterior and scored to resemble finished stone blocks. The house also originally had a very shallow-pitched gable roof, typical of the Greek Revival style, which was raised in the 1990s to a more standard pitch. The front of the house is dominated by a two-story, full-height, three-bay portico with giant Tuscan columns, broad pilasters, and a modillioned cornice. A small balustrated balcony supported by consoles projects from the second floor under the portico.

The Loudoun County Land Tax records indicate the house was completed in 1855, as it was first assessed the following year for a value of $4,000. The house appears on the 1853 Yardley Taylor Map and is identified as belonging to “J. Keene,” perhaps indicating it was under construction at that time.

The property also features a nice collection of late-nineteenth-century and early-twentieth-century farm outbuildings including a board-and-batten bank barn on a stone foundation, a shed-roofed corncrib, a ca. 1910 terra-cotta tile silo with metal roof, and two early-twentieth-century frame sheds (Photo 15).

The two other resources from this period are dwellings in which their original cores have been enlarged during the later nineteenth century to create I-houses (2-story, single-pile, center-passage plan). In the case of the Ballenger House, the main block is a two-story, frame, ca. 1880 I-house that features 2/2-sash windows, a three-bay porch with square posts and sawn brackets, and a central-front gable decorated with a sawn vergeboard and diamond-shaped attic vent window (Photo 16). To the side is a two-story frame wing with an interior-end brick chimney and to its rear is a diminutive one-and-one-half-story stuccoed wing that may be of masonry construction. It is this rear wing that appears to be the original mid-nineteenth-century section.

The property, which is identified on the 1853 Yardley Taylor Map as belonging to “H. Plaster,” marks the southeast boundary of the district and contains an almost complete collection of late-nineteenth- and early-twentieth-century outbuildings. The most interesting is the meat house in which the first floor is of stone construction and the second floor is frame clad in board-and-batten (Photo 17). Other outbuildings include a garage, corncrib, chicken coop, and fine bank barn and terra-cotta silo (Photo 18). These are similar to the ones found at Bonnycastle and may have been constructed by the same builder.

One other dwelling located on the western end of town is also an example of an older house that was later converted into an I-house. From the front, the house appears to be a fairly typical example of a late-nineteenth-century I-house with Folk Victorian detailing. But in fact it appears to be an earlier house that was added onto to achieve its current appearance, as is evidenced by the large exterior-end stone chimney on the west gable end (Photo 19).

The Civil War did not bring much devastation to the built environment of Unison, as there are no documented accounts of mass destruction. Instead, the impact was economic, as it was throughout the region. It was not until the late 1870s and early 1880s that economic stability returned to the area and allowed for new construction. Unison did experience a resurgence of sorts during the late nineteenth century, as a public school was built as well as several stores. However, it never again reached the local significance it enjoyed earlier in the century.

The Unison Historic District contains five resources from the Reconstruction to World War I era. These include a school, store, saddler’s shop, and three dwellings. Also during this period, several of the older buildings in the village were updated or enlarged to reflect more popular Victorian architectural styles.

Martin’s 1835 New and Comprehensive Gazetteer of Virginia indicated that at that time Unison had one “common” school, although its exact location is unknown. After the adoption of the Underwood Constitution of 1870 which mandated public education in Virginia, Unison built its first public school. According to deeds, it was originally located on the southwest corner of the Methodist Episcopal Church South lot. The current building in that general location is the old Unison School (Photo 20). Architecturally, the front portion appears to date to the 1890 period, although the rear section could be the 1870 portion. The building has undergone quite a bit of modern renovation and features 1/1-sash windows, a formed and parged concrete foundation, overhanging eaves, a plain frieze board, and an enclosed three-bay hip-roofed front porch. The school closed around 1915 and was then converted into a dwelling.

Prominently located at the junction of Unison and Bloomfield Roads, the Unison Store is the only surviving late-nineteenth-century store in the district and is a fine example of commercial architecture from that era (Photo 21). Constructed ca. 1880 by Lycergus E. Hutchison, the two-story, three-bay, gable-end frame store rests on a stone foundation. To the side is a one-bay, two-story frame addition with parapet. A four-bay porch with square posts and sawn brackets extends across the front of the entire store uniting the two sections. The building, which operated as a country store until the mid-1990s, is currently vacant and awaiting rehabilitation. The store gained local notoriety when it was the site of a 1937 robbery/murder of its 83-year-old owner, Henry Saffel.

The late-nineteenth-century building across the road from the store, locally known as Uncle Tom’s Cabin, once housed the post office and Charles Osbourne’s saddle shop. The one-story building has been so highly altered it lacks all architectural integrity and is considered a noncontributing element to the district.

Log was still being used as a construction material even after the Civil War. This is illustrated in the small one-and-one-half-story dwelling at 21070 Unison Road (Photo 22). Although the building has been stuccoed and added to considerably, it retains a fair amount of architectural integrity.

By the turn of the century, Unison was once again a thriving rural crossroads. According to the 1893-94 Chataigne’s Virginia Gazetteer, Unison had three stores, two hotels, two saddlers and harnessmakers, one physician, one wagon builder, one carpenter/builder, one saw mill, and one manufacturer of agricultural implements. By 1908, the population had dropped to 100 persons compared to its zenith of 135 during the mid-nineteenth century.

The decline in population and economic activity that began at the turn of the century is reflected in the lack of new construction from that era.

The two-story, frame I-house located next to Unison Store appears to have been constructed around 1910. The district's only building on Bloomfield Road, the Bishop House, was constructed in 1929 and reflects elements of the Craftsman style (Photo 23). The one-story, three-bay, gable-end, stuccoed frame bungalow has exposed rafter ends and overhanging eaves and features a stone and frame garage.

A January 4, 1955, photograph of Unison shows how little the community has changed since that time (Photo 24). The majority of buildings shown in the view of Unison Road, taken from the side yard of Butterland looking west, still survive. Remnants of what appear to be a wooden sidewalk along the south side of the road have since been removed.

The historic resources that make up the Unison Historic District illustrate the growth and development of the community from the early nineteenth century to modern times. Of the 57 resources in the district, 44 are contributing. The non-contributing elements are mainly outbuildings and a few modern dwellings that do not detract from the historical character of the district.

Secondary Resource Information

Historic District Information

Historic District Name: Unison Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: NRHP Listing

DHR ID: 053-0692
Staff Name: NPS
Event Date: 5/22/2003
Staff Comment
No Data

Event Type: VLR Listing

DHR ID: 053-0692
Staff Name: DHR
Event Date: 12/4/2002
Staff Comment
No Data

Event Type: NRHP Nomination

DHR ID: 053-0692
Staff Name: Maral S. Kalbian, Leila O.W. Boyer
Event Date: 7/20/2002
Staff Comment
No Data

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Edwards, David
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 10/1/1982
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21103 Unison Road
Historic	Mary A. Phillips House
Historic/Location	John Gardiner House, 21103 Unison Road

Property Addresses

Current - 21103 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20141
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Hamlet
Acreage: *No Data*
Site Description:

2001: Deep lot; mature trees and bushes.

April 2010: The resource has not undergone major changes since the last survey.

1983: Blacksmith shop is photographed.

2001: Blacksmith Shop: late-19th-century; 1-story, frame (board and batten), gable-roofed (standing-seam metal) blacksmith shop with interior-end brick flue, attached to rear chicken coop, and modern (ca. 1990) rear wing. The building has been converted into an artist's studio used to make tile.

Shed: early-20th- century; 1-story, shed-roofed (v-crimp metal) shed with board-and-batten siding. This building was moved here in the 1980s.

Studio: ca. 1975; 1-story, 3-bay studio with standing-seam metal roof, vertical wood siding and 6-light windows (NC).

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

1983: There have been several 20th century owners of this property. Currently owned by John Gardiner. See survey for list of known owners.

2001: Historical significance:
One of the few stone structures in the district, this stuccoed house is also one of the earliest (ca. 1810). It features fairly sophisticated Federal-style interior trim. The property also includes several outbuildings including one that is currently used as an artist's studio but is believed to have been a blacksmith's shop. The property is a contributing resource to the Unison Historic District.

April 2010: The Unison Battlefield Historic District is significant under Criterion A, relating to the significant Battle of Unison that took place November 1-3, 1862. Along with its outbuildings, pristine setting, and architectural integrity, this property contributes to the overall historic district. The property was part of Phases 3 and 4 of the battle on November 2, 1862. This property also contributes to the Unison Historic District [053-0692].

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category:	Domestic
Resource Type:	Single Dwelling
NR Resource Type:	Building
Historic District Status:	Contributing
Date of Construction:	Ca 1810
Date Source:	Site Visit
Historic Time Period:	Early National Period (1790 - 1829)
Historic Context(s):	Architecture/Community Planning, Commerce/Trade, Domestic
Other ID Number:	*No Data*
Architectural Style:	Vernacular
Form:	*No Data*
Number of Stories:	0.0
Condition:	Fair
Threats to Resource:	None Known
Cultural Affiliations:	*No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

1983: Built in the early 19th century, and currently in fair condition. The Gardiner House is a simple 1-1/2-story stone and stucco dwelling originally with an exterior end chimney which was later replaced by a brick flue. A single-bay front portico shelters the central front 6-panel door. Windows are 6/6 double sash with pegged frames. Front dormers are 20th century additions. A rear brick shed addition probably dates from the mid-19th century and a two-story stucco rear addition is modern. A rear exterior end stone chimney is also modern.

Originally a three room plan, a partition was removed, creating a two room plan. The interior woodwork is surprisingly sophisticated for a small unpretentious dwelling. Double architrave trim frames 6-panel doors with iron thumb latches and a decoratively carved chair rail featuring reeded segments and X designs surrounds the main room. No mantels remain.

2001: 21103 Unison Road; Mary Phillips House (53-692-4; 53-1051): ca. 1810 with later additions; 1 ½-story, stone (stuccoed), gable-roofed (standing-seam metal) dwelling with 2 front gable-roofed dormers. The house originally had an exterior-end stone chimney that was later replaced with the current semi-exterior-end brick one. Details include 6/6 windows, a 1-bay pedimented portico with square posts and a 2-rail balustrade, and a 6-panel front door. The house was originally a 3-room plan but an interior partition was removed creating a hall-parlor plan. The woodwork, including double-architrave trim framing 6-panel doors and chair rail with a pattern of alternating reeding and X motifs, is fairly sophisticated for such a small and unpretentious dwelling. A shed-roofed rear brick wing (stuccoed) appears to date to the mid-19th century, while the exterior-end stone chimney on its west side is modern. The large 2-story rear wing with semi-exterior-end chimney is also a modern addition.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	6/6
Roof	Gable, Side	Metal	Standing Seam
Structural System and Exterior Treatment	Masonry	Stone	*No Data*
Chimneys	Exterior End	Brick	Stuccoed
Foundation	Solid/Continuous	Stone	Rubble, Random
Porch	1-story, 1-bay	Wood	Post, Square

Secondary Resource Information

Secondary Resource #1

Resource Category:	Commerce/Trade
Resource Type:	Blacksmith Shop
Date of Construction:	1890Ca
Date Source:	Site Visit
Historic Time Period:	Reconstruction and Growth (1866 - 1916)
Historic Context(s):	Architecture/Community Planning, Commerce/Trade, Domestic
Architectural Style:	Vernacular
Form:	*No Data*
Condition:	Fair

Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

2001: Blacksmith Shop: late-19th-century; 1-story, frame (board and batten), gable-roofed (standing-seam metal) blacksmith shop with interior-end brick flue, attached to rear chicken coop, and modern (ca. 1990) rear wing. The building has been converted into an artist's studio used to make tile.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Secondary Resource #2

Resource Category: DSS Legacy

Resource Type: Shed

Date of Construction: 1920Ca

Date Source: Site Visit

Historic Time Period: World War I to World War II (1917 - 1945)

Historic Context(s): Architecture/Community Planning, Commerce/Trade, Domestic

Architectural Style: Vernacular

Form: *No Data*

Condition: Fair

Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

Shed: early-20th- century; 1-story, shed-roofed (v-crimp metal) shed with board-and-batten siding. This building was moved here in the 1980s.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Secondary Resource #3

Resource Category: DSS Legacy

Resource Type: Shed

Date of Construction: 1975Ca

Date Source: Site Visit

Historic Time Period: The New Dominion (1946 - 1991)

Historic Context(s): Architecture/Community Planning, Commerce/Trade, Domestic

Architectural Style: Vernacular

Form: *No Data*

Condition: Fair

Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

Studio: ca. 1975; 1-story, 3-bay studio with standing-seam metal roof, vertical wood siding and 6-light windows (NC).

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District

Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society, Maral Kalbian
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: 053-0692-0004
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 11/11/2001
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase II/Intensive

Project Review File Number: 053-1051
Investigator: Edwards, David
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/1983
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21124 Unison Road
Current	8 Oaks

Property Addresses

Current - 21124 Unison Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located off the south side of Unison Road the house is sited at a level grade to the road with a deep setback. A multi-branched, circular gravel driveway leads from the road to an attached garage, the front of the house, the barn, and the stable. A three-board fence encloses the property's agricultural fields. Mature trees and shrubs landscape the yard around the house.

March 2010: A barn and a silo are located west of the house. A stable rests north of the barn and a shed is placed west of the stable.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1975
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Ranch
Form: *No Data*
Number of Stories: 1.0
Condition: Good

Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Constructed ca. 1975, this one-story, seven-bay, brick, Ranch-style dwelling rests on a brick foundation. The house features a gable-on-hip roof clad in asphalt shingles, 8/8-sash double-hung vinyl windows, and a central-interior brick chimney. A three-bay, pedimented portico extends off the front of the house.

Secondary Resource Information

Secondary Resource #1

Resource Category: Agriculture/Subsistence
Resource Type: Stable
Date of Construction: 1975Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Stable: Constructed ca. 1975, this nine-bay, gable-roofed stable has a concrete block first floor and a frame second floor clad in board-and-batten siding. The roof is covered in standing-seam metal and a shed-roofed, one-story wing extends off the west side of the structure.
Number of Stories: *No Data*

Secondary Resource #2

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 1975Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Shed: This ca. 1975 shed has a gable roof clad in standing-seam-metal and board-and-batten siding.
Number of Stories: *No Data*

Secondary Resource #3

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: 1975Ca

Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Barn and Silo: Constructed ca. 1975, the concrete stave silo is attached to the barn by a gable-roofed hyphen. The barn has a gable roof clad in standing-seam metal and board-and-batten siding.

Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 20980 Unison Road
Historic	Ballenger House

Property Addresses

Current - 20980 Unison Road Route 630

County/Independent City(s):	Loudoun (County)
Incorporated Town(s):	*No Data*
Zip Code(s):	20117
Magisterial District(s):	*No Data*
Tax Parcel(s):	*No Data*
USGS Quad(s):	BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District; Unison Historic District.

Additional Property Information

Architecture Setting: Hamlet

Acreage: *No Data*

Site Description:

Located at the southeast end of Unison; farm outbuildings located behind house.

August 2006: The Ballenger House and associated outbuildings are located at the intersection of Foxcroft and Unison roads in the hamlet of Unison in rural, southeastern Loudoun County, Virginia. The general vicinity is marked by rolling pastureland, farms, and the Blue Ridge Mountains to the north and west. The dwelling sits within a manicured lawn, but there is no shrubbery or gardens around the house. Immediately to the rear and south of the house within the lawn ia a meat/smokehouse. The other ourbuildings are clustered to the south and east of the house and are organized around a gravel drive, which features two circular drives. Along Unison Road is a small apple orchard to the east of the house and circular drives. The remaining landscape is fenced, pastureland.

April 2010: The resource has not undergone major changes since the last survey.

Meat house: ca. 1880; 2-story, 1-bay, gable-end (corrugated metal) meat house where first floor is of stone construction and 2nd floor is frame clad in board-and-batten.

April 2010: The resource has not undergone major changes since the last survey.

Garage: ca. 1920; 1-bay, gable-end (corrugated metal), frame (vertical wood siding) garage with 5-bay, shed-roofed machine shed rear wing. Off of that is a gable-roofed stable with vertical wood siding.

April 2010: The resource has not undergone major changes since the last survey.

Corncrib: ca. 1920; central-aisle corncrib on concrete block piers with vertical wood slat siding, gable roof of standing-seam metal and side lean-to.

April 2010: The resource has not undergone major changes since the last survey.

Barn: mid-to late 19th century; 2 ½-story, heavy-timber frame (hand-hewn) bank barn on stone foundation with vertical wood siding and standing-seam metal gable roof, and side wing,

April 2010: The resource has not undergone major changes since the last survey.

Silo: ca. 1910 terra cotta silo with standing-seam metal roof.

April 2010: The resource has not undergone major changes since the last survey.

Chicken coop: ca. 1910, 2-bay, shed-roofed with vertical wood siding.

April 2010: The resource has not undergone major changes since the last survey.

Shed: modern; 2-bay turnout shed of pole construction (NC).

April 2010: The resource has not undergone major changes since the last survey.

August 2006: Secondary resources include a ca. 1880 meat/smoke house, ca. 1920 garage with shed and barn additions, ca. 1920 center-aisle corn crib, mid-late nineteenth-century bank barn with wing addition, ca. 1910 silo, ruins of a ca. 1910 chicken coop, and a non-contibuting modern shed.

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

2006: The earliest portion of this vernacular I-house may be in the rear/side and date to the mid-19th century. The main block is a late-19th-century I-house with nice detailing. The property includes a nice collection of farm-related outbuildings dating to the late 19th and early 20th centuries. The property is located at the southeastern edge of Unison and contributes to the Historic District.

April 2010: The Unison Battlefield Historic District is significant under Criterion A, relating to the significant Battle of Unison that took place November 1-3, 1862. Along with its outbuildings, pristine setting, and architectural integrity, this property contributes to the overall historic district. The property was part of Phases 3 and 4 of the battle on November 2, 1862. This property also contributes to the Unison Historic District [053-0692].

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category:	Domestic
Resource Type:	Single Dwelling
NR Resource Type:	Building
Historic District Status:	Contributing
Date of Construction:	Ca 1850
Date Source:	Site Visit
Historic Time Period:	Antebellum Period (1830 - 1860)
Historic Context(s):	Domestic, Subsistence/Agriculture
Other ID Number:	*No Data*
Architectural Style:	Other
Form:	*No Data*
Number of Stories:	2.0
Condition:	Fair
Threats to Resource:	None Known
Cultural Affiliations:	*No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

20980 Unison Road (53-692-16): ca. 1850; 1880; Two-story, frame (vinyl) I-house is the main block of this dwelling and appears to have been constructed during the late 19th century. This section features a gable roof with center front gable decorated with a sawn vergeboard and a diamond-shaped attic vent window. Other details include 2/2 windows (one with a segmentally-arched frame), a stone foundation, 2 interior brick chimneys, sidelights and transom around front door, and 3-bay porch with square posts and sawn brackets. To the side is a 2-story frame wing also clad in vinyl with an interior end brick chimneys and 2/2 windows. To its rear is a diminutive 1 ½-story stuccoed wing that may be of masonry construction. This may be an earlier mid-19th-century section.

August 2006: The ca. 1850, 1880 I-house or main block is a frame, two-story dwelling of irregular plan with additions to the west and south. The main block, western addition, and shed addition to the south of the building rests on a stone foundation, and the walls are clad in vinyl siding. Two-over-two, double-hung, vinyl replacement windows are common throughout the dwelling. The main block or I-house section of the dwelling appears to have been constructed during the late nineteenth century and is an interpretation of a Folk Victorian House. As is typical of I-house, decorative trim has been appended to the form. Along the northern or primary facade, the Ballenger House features a three-bay, one-story porch with square posts and sawn brackets, sidelights and transom around the front door, a segmentally-arched frame around the middle window on the second floor, and intersecting front gable decorated with sawn vergeboard and a diamond-shaped louvered window in the attic story. The main block has a side-gabled roof covered in asphlat shingles and features two interior-brick chimneys. To the west is a frame, two-story wing, which is also clad in vinyl siding and has an interior-end brick chimney. Immediately to the south is a diminutive one-and-a-half story stuccoed wing, which may be of masonry construction. The stuccoed wing is believed to be the original portion of the house and may date to the mid-nineteenth century. Between the stuccoed-wing and main block of the house, there is a two-story porch. At the time of the survey, a portion of the previously recorded standing-seam metal roof was visible where the stuccoed-wing's roof joined with the rear porch's roofline.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Foundation	Solid/Continuous	Stone	Rubble, Random
Roof	Gable	Asphalt	Shingle
Chimneys	Central interior	Brick	Cap, Corbeled
Windows	Sash, Double-Hung	Wood	2/2

Structural System and Exterior Treatment	Frame	Wood	Siding, Vinyl
Porch	1-story, 3-bay	Wood	Post, Square
Chimneys	Interior End	Brick	Cap, Corbeled

Secondary Resource Information

Secondary Resource #1

Resource Category: Agriculture/Subsistence
Resource Type: Silo
Date of Construction: 1910Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Domestic, Subsistence/Agriculture
Architectural Style: Other
Form: *No Data*
Condition: Poor
Threats to Resource: Neglect
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

August 2006: Directly east of the bank barn's wing is the ca. 1910 terra cotta tile silo, with standing seam metal roof. At the time of the survey, the silo did not appear to be in use.

April 2010: The resource has not undergone major changes since the last survey.

Secondary Resource #2

Resource Category: Agriculture/Subsistence
Resource Type: Corncrib
Date of Construction: 1920Ca
Date Source: Site Visit
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Domestic, Subsistence/Agriculture
Architectural Style: Other
Form: *No Data*
Condition: Excellent
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

August 2006: Located east of the garage and in a grassy space surrounded by one of the circular drives is the corncrib. The ca. 1920 central-aisle corncrib features concrete block piers, vertical wood siding, and a front-gabled roof of standing-seam metal. At the time of the survey, corn was being stored in the crib along the west elevation and hay in the eastern crib. The central-aisle was being utilized as storage space for a tractor. Since the ca. 2001 survey, the lean-to along the east elevation has been converted into horse stalls.

April 2010: The resource has not undergone major changes since the last survey.

Secondary Resource #3

Resource Category: Agriculture/Subsistence
Resource Type: Chicken House/Poultry House
Date of Construction: 1910Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)

Historic Context(s): Domestic, Subsistence/Agriculture
Architectural Style: Other
Form: *No Data*
Condition: Ruinous
Threats to Resource: Demolition
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

August 2006: At the time of the survey, the ca. 1910, two-bay, vertical sided, shed-roofed chicken coop could not be located. It is possible that the structure is no longer extant, and the rubble associated with a building just southeast of the silo is the remains of the chicken coop.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: *No Data*

Secondary Resource #4

Resource Category: Domestic
Resource Type: Garage
Date of Construction: 1920Ca
Date Source: Site Visit
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Domestic, Subsistence/Agriculture
Architectural Style: Other
Form: *No Data*
Condition: Excellent
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

August 2006: The ca. 1920, one-story, frame garage is located southeast of the main dwelling and along the gravel drive. It is the first outbuilding in the work yard. The rectangular garage features a gravel floor, a wood sill placed upon poured concrete, vertical board siding, and exposed rafter tails. The end-gabled roof is covered in sheets of corrugated metal. Immediately to the rear and attached to the garage is a five-bay, pole shed. The pole shed is used to house a variety of equipment including a horse trailer, tractor, and RV. A small wing visually attaches the shed to a stable. The two-story stable has a concrete block foundation and vertical barn board siding. On the first floor, the stable features four-pane sliding windows as well as internal louvered windows and double trolley doors. Double board and batten doors on the east elevation provide access to the second floor.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Secondary Resource #5

Resource Category: Agriculture/Subsistence
Resource Type: Smoke/Meat House
Date of Construction: 1880Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Domestic, Subsistence/Agriculture
Architectural Style: Other
Form: *No Data*
Condition: Fair
Threats to Resource: Neglect
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

August 2006: The outbuilding, immediately to the south of the main dwelling and within the lawn, is a ca. 1880, two-story, one-bay meat/smoke

house. The first floor is of stone construction, while the second is frame construction and clad in vertical board and batten siding. A corrugated metal, front-gabled roof covers the structure.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 2

Secondary Resource #6

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: Ca
Date Source: Site Visit
Historic Time Period: Antebellum Period (1830 - 1860)
Historic Context(s): Domestic, Subsistence/Agriculture
Architectural Style: Other
Form: *No Data*
Condition: Excellent
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

August 2006: Located south of the corncrib and east of the garage is a bank barn and attached wing. The mid- to late-nineteenth-century, two and a half story bank barn features a stone foundation, hand-hewn heavy-timber frame, vertical wood siding, and a standing-seam metal, side-gabled roof. The one-story, wing to the east of the bank barn in constructed of stone and framing and has a side-gabled roof. The first floor of the barn and wing are currently being utilized to house horses.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 2.5

Secondary Resource #7

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 1950Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Domestic, Subsistence/Agriculture
Architectural Style: *No Data*
Form: *No Data*
Condition: Fair
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

August 2006: Modern non-contributing shed.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District; Unison Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Lee, M. Amanda
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 8/1/2006
Dhr Library Report Number: *No Data*
Project Staff/Notes:

CRI: A Phase I Cultural Resource Survey of the 97 Acre Ortel Property in the Village of Unison, Loudoun County, Virginia

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 11/11/2001
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 35121 Bloomfield Road
Current	Bishop House

Property Addresses

Current - 35121 Bloomfield Road Route 626

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20141
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District; Unison Historic District.

Additional Property Information

Architecture Setting: Hamlet
Acreage: *No Data*
Site Description:

Sits along west side of Bloomfield Road; mature trees and bushes in yard.

April 2010: The resource has not undergone major changes since the last survey.

Garage: frame (weatherboard siding) raised stone foundation; gable-end (standing-seam metal)roof.
Workshop: Frame (weatherboard) workshop with gable roof clad in v-crimp metal and an exterior-end brick and concrete block chimney.

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

Historical significance:
This dwelling is an example of a ca. 1929 vernacular bungalow, typical of the time period. It is a contributing resource to the Unison Historic District.

April 2010: While this property contains historic resources, they post-date the period of significance of the Unison Battlefield Historic District (November 1-3, 1862) and are, therefore, considered non-contributing to the historic district. They do, however, contribute to the Unison Historic District [053-0692] that has a period of significance up to 1952.

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: 1929
Date Source: Site Visit/Owner
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Domestic

Other ID Number: *No Data*
Architectural Style: Craftsman
Form: *No Data*
Number of Stories: 1.0
Condition: Excellent
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

35121 Bloomfield Road; Bishop House (53-692-1): ca. 1929; 1-story, 3-bay, frame (stucco and false beveled siding), gable-end (standing-seam metal) vernacular bungalow on parged stone foundation. Details include 6/6 windows, a 2-bay front porch with square posts and plain pickets, 2 interior concrete block flues, exposed rafter ends, and a rectangular attic vent in front gable end.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Roof	Gable, Front	Metal	Standing Seam
Porch	1-story, 2-bay	Wood	Post, Square
Chimneys	Central interior	Concrete	Block
Foundation	Solid/Continuous	Stone	Parged
Structural System and Exterior Treatment	Frame	Wood	Stuccoed
Windows	Sash, Double-Hung	Wood	6/6

Secondary Resource Information

Secondary Resource #1

Resource Category: Domestic
Resource Type: Garage
Date of Construction: *No Data*
Date Source: *No Data*
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Domestic
Architectural Style: *No Data*
Form: *No Data*
Condition: *No Data*
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

No Data

Number of Stories: *No Data*

Secondary Resource #2

Resource Category: Agriculture/Subsistence
Resource Type: Workshop
Date of Construction: *No Data*
Date Source: *No Data*
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Domestic
Architectural Style: *No Data*
Form: *No Data*

Condition: *No Data*
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
No Data
Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District; Unison Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:
American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.
Project Bibliographic Information:
Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:
Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.
Project Bibliographic Information:
Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 12/1/2001

Dhr Library Report Number: *No Data*

Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21028 Unison Road
Current	Butterland

Property Addresses

Current - 21028 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20117
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District; Unison Historic District.

Additional Property Information

Architecture Setting: Hamlet
Acreage: *No Data*
Site Description:

8 acres. Front of house is hidden by mature boxwood hedge.

April 2010: The resource has not undergone major changes since the last survey.

Office: late 19th century; 1-story, gable-roofed (standing-seam metal), frame (weatherboard) office building that originally sat along road and was moved to this location. It was the office for Dr. Hoge, who owned the property during the late 19th century.

April 2010: The resource has not undergone major changes since the last survey.

Barn: mid-to late 19th century, hand-hewn timber-frame (board and batten), gable-end (standing-seam meal) barn with side lean-tos, one of which was originally a corncrib.

Garage: late 19thth century; frame (board and batten), gable-roofed meat house that was enlarged and converted into a garage in the 1950s.

Chicken coop: ca. 1900;1-story, 2-bay, frame (board and batten), gable-roofed chicken coop.

Pool and pool house: ca. 1987; frame (board and batten), gable-roofed pool house and adjoining modern in-ground pool (2 NC).

Surveyor Assessment:

Historical Significance:
This property, now named Butterland, is one of the earliest surviving buildings in Unison. It is thought to have been the home of William Gallaher, who purchased the land on which Unison is located in 1802. The front portion of the house is of stone construction and dates to ca. 1802. Like many dwellings in this community, it originally had two front entrances. During the late 19th century it was the home of Dr. Hoge, whose office originally sat along the road. The property has high architectural integrity as well as several outbuildings (including Dr. Hoge's office) and is a contributing resource to the Unison Historic District.

April 2010: The Unison Battlefield Historic District is significant under Criterion A, relating to the significant Battle of Unison that took place November 1-3, 1862. Along with its outbuildings, pristine setting, and architectural integrity, this property contributes to the overall historic district. The property was part of Phases 3 and 4 of the battle on November 2, 1862. This property also contributes to the Unison Historic District [053-0692].

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Contributing
Date of Construction: Ca 1802
Date Source: Site Visit/Written Data
Historic Time Period: Early National Period (1790 - 1829)
Historic Context(s): Domestic
Other ID Number: *No Data*
Architectural Style: Other
Form: *No Data*
Number of Stories: 2.0
Condition: Excellent
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

21028 Unison Road; Butterland (53-692-15): ca. 1800, 1850, 1950. This 2-story stone dwelling was constructed in at least three phases. The earliest ca. 1800 portion is the large 2-story, 3-bay central section with a semi-exterior-end chimney on one end and an interior-end chimney on the other. It originally had a central door which has since been enclosed into a window. The side, 2-bay, 2-story wing with exterior-end stone chimney was added shortly after and currently features a 1-bay pedimented portico and stucco scored to look like ashlar. The rear 2-story wing was added ca. 1850 and the enclosed porch and kitchen added in the 1950s. The plaster has been removed on the back of the house exposing the natural stone. Details include 2/2 windows, 6/6 windows, gable-end returns, and overhanging eaves.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	2/2
Chimneys	Exterior End	Stone	*No Data*
Structural System and Exterior Treatment	Masonry	Stone	Stuccoed
Roof	Gable, Side	Metal	Standing Seam
Foundation	Solid/Continuous	Stone	Rubble, Random
Porch	1-story, 1-bay	Wood	Post, Square

Secondary Resource Information

Secondary Resource #1

Resource Category: Commerce/Trade
Resource Type: Office/Office Building
Date of Construction: 1900Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Domestic
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Office: late 19th century; 1-story, gable-roofed (standing-seam metal), frame (weatherboard) office building that originally sat along road and was moved to this location. It was the office for Dr. Hoge, who owned the property during the late 19th century.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: *No Data*

Secondary Resource #2

Resource Category: Social/Recreational
Resource Type: Pool/Swimming Pool
Date of Construction: 1987Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Domestic
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Pool: modern in-ground pool.

April 2010: The resource has not undergone major changes since the last survey.

Secondary Resource #3

Resource Category: Social/Recreational
Resource Type: Pool House
Date of Construction: 1987Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Domestic
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

pool house: ca. 1987; frame (board and batten), gable-roofed pool house and adjoining modern in-ground pool.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: *No Data*

Secondary Resource #4

Resource Category: Domestic
Resource Type: Garage
Date of Construction: 1910Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Domestic
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Garage: late 19th century; frame (board and batten), gable-roofed meat house that was enlarged and converted into a garage in the 1950s.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: *No Data*

Secondary Resource #5

Resource Category: Agriculture/Subsistence
Resource Type: Chicken House/Poultry House
Date of Construction: 1910Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Domestic
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Chicken coop: ca. 1900;1-story, 2-bay, frame (board and batten), gable-roofed chicken coop.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: *No Data*

Secondary Resource #6

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: 1870Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Domestic
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Barn: mid-to late 19th century, hand-hewn timber-frame (board and batten), gable-end (standing-seam meal) barn with side lean-tos, one of which was originally a corncrib.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District; Unison Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 12/11/2001
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21091 Unison Road
Historic/Current	Glatton Folly

Property Addresses

Current - 21091 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20141
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District; Unison Historic District.

Additional Property Information

Architecture Setting: Hamlet
Acreage: *No Data*
Site Description:

Corner of Unison Rd. & Bloomfield Rd.; Picket fence in front, mature bushes in yard.

April 2010: The resource has not undergone major changes since the last survey.

Shed - 2 bay, gable roofed shed with German-lap siding
Garage - 1 bay, gable roofed frame garage with German-lap siding and v-crimp metal roof.

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

Historical significance:
Located at the intersection of Bloomfield and Unison Roads, this dwelling is one of the most visually prominent buildings in Unison. The 2 ½-story frame dwelling features two exterior brick chimneys on one gable end and a full-height 2-story portico on the other. The house, constructed in the early to mid-19th century, appears to have been remodeled during the late Victorian era. It was the home of H. W. Saffell, who ran the store next door, during the early 20th century. The house and 2 outbuildings have good architectural integrity and are contributing resources to the Unison Historic District.

April 2010: The Unison Battlefield Historic District is significant under Criterion A, relating to the significant Battle of Unison that took place November 1-3, 1862. Along with its outbuildings, pristine setting, and architectural integrity, this property contributes to the overall historic district. The property was part of Phases 3 and 4 of the battle on November 2, 1862. This property also contributes to the Unison Historic District [053-0692].

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Contributing
Date of Construction: Ca 1820
Date Source: Site Visit
Historic Time Period: Early National Period (1790 - 1829)

Historic Context(s): Domestic
Other ID Number: *No Data*
Architectural Style: *No Data*
Form: *No Data*
Number of Stories: 0.0
Condition: *No Data*
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

21091 Unison Road; Glatton Folly (53-692-2): ca. 1820 with later alterations; 2 ½-story, 3-bay, frame (German lap siding), gable-roofed (standing-seam metal), vernacular dwelling on stone foundation with two front gable-roofed dormers, 2 exterior-end brick chimneys on west end, 3-bay front porch with scroll brackets (one bay enclosed with paired 2/2 windows), and double-hung 2/2-sash windows with louvered wooden shutters. Other details include gable-end returns, a plain frieze board, corner boards, a transom over the front door, and a full-height 2-story portico on the gable end. This portico, with a barrel vault and gable-end returns, is supported by rectangular tapered supports on paneled plinths and shelters a 2nd-story balcony that is supported by brackets with pendants. Doors on each level lead out to either the balcony or the first-floor deck of the portico. It appears that this house was remodeled (new siding, windows, porches) sometime in the late 19th century to reflect more Victorian-era designs. Later additions include a rear/side 1-story shed-roofed wing.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	2/2
Chimneys	Exterior End	Brick	Bond, American
Roof	Gable, Side	Metal	Standing Seam
Foundation	Solid/Continuous	Stone	Rubble, Random
Structural System and Exterior Treatment	Frame	Wood	Weatherboard
Porch	1-story, 3-bay	Wood	Post, Square

Secondary Resource Information

Secondary Resource #1

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 1920Ca
Date Source: Site Visit
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Domestic
Architectural Style: *No Data*
Form: *No Data*
Condition: *No Data*
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Shed - 2 bay, gable roofed shed with German-lap siding

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Secondary Resource #2

Resource Category: Domestic
Resource Type: Garage
Date of Construction: 1920Ca

Date Source: Site Visit
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Domestic
Architectural Style: *No Data*
Form: *No Data*
Condition: *No Data*
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Garage - 1 bay, gable roofed frame garage with German-lap siding and v-crimp metal roof.

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District; Unison Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield
Protection Program Grant 2255-06-010

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David

Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield
Protection Program Grant 2255-06-010

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 12/12/2001

Dhr Library Report Number: *No Data*

Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield
Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21282 Unison Road

Property Addresses

Current - 21282 Unison Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located southeast of Unison Road, the house is sited at a level grade to the road with a deep setback. A gravel driveway passes between a large electrically-operated wrought iron gate, to create a large circular driveway in front of the house and the secondary structures. A concrete walkway leads from the driveway to the main house, while a brick walkway leads to the stable. A four-board fence encloses the property's agricultural fields. Mature trees and shrubs landscape the yard around the house.

March 2010: A stable is located southwest of the main house and a garage to the northwest of the stable. A shed sits northwest of the garage.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 2000
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Colonial Revival
Form: *No Data*
Number of Stories: 1.5

Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Constructed ca, 2000, this one-and-a-half story, three-bay Colonial Revival-style house rests on a solid foundation. It has a gable roof clad in asphalt shingles that contains three gabled wall dormers. The dwelling features hardiplank siding, 6/6-sash double-hung vinyl windows, a paneled front door with sidelights, and a nine-bay, wraparound front porch with Tuscan columns and a metal roof.

Secondary Resource Information

Secondary Resource #1

Resource Category: Agriculture/Subsistence
Resource Type: Stable
Date of Construction: 2000Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Stable: This ca. 2000, center-aisle stable has board-and-batten siding and a gable roof clad in asphalt shingles. It has a lean-to on its southwest side and a porch on its northeast side.
Number of Stories: *No Data*

Secondary Resource #2

Resource Category: Domestic
Resource Type: Garage
Date of Construction: 2000Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Garage: This ca. 2000, four-bay garage has a gable roof and metal siding.
Number of Stories: *No Data*

Secondary Resource #3

Resource Category: DSS Legacy
Resource Type: Shed

Date of Construction: 2000Ca
Date Source: *No Data*
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Shed: This ca. 2000, multi-bay open shed has a gable roof clad in v-crimp metal.

Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Descriptive	Methodist Church Parsonage
Function/Location	House, 21148 Unison Road

Property Addresses

Current - 21148 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20141
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Hamlet
Acreage: *No Data*
Site Description:

2 Rail fences in front. Sits just west of church.

April 2010: The resource has not undergone major changes since the last survey.

April 2010: None.

Surveyor Assessment:

Historical Significance:
This Cape Cod–type vernacular brick dwelling was constructed around 1955 as a parsonage for the Methodist church next door. It does not contribute to the Unison Historic District.

April 2010: The property contains modern resources and is, therefore, non-contributing to the Unison Battlefield Historic District. The resources would also be non-contributing to the Unison Historic District [053-0692] where the period of signficance ends in 1952.

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Religion
Resource Type: Parsonage/Glebe
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1955
Date Source: *No Data*
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning, Domestic, Religion
Other ID Number: *No Data*
Architectural Style: Vernacular
Form: *No Data*
Number of Stories: 1.5

Condition: Good

Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

21148 Unison Road; Methodist Church Parsonage (53-692-8): 1955; 1 ½-story, 6-bay, brick, gable-roofed vernacular Cape Cod-type dwelling with 4 front gable-roofed dormers, 6/6 windows; wooden shutters, scalloped vergeboard, and interior-end brick chimney (NC).

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	6/6
Foundation	Solid/Continuous	Brick	Bond, Stretcher
Structural System and Exterior Treatment	Masonry	Brick	Bond, Flemish

Secondary Resource Information

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District

Local Historic District Name: *No Data*

Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*

Investigator: Unison Preservation Society

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 12/11/2001
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 35066 Bloomfield Road

Property Addresses

Current - 35066 Bloomfield Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located on the east side of Bloomfield Road, directly across from the intersection of Bloomfield and Furr roads, the house is sited at a level grade to the road with a shallow setback. A gravel driveway runs directly in front of the house to the north. A terraced brick walkway leads from the driveway to the front door and south of the house. Small bushes and shrubs line the proximity of the house.

March 2010: A barn rests to the southwest of the main house, in a field along Bloomfield Road.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1987
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Vernacular
Form: *No Data*
Number of Stories: 1.0
Condition: Good

Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Constructed ca. 1987, this one-story, four-bay, vernacular, pre-fabricated, frame house rests on a concrete foundation. The dwelling has vinyl siding and a gable roof clad in asphalt shingles. It features 1/1-sash double-hung vinyl windows, louvered shutters, an exterior-end brick chimney with a corbelled cap, and a front concrete stoop.

Secondary Resource Information

Secondary Resource #1

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: 1990Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Barn: This ca. 1990, three-bay barn has a gambrel roof clad in v-crimp metal with a large lean-to on either side.
Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:
Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.
Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*

Investigator: Unison Preservation Society

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 35091 Bloomfield Road

Property Addresses

Current - 35091 Bloomfield Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located on the west side of Bloomfield Road, the house is sited at a level grade to the road with an average setback. A gravel driveway on the north side of the house creates a gravel parking area and curves to access the front of the garage. A walkway made of concrete pavers leads from the driveway to the front door. Mature trees line the lot's southern border and other small trees landscape the rest of the lot.

March 2010: A garage is placed northwest of the main house.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1960
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Ranch
Form: *No Data*
Number of Stories: 1.0
Condition: Good

Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Constructed ca. 1960, this one-story, four-bay, Ranch-style frame house rests on a concrete foundation. The stuccoed dwelling has a gable roof clad in asphalt shingles. It features 6/6-sash double-hung, vinyl windows, vinyl shutters, a paneled door with a fanlight, and an exterior-end brick chimney. A two-bay, frame wing with vinyl siding extends off the south side of the house. The front of the house has a concrete stoop with wood railing.

Secondary Resource Information

Secondary Resource #1

Resource Category: Domestic
Resource Type: Garage
Date of Construction: 1970Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Garage: This ca. 1970, one-car, gable-end garage has vinyl siding and a roof clad in asphalt shingles.
Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:
American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.
Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 20493 Furr Road

Property Addresses

Current - 20493 Furr Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Placed on the northwest corner junction of Furr and Bloomfield roads, the house is sited slightly above the grade of the road with a very shallow setback. A stonewall lines and supports the southeast corner of the front yard. A dirt driveway runs to the west side of the house. A gravel driveway behind the house allows access to the barn and cottage. A single-board and wire fence encloses the property's agricultural fields. Numerous trees, a boxwood hedge, and several shrubs landscape the area around the house.

March 2010: A cottage is placed directly behind the house to the north. A barn rests directly beside the cottage to the west. A turn-out shed is placed northwest of the barn.

Surveyor Assessment:

March 2010: The central part of the main house dates to ca. 1880 and, according to the current owner was the home of John Sinclair, one of Mosby's Rangers. He believes that the house may pre-date the Civil War although it does not appear on the Yardley Taylor Map. Since the house is historic, it could perhaps be included in a larger rural historic district in the area that would include an agricultural, residential, social, religious, and educational context. The property contains modern (post-1960) outbuildings that are therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1880
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Vernacular

Form: *No Data*
Number of Stories: 0.0
Condition: Good
Threats to Resource: None
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: This one-and-a-half-story, vernacular, random-rubble stone dwelling was constructed ca. 1880 and rests on a random-rubble stone foundation. At its center is a frame house that has been stone-veneered. The dwelling has a cross-gable roof clad in asphalt shingles, 1/1-sash and four-light windows, and an exterior-end stone chimney with a corbelled cap. Front and rear shed-roofed porches have been enclosed using multiple-light windows and modern siding. A modern deck is located in the rear. The enclosed front porch covers the Masonite siding that was once on the front of the house.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Vinyl	1/1
Roof	Gable	Asphalt	Shingle
Porch	1-story	Wood	Enclosed
Windows	Fixed	Wood	4-light
Foundation	Solid/Continuous	Stone	Rubble, Random
Structural System and Exterior Treatment	Masonry	Stone	Random Rubble
Chimneys	Exterior End	Stone	Rubble, Random

Secondary Resource Information

Secondary Resource #1

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 1990Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Turn-out Shed: This ca. 1990, gable-roofed, two-bay turn-out shed is clad in v-crimp metal as siding and roofing.

Number of Stories: *No Data*

Secondary Resource #2

Resource Category: Domestic
Resource Type: Secondary Dwelling
Date of Construction: 1950Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Cottage: Constructed ca. 1950, this one-story, three-bay cottage rests on a cinder block foundation. It has a gable roof clad in asphalt shingles and vinyl siding.

Number of Stories: 1

Secondary Resource #3

Resource Category: Agriculture/Subsistence

Resource Type: Barn

Date of Construction: 2005Ca

Date Source: Site Visit

Historic Time Period: Reconstruction and Growth (1866 - 1916)

Historic Context(s): Architecture/Community Planning

Architectural Style: *No Data*

Form: *No Data*

Condition: Good

Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Barn: Constructed ca. 2005, this one-and-a-half-story barn has a gable roof clad in asphalt shingles. It features T-111 siding, four gabled dormers, a cupola, and a large deck on its south side.

Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Battlefield Historic District

Local Historic District Name: *No Data*

Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 20781 Unison Road
Current	Tir No Nog

Property Addresses

Current - 20781 Unison Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located on the west side of Unison Road, the house is sited at a level grade to the road with an average setback. A gravel driveway north of the house leads to the attached garage. A three-board fence is placed on either side of the driveway's entrance. A concrete walkway leads from the driveway to the front door. Small trees and shrubs landscape the lot.

March 2010: No secondary structures.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 2000
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: *No Data*
Form: *No Data*
Number of Stories: 2.0
Condition: Good

Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Constructed ca. 2000, this two-story, multiple-bay, U-shaped, modern dwelling rests on a solid stone foundation. The stuccoed house has a hipped roof clad in asphalt shingles. It has a central two-story, three-bay hip-roofed section and side one-story lower hip-roofed wings with an attached hip-roofed, three-car garage connected to the south wing. It features 1-foot x 1-foot casement windows, an interior-end stone chimney, and a single-bay, gable-roofed entryway.

Secondary Resource Information

Historic District Information

Historic District Name: Unison Battlefield Historic District

Local Historic District Name: *No Data*

Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*

Investigator: Unison Preservation Society

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 20830 Unison Road

Property Addresses

Current - 20830 Unison Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located off the east side of Unison Road, the house is sited slightly above the grade of the road with an average setback. A gravel driveway shared with property number 053-6087-0029, placed on the north side of the house leads straight back towards the attached garage. Numerous mature pine and hardwood trees landscape the front and backyards of the property.

March 2010: No secondary structures.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1993
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Colonial Revival
Form: *No Data*
Number of Stories: 2.0
Condition: Good
Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Constructed ca. 1993, this two-story, five-bay, Colonial Revival-style frame house rests on a solid foundation. The structure has vinyl siding and a gable roof clad in asphalt shingles. It features 6/6-sash double-hung vinyl windows, a central front gable, and an exterior-end brick chimney. A gable-roofed wing with a two-car garage and two gable dormers is attached to the east side of the house. The front of the house has a three-bay wraparound porch with square posts and a modern railing.

Secondary Resource Information

Historic District Information

Historic District Name: Unison Battlefield Historic District

Local Historic District Name: *No Data*

Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*

Investigator: Unison Preservation Society

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21070 Unison Road

Property Addresses

Current - 21070 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20117, 20141
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District; Unison Historic District.

Additional Property Information

Architecture Setting: Hamlet
Acreage: *No Data*
Site Description:

House sits at right angle to road, mature trees and bushes,
3-board fence.

April 2010: The resource has not undergone major changes since the last survey.

Shed: ca. 1950; 1-bay, shed-roofed shed clad in corrugated metal.

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

Historical Significance:
This late-19th-century log and frame vernacular dwelling has a fair amount of architectural integrity and is a contributing resource to the Unison Historic District.

April 2010: While this property contains historic resources, they post-date the period of significance of the Unison Battlefield Historic District (November 1-3, 1862) and are, therefore, considered non-contributing to the historic district. They do, however, contribute to the Unison Historic District [053-0692] that has a period of significance up to 1952.

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1880
Date Source: *No Data*
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Domestic
Other ID Number: *No Data*
Architectural Style: *No Data*

Form: *No Data*
Number of Stories: 1.5
Condition: *No Data*
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

21070 Unison Road (53-692-13): ca. 1880; 1 ½-story; 2-bay, gable-end (standing-seam metal), log (stucco), vernacular dwelling that is sited at a right angle to the road. Details include 6/6 windows on first floor, 6-light frieze windows in ½ story, batten shutters, 2 bays deep along road; pedimented 1-bay entrance stoop with modern wrought-iron supports, and an exterior-end stone chimney on the end on the side/rear lean-to. Additions include the new siding, a shed-roofed wing on the front and a rear gable-roofed wing with exterior-end concrete block (parged) chimney.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	6/6
Porch	1-story, 1-bay	Metal	Cast Metal Supports
Roof	Gable	Metal	Standing Seam
Structural System and Exterior Treatment	Log	Wood	Stuccoed
Chimneys	Exterior End	Stone	Rubble, Random
Foundation	Solid/Continuous	Stone	Rubble, Random

Secondary Resource Information

Secondary Resource #1

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 1950Ca
Date Source: *No Data*
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Domestic
Architectural Style: *No Data*
Form: *No Data*
Condition: *No Data*
Threats to Resource: *No Data*
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Shed: ca. 1950; 1-bay, shed-roofed shed clad in corrugated metal.
April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District; Unison Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 12/11/2001
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21075 Unison Rd.

Property Addresses

Current - 21075 Unison Rd. Route 630

County/Independent City(s):	Loudoun (County)
Incorporated Town(s):	*No Data*
Zip Code(s):	20141
Magisterial District(s):	*No Data*
Tax Parcel(s):	*No Data*
USGS Quad(s):	BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District; Unison Historic District.

Additional Property Information

Architecture Setting: Hamlet

Acreage: *No Data*

Site Description:

Mature trees & boxwood.

April 2010: The resource has not undergone major changes since the last survey.

April 2010: None. The resource has not undergone major changes since the last survey.

Surveyor Assessment:

Historical Significance:
This 2-story, 3-bay, frame dwelling is a typical example of a late-19th-to early-20th-century I-house. It is a contributing resource to the Unison Historic District.

April 2010: While this property contains historic resources, they post-date the period of significance of the Unison Battlefield Historic District (November 1-3, 1862) and are, therefore, considered non-contributing to the historic district. They do, however, contribute to the Unison Historic District [053-0692] that has a period of significance up to 1952.

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category:	Domestic
Resource Type:	Single Dwelling
NR Resource Type:	Building
Historic District Status:	Non-contributing
Date of Construction:	Ca 1910
Date Source:	Site Visit
Historic Time Period:	Reconstruction and Growth (1866 - 1916)
Historic Context(s):	Domestic
Other ID Number:	*No Data*
Architectural Style:	*No Data*
Form:	I-House
Number of Stories:	2.0

Condition: Good

Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

21075 Unison Road (53-692-19): ca. 1910; 2-story, 3-bay, gable-roofed (standing-seam metal), frame (German-lap siding) I-house with gable-end returns, stone foundation, 6/6 windows, modern 1-bay pedimented portico, and rear 2-story ell with enclosed side porches.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	6/6
Foundation	Solid/Continuous	Stone	Rubble, Random
Roof	Gable, Side	Metal	Standing Seam
Porch	1-story, 1-bay	Wood	Post, Square
Structural System and Exterior Treatment	Frame	Wood	Weatherboard

Secondary Resource Information

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District; Unison Historic District

Local Historic District Name: *No Data*

Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Grant: Federal

Project Review File Number: *No Data*

Investigator: Unison Preservation Society

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 12/11/2001

Dhr Library Report Number: *No Data*

Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21092 Unison Road

Property Addresses

Current - 21092 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20117, 20141
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District; Unison Historic District.

Additional Property Information

Architecture Setting: Hamlet
Acreage: *No Data*
Site Description:

Picket fence in front. Mature bushes and trees.
.93 acres.

April 2010: The resource has not undergone major changes since the last survey.

None

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

Historical Significance:
This Minimal Ranch–type vernacular dwelling was constructed around 1971 and does not contribute to the Unison Historic District.

April 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District. The resources would also be non-contributing to the Unison Historic District [053-0692].

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1971
Date Source: *No Data*
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Domestic
Other ID Number: *No Data*
Architectural Style: *No Data*
Form: *No Data*
Number of Stories: 0.0

Condition: *No Data*

Threats to Resource: *No Data*

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

21092 Unison Road (53-692-11): ca. 1971; 1-story, 4-bay, Minimal Ranch with bowed bay window, 1/1 windows, Masonite siding and asphalt shingle gable roof (NC).

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Roof	Gable, Side	Asphalt	Shingle
Foundation	Solid/Continuous	Concrete	Parged
Windows	Sash, Double-Hung	Wood	1/1
Structural System and Exterior Treatment	Frame	Wood	*No Data*

Secondary Resource Information

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District; Unison Historic District

Local Historic District Name: *No Data*

Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*

Investigator: Unison Preservation Society

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 11/11/2001
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 35075 Bloomfield Road
Current	Warwickshire Den

Property Addresses

Current - 35075 Bloomfield Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located on the west side of Bloomfield Road, the house is sited at a level grade to the road with an average setback. A gravel driveway provides access to the barn and both the front and rear of the house. A three-board fence encloses the property's agricultural fields. A few mature trees and small bushes landscape the area around the house and barn.

March 2010: A barn is located northeast of the main house.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 2002
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Ranch
Form: *No Data*
Number of Stories: 1.0
Condition: Good

Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Constructed ca. 2002, this one-story, five-bay, Ranch-style dwelling is constructed of square-notched logs that overlap and resemble "Lincoln logs." It rests on a concrete foundation and features a gable roof clad in asphalt shingles, paired and single 1/1-sash double-hung windows and an exterior-end stone chimney. The front of the house has a two-bay, shed-roofed porch with square posts and a vertical picket balustrade.

Secondary Resource Information

Secondary Resource #1

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: 2002Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Barn: This ca. 2002 barn has v-crimp metal siding and a gable roof clad in v-crimp metal. It features a sliding door, a cupola, and a four-bay porch on its west side.
Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:
Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*

Investigator: Unison Preservation Society

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21133 Foxcroft Road

Property Addresses

Current - 21133 Foxcroft Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Placed on the west side of Foxcroft Road, the house is sited at a level grade to the road with a shallow setback. A gravel driveway runs northeast of the house. Rocks are used to create planting beds in the front yard. A three-board fence surrounds the property's agricultural fields. Mature trees and small shrubs landscape the area around the house.

March 2010: A large barn and a shed are located north of the main house.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1973
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Ranch
Form: *No Data*
Number of Stories: 1.0
Condition: Good
Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Constructed ca. 1973, this one-story, five-bay, Ranch-style, stone dwelling rests on a stone foundation. The dwelling has a hipped roof clad in asphalt shingles and features 1/1-sash double-hung windows, overhanging eaves, and a central-interior brick chimney.

Secondary Resource Information

Secondary Resource #1

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: 1975Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: *No Data*
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Barn: This ca. 1975 barn has a gable roof clad in v-crimp metal. Shed-roofed wings extend off its northeast and northwest sides.

Number of Stories: *No Data*

Secondary Resource #2

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 1975Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: *No Data*
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Shed: This ca. 1975 two-bay, open shed has vertical-board siding and a shed roof clad in v-crimp metal.

Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21226 Unison Road

Property Addresses

Current - 21226 Unison Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located off the south side of Unison Road, the house is sited at a level grade to the road with a deep setback. A gravel driveway (shared with property #053-6087-0043) curves in front of the house to the west side and a parking area. A three-board fence surrounds the property's agricultural fields. Scattered trees landscape the area surrounding the house.

March 2010: A barn is located east of the house and a tractor shed is placed north of the barn.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1982
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Ranch
Form: *No Data*
Number of Stories: 2.0
Condition: Good

Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Constructed ca. 1982, this two-story, three-bay, split-level, Ranch-style dwelling rests on a raised brick foundation. The house features a gable roof clad in asphalt shingles, an exterior-end brick chimney, and vinyl siding on the second floor. The integral, four-bay, two-story front porch has square post supports.

Secondary Resource Information

Secondary Resource #1

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: 1990Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Barn: This ca. 1990, gable-roofed, frame barn has board-and-batten siding and an asphalt-shingle roofing.
Number of Stories: *No Data*

Secondary Resource #2

Resource Category: Agriculture/Subsistence
Resource Type: Shed,Vehicle/Equipment
Date of Construction: 1990Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Tractor Shed: This ca. 1990, tractor shed has T-111 siding, a gable roof clad in asphalt shingles, and a two-bay, run-in shed with a shed roof attached to its south end.
Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Battlefield Historic District

Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 35005 Bloomfield Road

Property Addresses

Current - 35005 Bloomfield Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located on the south side of Bloomfield Road, the house is sited at a level grade to the road with a shallow setback. A gravel driveway on the west side of the house leads back to the barn. Large cedar trees line the east side of the driveway and numerous other small trees and shrubs landscape the lot.

March 2010: A barn is located southwest of the main house.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1975
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Vernacular
Form: *No Data*
Number of Stories: 1.0
Condition: Good
Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Constructed ca. 1975, this one-story, four-bay, vernacular frame house rests on a concrete foundation. This cross-gable dwelling has vinyl siding and a roof clad in asphalt shingles. It features 1/1-sash double-hung vinyl windows, a two-light door, and a concrete-block interior-end chimney. A concrete stoop surrounded by a porch raised above the ground by cinder block piers extends off the front of the house.

Secondary Resource Information

Secondary Resource #1

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: 1980Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Barn: This ca. 1980, gable-end barn is constructed from plywood.

Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*

Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book

Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*

Investigator: Unison Preservation Society

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 35108 Bloomfield Road

Property Addresses

Current - 35108 Bloomfield Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Placed on the east side of Bloomfield Road, the house is sited at a level grade to the road with a deep setback. A paved driveway, shared with property 053-6087-0032, on the northeast side of the house leads back to the garage. Mature trees and trimmed bushes and shrubs landscape the lot.

March 2010: A garage is placed northeast of the main house.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

[This property was originally recorded under the address of 31508 Bloomfield Road. The corrected address is 35108 Bloomfield Road.]

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1990
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning, Domestic
Other ID Number: *No Data*
Architectural Style: Ranch
Form: Rectangular
Number of Stories: 1.0

Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Constructed ca. 1990, this one-story, six-bay, Ranch-style dwelling rests on a solid concrete foundation. The house has a gable roof with two projecting cross gables clad in asphalt shingles. The central portion of the house is stone and the cross-gabled wings are stucco. A one-bay pedimented porch is located at the entrance.

Secondary Resource Information

Secondary Resource #1

Resource Category: Domestic
Resource Type: Garage
Date of Construction: 1995Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning, Domestic
Architectural Style: No discernible style
Form: Rectangular
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
March 2010: Garage: This ca. 1995, three-car garage is covered in a stone veneer. It has a gable roof clad in asphalt shingles and three gable-roofed dormers.
Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Maral S. Kalbian
Organization/Company: Maral S. Kalbian, LLC
Photographic Media: Digital
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:
Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 35112 Bloomfield Road

Property Addresses

Current - 35112 Bloomfield Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located on the east side of Bloomfield Road, the house is sited at a level grade to the road with a deep setback. A paved driveway, shared with property 053-6087-0032, curves in front of the house. A pea pebble walkway leads from the driveway to the front door. Mature trees and trimmed shrubs landscape the lot.

March 2010: No secondary structures.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1987
Date Source: Local Records
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Ranch
Form: *No Data*
Number of Stories: 1.0
Condition: Good

Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Constructed ca. 1987, this one-story, six-bay, frame Ranch-style house features a large interior brick chimney, multi-light vinyl windows, a gable roof clad in asphalt shingles, and vinyl siding. A four-bay pergola fronts the house, which includes a recessed entry bay with large bay windows.

Secondary Resource Information

Historic District Information

Historic District Name: Unison Battlefield Historic District

Local Historic District Name: *No Data*

Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: Kalbian, Maral

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*

Investigator: Unison Preservation Society

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 35113 Bloomfield Road

Property Addresses

Current - 35113 Bloomfield Road

County/Independent City(s):	Loudoun (County)
Incorporated Town(s):	*No Data*
Zip Code(s):	*No Data*
Magisterial District(s):	*No Data*
Tax Parcel(s):	*No Data*
USGS Quad(s):	BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural

Acreage: *No Data*

Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located on the west side of Bloomfield Road, the house is sited at a level grade to the road with a shallow setback. A gravel driveway runs north of the house. A concrete walkway leads from the driveway to the front door. A mixture of wood picket and three-board fencing encloses the backyard. Mature trees and numerous shrubs landscape the lot.

March 2010: A shed is placed southwest of the main house, in the backyard.

Surveyor Assessment:

March 2010: The property contains modern (post-1960) resources and is, therefore, non-contributing to the Unison Battlefield Historic District.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category:	Domestic
Resource Type:	Single Dwelling
NR Resource Type:	Building
Historic District Status:	Non-contributing
Date of Construction:	Ca 1972
Date Source:	Site Visit
Historic Time Period:	The New Dominion (1946 - 1991)
Historic Context(s):	Architecture/Community Planning
Other ID Number:	*No Data*
Architectural Style:	Vernacular
Form:	*No Data*
Number of Stories:	2.0
Condition:	Good
Threats to Resource:	None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Constructed ca. 1972, this four-bay, vernacular frame house was raised to two stories in 2001: it was originally one story. Resting on a solid concrete foundation, the house is clad in vinyl siding with a gable roof covered in asphalt shingles. Details include 6/6-sash double-hung vinyl windows, paneled shutters, and an exterior-end stone chimney. The front of the house has a shed-roofed, thirteen-bay wraparound porch with turned spindles and balusters.

Secondary Resource Information

Secondary Resource #1

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 2001Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Shed: Constructed ca. 2001, this two-story, three-bay shed has vinyl siding, a gable roof clad in asphalt shingles, 6/6-sash double-hung windows, and a five-bay wraparound front porch.

Number of Stories: *No Data*

Historic District Information

Historic District Name: Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*

Investigator: Unison Preservation Society

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21097-21099 Unison Road
Current	Langcor House

Property Addresses

Current - 21097-21099 Unison Road Route 630

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): 20141
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District; Unison Historic District.

Additional Property Information

Architecture Setting: Hamlet
Acreage: *No Data*
Site Description:

Residential Yard; Picket fenced rear yard, raised beds in front, sits right off road.

April 2010: The resource has not undergone major changes since the last survey.

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

Historical significance:
This house, constructed in the early to mid-19th century, features log and frame sections. The frame section is clad in stucco and contains two front doors. It was the home of Charles Osbourne, postmaster and saddlemaker. Part of the building may have been used for commercial purposes. It is a contributing resource to the Unison Historic District.

April 2010: The Unison Battlefield Historic District is significant under Criterion A, relating to the significant Battle of Unison that took place November 1-3, 1862. Along with its outbuildings, pristine setting, and architectural integrity, this property contributes to the overall historic district. The property was part of Phases 3 and 4 of the battle on November 2, 1862. This property also contributes to the Unison Historic District [053-0692].

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Contributing
Date of Construction: Ca 1820
Date Source: Site Visit
Historic Time Period: Early National Period (1790 - 1829)
Historic Context(s): Domestic
Other ID Number: *No Data*
Architectural Style: Other

Form: *No Data*
Number of Stories: 2.0
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

21097 Unison Road; Langcor House (53-692-3): ca. 1830 with later additions; 2-story, gable-roofed dwelling composed of a 5-bay frame section clad in stucco with a gable roof of standing-seam metal, 2 interior-end brick flues, gable-end returns, two front doors, 2/2 windows, and a modern 3-bay front porch with square posts. To the east is a diminutive, 3-bay, log wing with interior-end brick flue, 6/6 windows, a central door flanked by 1-story projecting rectangular bay windows, and a rear shed-roofed wing. It is uncertain which section is earlier, but it appears that the two parts of the house were constructed fairly close to each other sometime during the first half of the 19th century. Perhaps the exposed log section was used for commercial purposes. Both sections have undergone a fair amount of alteration. This was the home of Charles Osbourne, a postmaster and saddlemaker.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	2/2
Foundation	Solid/Continuous	Stone	Rubble, Random
Structural System and Exterior Treatment	Frame	Wood	*No Data*
Roof	Gable, Side	Metal	Standing Seam
Chimneys	Interior stove flue	Brick	*No Data*
Porch	1-story, 3-bay	Wood	Post, Square

Secondary Resource Information

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District; Unison Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 11/11/2001
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 20836 Unison Road
Current	Little Brook Farms

Property Addresses

Current - 20836 Unison Road

County/Independent City(s): Loudoun (County)
Incorporated Town(s): *No Data*
Zip Code(s): *No Data*
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Rural
Acreage: *No Data*
Site Description:

2009/2010:The U-shaped Unison Battlefield Historic District is located in the lower Loudoun Valley at the eastern foothills of the Blue Ridge Mountains. Characterized by a rolling terrain, the rural landscape includes open and forested areas that are little changed from the time of the battle in 1862. Several tributaries of Goose Creek run through the district, intersecting the impressive network of unpaved narrow roads lined by stone walls. The community of Upperville and hamlet of Unison are also included within the boundaries.

March 2010: Located off the east side of Unison Road with a fairly deep setback, the house is sited slightly below the grade of the road. A gravel driveway shared with property number 053-6087-0028, leads past the garage north of the main house. A wire fence marks the southern border of the property. A few mature trees and small shrubs landscape the lot.

March 2010: A garage is located northwest of the house. A fallen shed ruin rests beside the house to the north. A barn is located directly behind the main house to the east.

Surveyor Assessment:

March 2010: While this property contains historic resources, they post-date the period of significance of the Unison Battlefield Historic District (November 1-3, 1862) and are, therefore, considered non-contributing to the historic district. They could perhaps be included in a larger rural historic district in the area that would include an agricultural, residential, social, religious, and educational context.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: Non-contributing
Date of Construction: Ca 1910
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning
Other ID Number: *No Data*
Architectural Style: Vernacular
Form: *No Data*

Number of Stories: 2.0
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Constructed ca. 1910, this two-story, three-bay, vernacular frame dwelling rests on a poured concrete foundation. The house has aluminum siding and a hipped roof clad in v-crimp metal. It features 2/2-sash double-hung, wood windows, overhanging eaves, and a central-interior brick flue. A hip-roofed wing extends off the rear with a shed-roofed porch to the north and a screened-in porch to the south connecting the wing and the main house.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	2/2
Structural System and Exterior Treatment	Frame	Wood	Siding, Aluminum
Foundation	Solid/Continuous	Concrete	Parged
Roof	Hipped	Metal	V-Crimp
Porch	1-story	Wood	*No Data*
Chimneys	Central interior	Brick	Flue

Secondary Resource Information

Secondary Resource #1

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: 1940Ca
Date Source: Site Visit
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: *No Data*
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Barn: This ca. 1940 concrete-block barn has a gambrel roof clad in v-crimp metal.

Number of Stories: *No Data*

Secondary Resource #2

Resource Category: Domestic
Resource Type: Garage
Date of Construction: 1930Ca
Date Source: Site Visit
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: *No Data*
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Garage: This ca. 1930, two-car garage has board-and-batten siding, a shed roof clad in v-crimp metal, and double-leaf sliding door s.

Number of Stories: *No Data*

Secondary Resource #3

Resource Category: Unknown
Resource Type: Foundation
Date of Construction: 1910Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning
Architectural Style: *No Data*
Form: *No Data*
Condition: *No Data*
Threats to Resource: Deterioration
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

March 2010: Ruin: This ca. 1910 shed ruin had a gable roof clad in v-crimp metal and weatherboard siding.

Historic District Information

Historic District Name: Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*

Survey Date: 1/1/2010

Dhr Library Report Number: *No Data*

Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 21164 Unison Road
Historic	Unison School
Current	Summergreen Farm

Property Addresses

Current - 21164 Unison Road Route 630

County/Independent City(s):	Loudoun (County)
Incorporated Town(s):	*No Data*
Zip Code(s):	20117, 20141
Magisterial District(s):	*No Data*
Tax Parcel(s):	*No Data*
USGS Quad(s):	BLUEMONT

Property Evaluation Status

Not Evaluated

This Property is associated with the Unison Historic District/Unison Battlefield Historic District.

Additional Property Information

Architecture Setting: Hamlet

Acreage: *No Data*

Site Description:

Sits back off road, 3 board fence in front.

April 2010: The resource has not undergone major changes since the last survey.

Shed: Modern; 1-story, gable-end shed with T-1-11 siding and a corrugated metal roof (NC).
Shed: Modern; 1-story, 3-bay shed with Masonite siding, and gable roof of asphalt shingle (NC).

April 2010: The resource has not undergone major changes since the last survey.

Surveyor Assessment:

Historical Significance:
Constructed ca. 1890 as the Unison School, this building is currently used as a dwelling and has undergone a fair amount of alteration since it ceased being a school in the late 1910s. It is the only resource in Unison related to education and is a contributing resource to the Unison Historic District.

April 2010: While this property contains historic resources, they post-date the period of significance of the Unison Battlefield Historic District (November 1-3, 1862) and are, therefore, considered non-contributing to the historic district. They do, however, contribute to the Unison Historic District [053-0692] that has a period of significance up to 1952.

The Individual Resource Information status reflects the period of significance for the Unison Battlefield Historic District (November 1-3, 1862), not the other historic district in which it is listed.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category:	Education
Resource Type:	School
NR Resource Type:	Building
Historic District Status:	Contributing
Date of Construction:	Ca 1890
Date Source:	Site Visit/Written Data
Historic Time Period:	Reconstruction and Growth (1866 - 1916)
Historic Context(s):	Architecture/Community Planning, Domestic, Education

Other ID Number: *No Data*
Architectural Style: *No Data*
Form: *No Data*
Number of Stories: 2.0
Condition: *No Data*
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

21164 Unison Road; Summergreen Farm; Unison School (53-692-9): ca. 1890; 2-story, frame (Masonite), cross-gable-roofed (standing-seam metal) building that was constructed as the Unison school. It features 1/1 windows, a formed and parged concrete foundation, overhanging eaves, a plain frieze board, an enclosed 3-bay hip-roofed front porch, and rear 5-bay porch. The school closed around 1915 and was then converted into a dwelling.

April 2010: The resource has not undergone major changes since the last survey.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	1/1
Roof	Gable	Metal	Standing Seam
Structural System and Exterior Treatment	Frame	Wood	*No Data*
Foundation	Solid/Continuous	Concrete	*No Data*
Porch	1-story, 3-bay	Wood	*No Data*

Secondary Resource Information

Secondary Resource #1

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 1970Ca
Date Source: Site Visit/Written Data
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning, Domestic, Education
Architectural Style: No Discernable Style
Form: *No Data*
Condition: Good
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Shed: Modern; 1-story, gable-end shed with T-1-11 siding and a corrugated metal roof (NC).

April 2010: The resource has not undergone major changes since the last survey.

Number of Stories: 1

Secondary Resource #2

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 1970Ca
Date Source: Site Visit/Written Data
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning, Domestic, Education
Architectural Style: No Discernable Style

Form: *No Data*
Condition: *No Data*
Threats to Resource: None Known
Cultural Affiliations: *No Data*
Cultural Affiliation Details:
No Data
Architectural Description:
Shed: Modern; 1-story, 3-bay shed with Masonite siding, and gable roof of asphalt shingle (NC).

April 2010: The resource has not undergone major changes since the last survey.
Number of Stories: 1

Historic District Information

Historic District Name: Unison Historic District/Unison Battlefield Historic District
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Rehabilitation Tax Credit

DHR ID: 053-0692-0009
Staff Name: DHR
Event Date: 8/9/2010
Staff Comment
No Data

Event Type: Rehabilitation Tax Credit

DHR ID: 053-0692-0009
Staff Name: Covington, Jane
Event Date: 8/9/2010
Staff Comment
No Data

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:
Architectural survey as part of the Unison Battlefield Historic District Nomination funded by the American Battlefield Protection Program Grant GA-2255-08-024. As per agreement with DHR, buildings were not resurveyed in the village of Unison as the last survey was fairly recent and the buildings have not dramatically changed.
Project Bibliographic Information:
Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Grant: Federal

Project Review File Number: *No Data*
Investigator: Unison Preservation Society
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 1/1/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:

American Battlefield Protection Program Grant GA-2255-08-024 awarded to the Unison Preservation Society.

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Kalbian, Maral
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 12/10/2001
Dhr Library Report Number: *No Data*
Project Staff/Notes:

No Data

Project Bibliographic Information:

Name: Lowe, David
Record Type: Book
Bibliographic Notes: Civil War in Loudoun Valley, The Battle of Unison, November 1-3, 1862. [National Park Service, 2008]. Project funded by the American Battlefield Protection Program Grant 2255-06-010.

Bibliographic Information

Bibliography:

No Data

Property Notes:

No Data

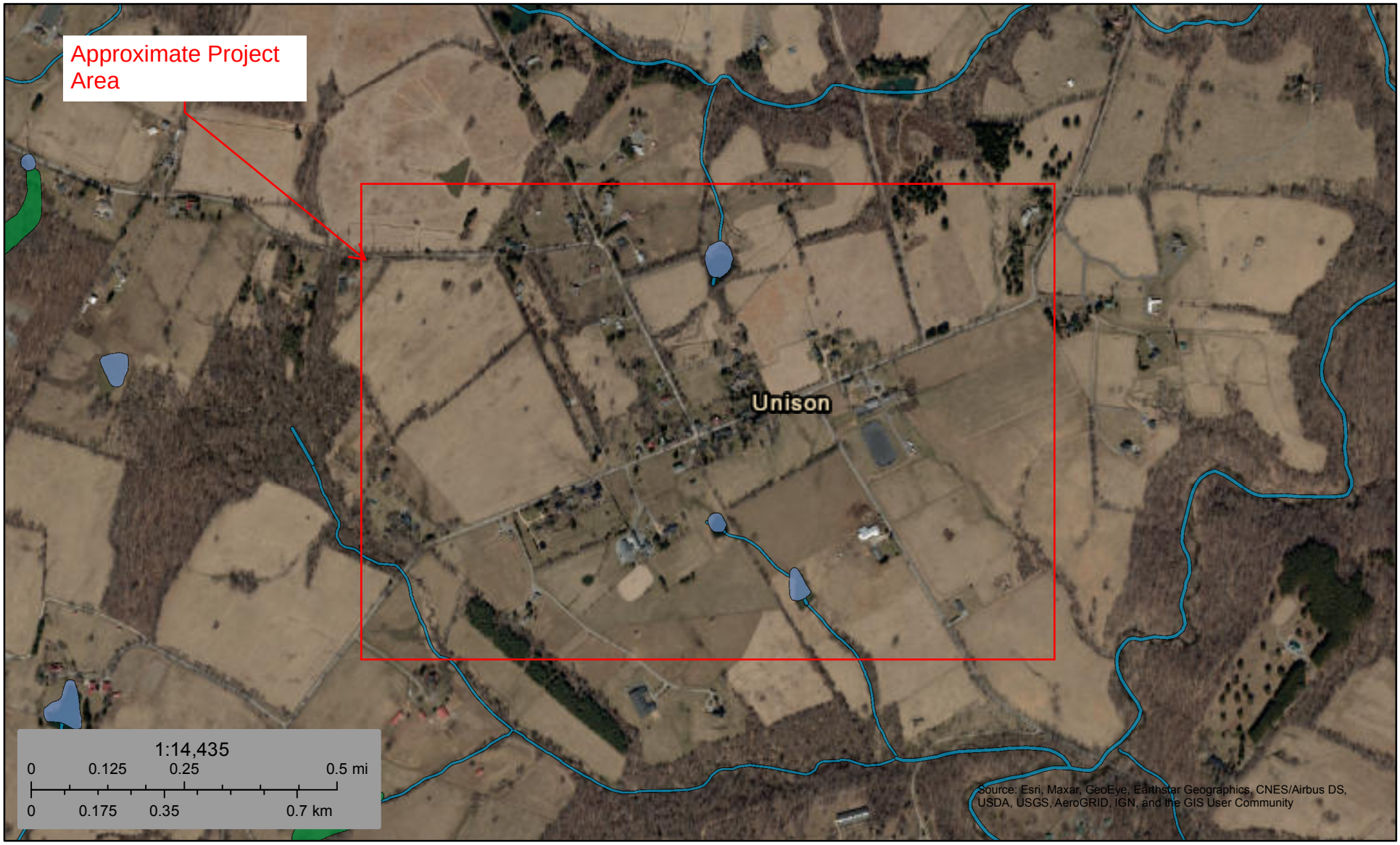
Appendix C

Wetlands, Streams, & Floodplain

Dewberry

U.S. Fish and Wildlife Service
National Wetlands Inventory

Unison NWI Map



December 2, 2021

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

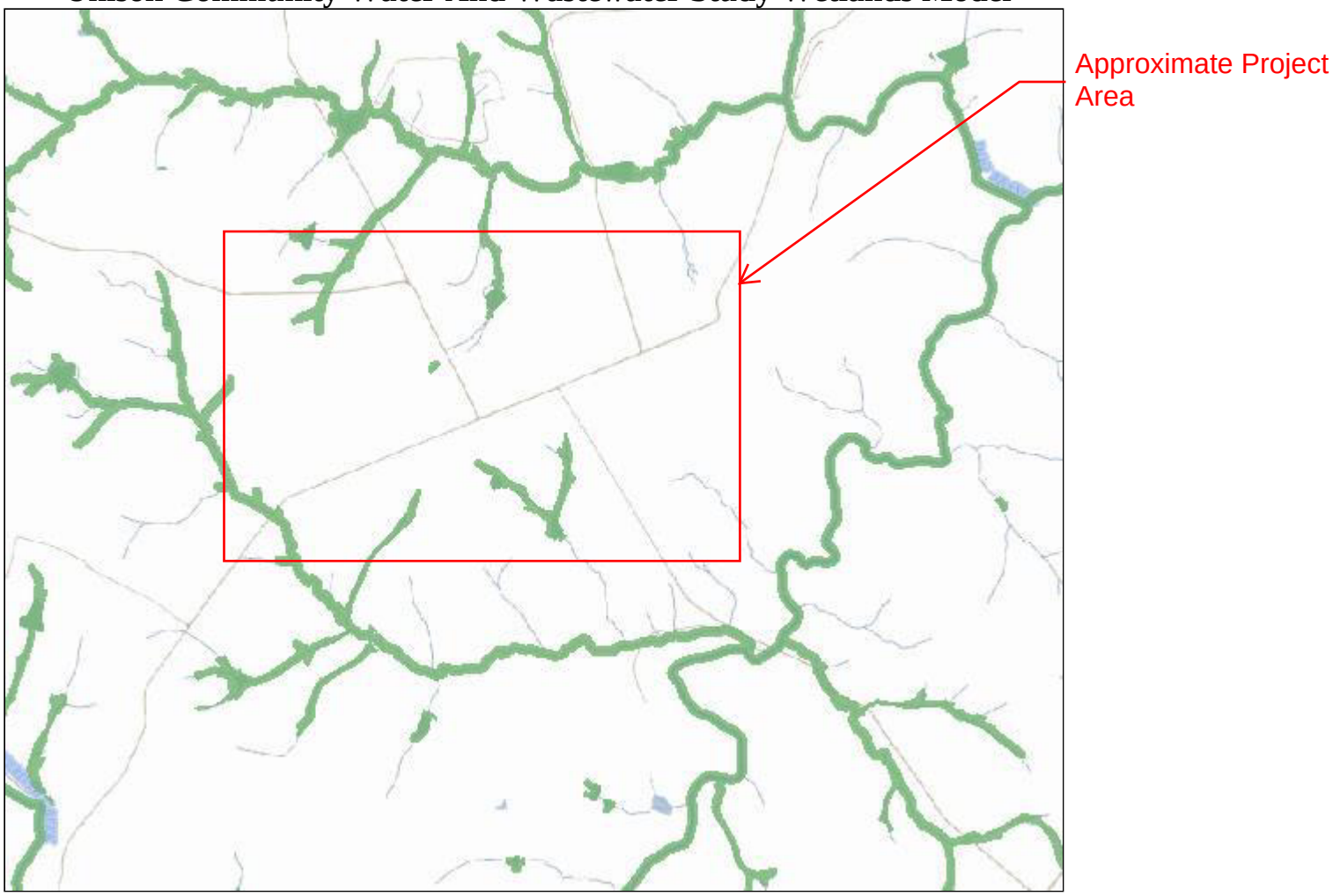
National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Thursday, December 2, 2021

Loudoun County, Virginia

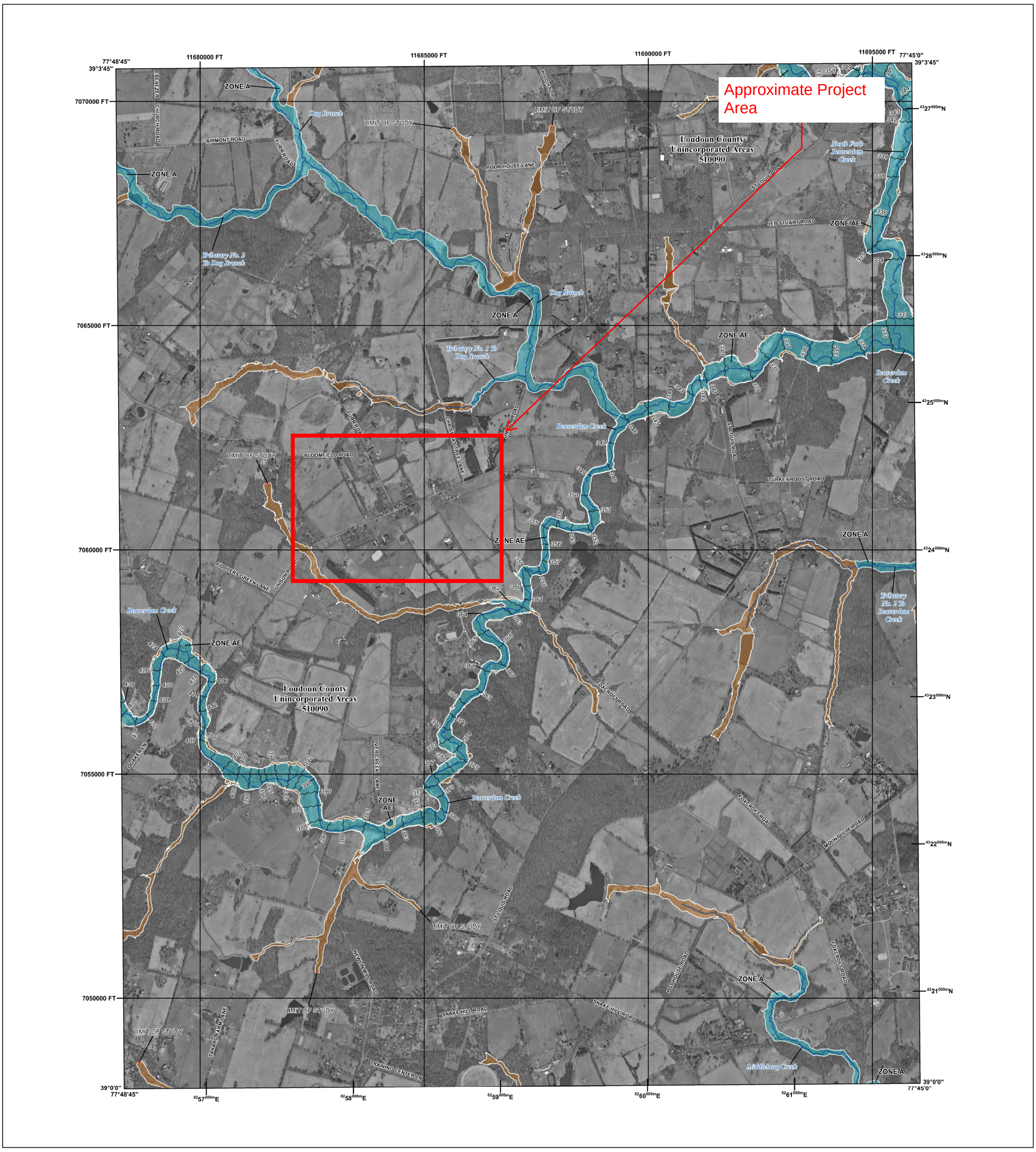
www.loudoun.gov

Unison Community Water And Wastewater Study Wetlands Model



Legend

Mapped Wetlands



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A, V, A99*
	With BFE or Depth *Zone AE, AO, AH, VE, AR*
	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
OTHER AREAS	NO SCREEN Areas of Minimal Flood Hazard *Zone X*
	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Accredited or Provisionally Accredited Levee, Dike, or Floodwall
	Non-accredited Levee, Dike, or Floodwall
OTHER FEATURES	E 18.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
	8 Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	513 Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction. To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by Loudoun County and was collected by Sanborn Map Company. This information was photogrammetrically compiled at a scale of 1:2,400 from aerial photography dated 2012.

SCALE

N

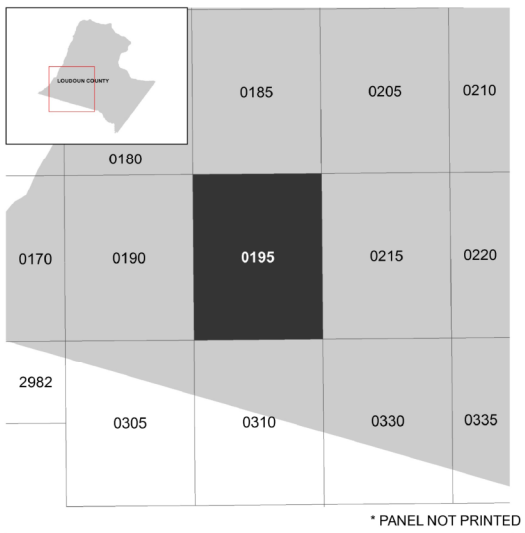
Map Projection:
NAD 1983 HARN StatePlane Virginia North FIPS 4501 Feet.
Western Hemisphere; Vertical Datum: NAVD88

1 inch = 1,000 feet 1:12,000

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

PANEL LOCATOR



* PANEL NOT PRINTED

FEMA
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

LOUDOUN COUNTY, VIRGINIA
And Incorporated Areas

PANEL 195 OF 2982

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
LOUDOUN COUNTY	510090	0195	E

VERSION NUMBER
2.3.3.2

MAP NUMBER
51107C0195E

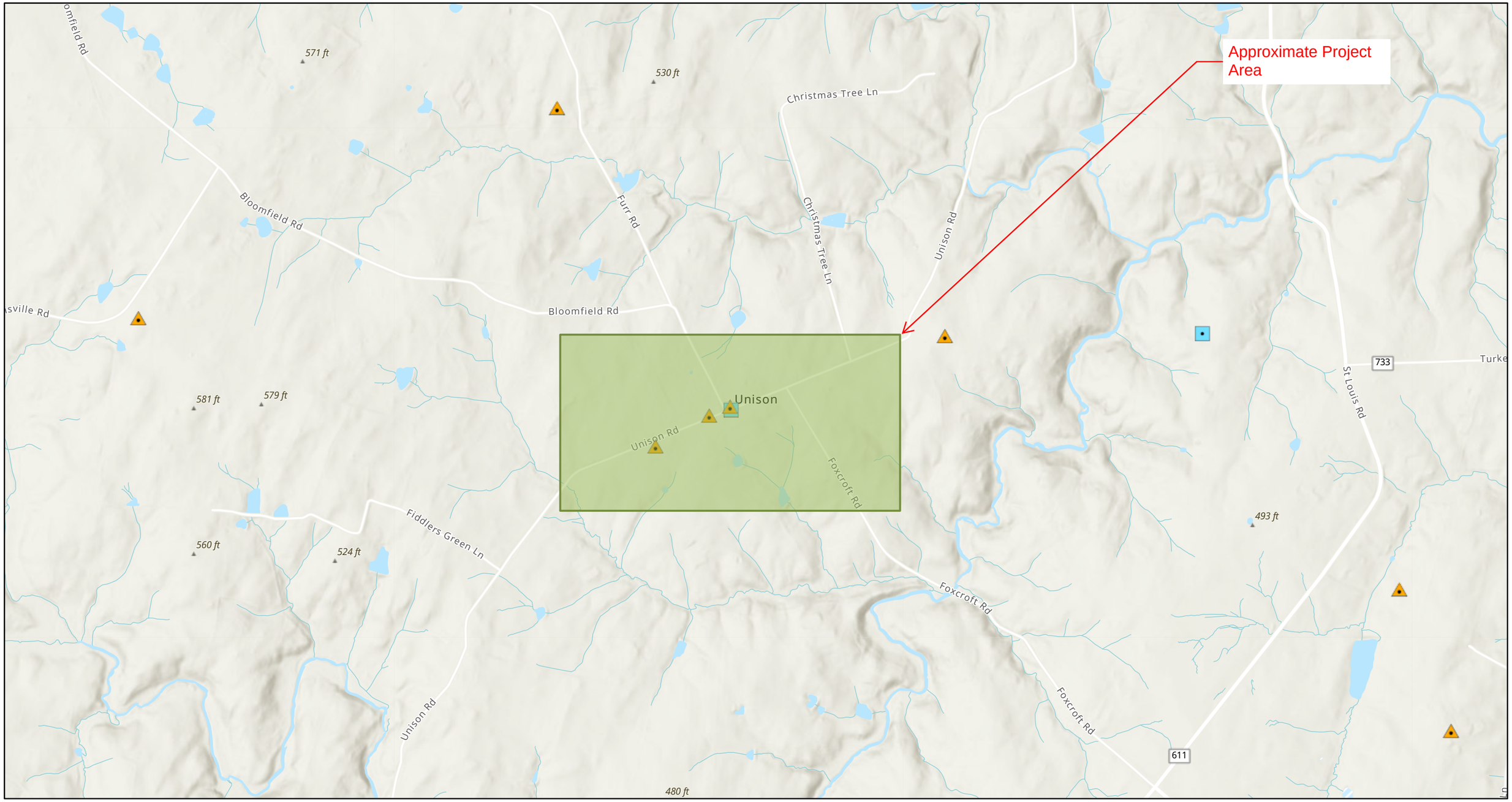
MAP REVISED
FEBRUARY 17, 2017

Appendix D

Hazardous Materials

Dewberry

Unison Community Water and Wastewater Study Hazardous Materials Map



12/2/2021, 1:21:59 PM

Override 1

Petroleum Releases (Daily)

- <Null>
- Closed
- Open

Registered Petroleum Tank Facilities (Daily)

- <Null>
- Not Active
- Active

VRP Site Addresses (Daily)

- Certificate Amendment
- Certificate Issued
- Enrolled in Program
- Potential Site
- Pre-VRP
- Terminated

Virginia County Boundaries

DEQ Offices (2020)

1:18,056

0 0.17 0.35 0.7 mi

0 0.28 0.55 1.1 km

Virginia Department of Environmental Quality, Esri, NASA, NGA, USGS, FEMA, This EPA Geospatial data set is generated from the following national environmental programs: Superfund National Priorities List (NPL) from the Superfund Enterprise Management

Provided by Virginia Department of Environmental Quality
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Appendix E

Project Soils Information

Dewberry

United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Loudoun County, Virginia

December 2, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

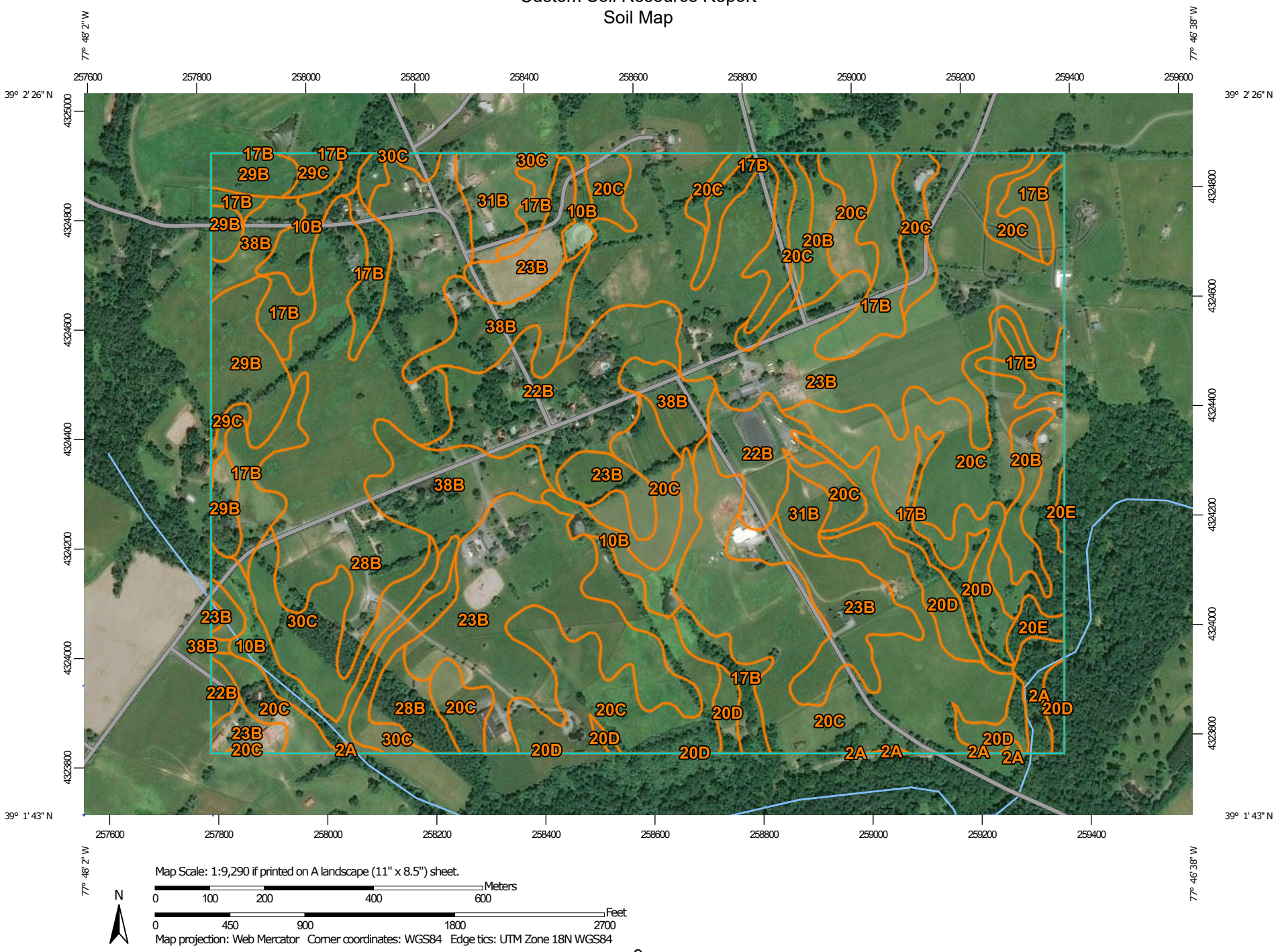
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:9,290 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Loudoun County, Virginia
Survey Area Data: Version 18, Sep 14, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 12, 2018—Jun 4, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2A	Codorus silt loam, 0 to 2 percent slopes, occasionally flooded	3.0	0.7%
10B	Mongle silt loam, 0 to 7 percent slopes, frequently flooded	16.6	3.9%
17B	Middleburg silt loam, 2 to 7 percent slopes	36.7	8.6%
20B	Purcellville and Tankerville soils, 2 to 7 percent slopes	6.8	1.6%
20C	Purcellville and Tankerville soils, 7 to 15 percent slopes	106.5	25.0%
20D	Purcellville and Tankerville soils, 15 to 25 percent slopes	12.7	3.0%
20E	Tankerville and Purcellville soils, 25 to 45 percent slopes	2.0	0.5%
22B	Purcellville-Swampoodle complex, 2 to 7 percent slopes	26.6	6.3%
23B	Purcellville silt loam, 2 to 7 percent slopes	101.7	23.9%
28B	Eubanks loam, 2 to 7 percent slopes	48.5	11.4%
29B	Eubanks loam, 2 to 7 percent slopes, stony	13.7	3.2%
29C	Eubanks loam, 7 to 15 percent slopes, stony	2.2	0.5%
30C	Tankerville and Philomont soils, 7 to 15 percent slopes	15.2	3.6%
31B	Philomont and Tankerville soils, 2 to 7 percent slopes	7.5	1.8%
38B	Swampoodle silt loam, 2 to 7 percent slopes, occasionally ponded	25.9	6.1%
Totals for Area of Interest		**425.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic

class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Loudoun County, Virginia

2A—Codorus silt loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: pk1y
Elevation: 200 to 790 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Codorus and similar soils: 75 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Codorus

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 50 inches: loam
H3 - 50 to 62 inches: stratified very gravelly sand to loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 10 to 24 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

Hatboro

Percent of map unit: 7 percent
Landform: Flood plains

Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

10B—Mongle silt loam, 0 to 7 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: pk25
Elevation: 230 to 950 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: Not prime farmland

Map Unit Composition

Mongle and similar soils: 85 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mongle

Setting

Landform: Drainageways
Landform position (three-dimensional): Mountainbase
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and metamorphic rock and/or colluvium derived from igneous and metamorphic rock

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 43 inches: silt loam
H3 - 43 to 61 inches: very gravelly clay loam

Properties and qualities

Slope: 0 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 10 to 24 inches
Frequency of flooding: FrequentNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D

Hydric soil rating: No

Minor Components

Hatboro

Percent of map unit: 4 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

17B—Middleburg silt loam, 2 to 7 percent slopes

Map Unit Setting

National map unit symbol: pk2d
Elevation: 180 to 1,160 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Middleburg and similar soils: 85 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Middleburg

Setting

Landform: Drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Mountainbase
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Local colluvium derived from igneous and metamorphic rock

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 48 inches: clay loam
H3 - 48 to 61 inches: silt loam

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Hatboro
Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

20B—Purcellville and Tankerville soils, 2 to 7 percent slopes

Map Unit Setting
National map unit symbol: pk2g
Elevation: 330 to 840 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Purcellville and similar soils: 46 percent
Tankerville and similar soils: 42 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Purcellville

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile
H1 - 0 to 9 inches: silty clay loam
H2 - 9 to 20 inches: silty clay loam
H3 - 20 to 34 inches: silt loam
H4 - 34 to 64 inches: silt loam

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Tankerville

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 30 inches: loam
H3 - 30 to 35 inches: gravelly loam
H4 - 35 to 40 inches: bedrock
H5 - 40 to 50 inches: bedrock

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock; 40 to 55 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

20C—Purcellville and Tankerville soils, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: pk2h
Elevation: 260 to 820 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Purcellville and similar soils: 46 percent
Tankerville and similar soils: 42 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Purcellville

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 9 inches: silty clay loam
H2 - 9 to 20 inches: silty clay loam
H3 - 20 to 34 inches: silt loam
H4 - 34 to 64 inches: silt loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Tankerville

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 30 inches: loam
H3 - 30 to 35 inches: gravelly loam
H4 - 35 to 40 inches: bedrock
H5 - 40 to 50 inches: bedrock

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock; 40 to 55 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

20D—Purcellville and Tankerville soils, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: pk2j
Elevation: 210 to 980 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Purcellville and similar soils: 46 percent
Tankerville and similar soils: 42 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Purcellville

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 9 inches: silty clay loam
H2 - 9 to 20 inches: silty clay loam
H3 - 20 to 34 inches: silt loam
H4 - 34 to 64 inches: silt loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Tankerville

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 30 inches: loam
H3 - 30 to 35 inches: gravelly loam
H4 - 35 to 40 inches: bedrock
H5 - 40 to 50 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock; 40 to 55 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

20E—Tankerville and Purcellville soils, 25 to 45 percent slopes

Map Unit Setting

National map unit symbol: pk2k
Elevation: 210 to 890 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: Not prime farmland

Map Unit Composition

Purcellville and similar soils: 46 percent
Tankerville and similar soils: 42 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Purcellville

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 9 inches: silty clay loam
H2 - 9 to 20 inches: silty clay loam
H3 - 20 to 34 inches: silt loam
H4 - 34 to 64 inches: silt loam

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Tankerville

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from granite and gneiss

Typical profile
H1 - 0 to 4 inches: loam
H2 - 4 to 30 inches: loam
H3 - 30 to 35 inches: gravelly loam
H4 - 35 to 40 inches: bedrock
H5 - 40 to 50 inches: bedrock

Properties and qualities
Slope: 25 to 45 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock; 40 to 55 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Hydric soil rating: No

22B—Purcellville-Swampoodle complex, 2 to 7 percent slopes

Map Unit Setting
National map unit symbol: pk2l
Elevation: 380 to 720 feet
Mean annual precipitation: 36 to 47 inches

Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Purcellville and similar soils: 50 percent
Swampoodle and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Purcellville

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 9 inches: silty clay loam
H2 - 9 to 20 inches: silty clay loam
H3 - 20 to 34 inches: silt loam
H4 - 34 to 64 inches: silt loam

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Swampoodle

Setting

Landform: Depressions
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Slope alluvium derived from granite and gneiss

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 24 inches: sandy loam
H3 - 24 to 37 inches: clay

H4 - 37 to 61 inches: loam

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 10 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: No

23B—Purcellville silt loam, 2 to 7 percent slopes

Map Unit Setting

National map unit symbol: pk2m
Elevation: 300 to 870 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Purcellville and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Purcellville

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 9 inches: silty clay loam
H2 - 9 to 20 inches: silty clay loam
H3 - 20 to 34 inches: silt loam
H4 - 34 to 64 inches: silt loam

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

28B—Eubanks loam, 2 to 7 percent slopes

Map Unit Setting

National map unit symbol: pk2s
Elevation: 340 to 900 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Eubanks and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eubanks

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 36 inches: sandy clay loam
H3 - 36 to 72 inches: sandy loam

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Hydric soil rating: No

29B—Eubanks loam, 2 to 7 percent slopes, stony

Map Unit Setting
National map unit symbol: pk2v
Elevation: 340 to 870 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Eubanks and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eubanks

Setting
Landform: Interfluves
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile
H1 - 0 to 8 inches: loam
H2 - 8 to 36 inches: sandy clay loam
H3 - 36 to 72 inches: sandy loam

Properties and qualities
Slope: 2 to 7 percent
Surface area covered with cobbles, stones or boulders: 0.1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Hydric soil rating: No

29C—Eubanks loam, 7 to 15 percent slopes, stony

Map Unit Setting
National map unit symbol: pk2w
Elevation: 340 to 930 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Eubanks and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eubanks

Setting
Landform: Interfluves
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile
H1 - 0 to 8 inches: loam
H2 - 8 to 36 inches: sandy clay loam
H3 - 36 to 72 inches: sandy loam

Properties and qualities
Slope: 7 to 15 percent
Surface area covered with cobbles, stones or boulders: 0.1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Hydric soil rating: No

30C—Tankerville and Philomont soils, 7 to 15 percent slopes

Map Unit Setting

National map unit symbol: pk2z
Elevation: 300 to 890 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Tankerville and similar soils: 44 percent
Philomont and similar soils: 43 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tankerville

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 30 inches: loam
H3 - 30 to 35 inches: gravelly loam
H4 - 35 to 40 inches: bedrock
H5 - 40 to 50 inches: bedrock

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock; 40 to 55 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B

Hydric soil rating: No

Description of Philomont

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 6 inches: gravelly sandy loam
H2 - 6 to 26 inches: gravelly sandy loam
H3 - 26 to 47 inches: sandy loam
H4 - 47 to 63 inches: gravelly loam

Properties and qualities

Slope: 7 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

31B—Philomont and Tankerville soils, 2 to 7 percent slopes

Map Unit Setting

National map unit symbol: pk32
Elevation: 340 to 890 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Philomont and similar soils: 44 percent
Tankerville and similar soils: 43 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Philomont

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 6 inches: gravelly sandy loam
H2 - 6 to 26 inches: gravelly sandy loam
H3 - 26 to 47 inches: sandy loam
H4 - 47 to 63 inches: gravelly loam

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Tankerville

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Residuum weathered from granite and gneiss

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 30 inches: loam
H3 - 30 to 35 inches: gravelly loam
H4 - 35 to 40 inches: bedrock
H5 - 40 to 50 inches: bedrock

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock; 40 to 55 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

38B—Swampoodle silt loam, 2 to 7 percent slopes, occasionally ponded

Map Unit Setting

National map unit symbol: pk35
Elevation: 380 to 820 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 43 to 66 degrees F
Frost-free period: 150 to 194 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Swampoodle and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swampoodle

Setting

Landform: Depressions
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Slope alluvium derived from granite and gneiss

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 24 inches: sandy loam
H3 - 24 to 37 inches: clay
H4 - 37 to 61 inches: loam

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 10 to 24 inches
Frequency of flooding: None

Frequency of ponding: Occasional
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: No

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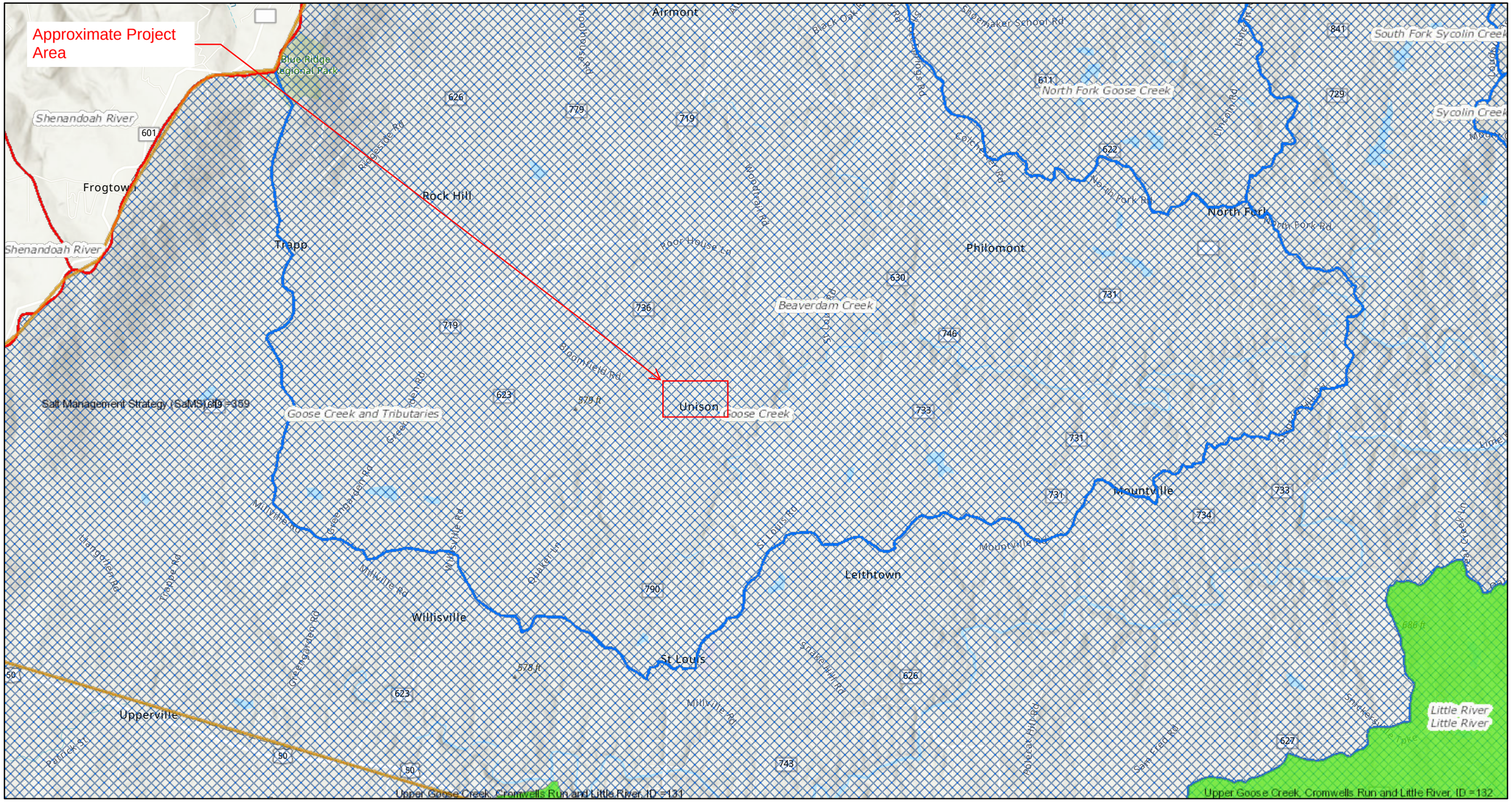
Appendix F

Impaired Waters

Dewberry

Unison Community Water and Wastewater Study Impaired Waters Map



12/2/2021, 2:20:29 PM

1:72,224

0 0.5 1 2 mi

0 1 2 4 km

Implementation Watersheds

- Eligible For 319(h) Funding
- Conditionally Eligible For 319(h) Funding
- Ineligible For 319(h) Funding
- IP In Progress

TMDL Watersheds

- Bacteria
- Sediment
- Toxics
- Nutrients
- Organic
- Other
- Virginia County Boundaries
- DEQ Offices (2020)

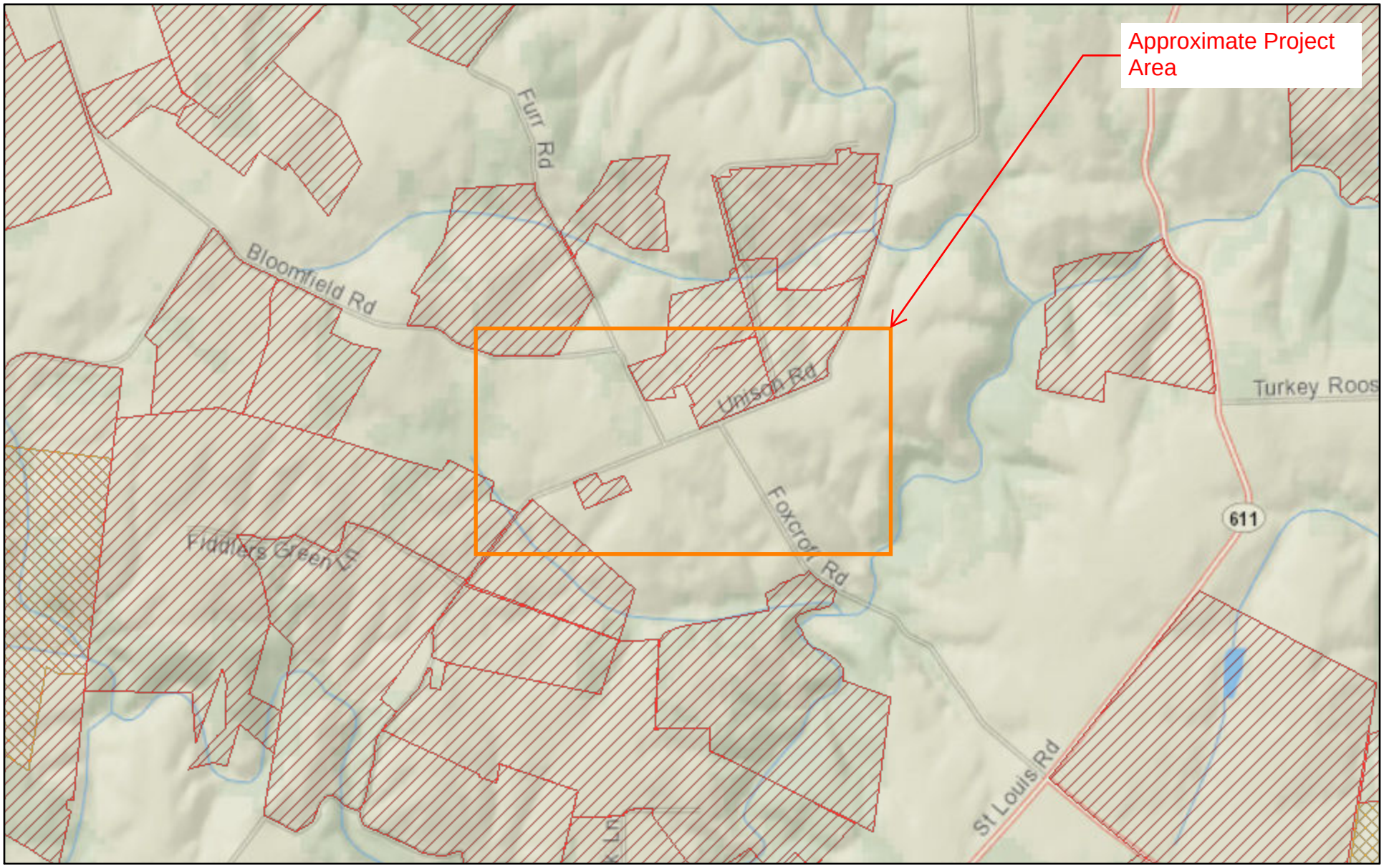
Virginia Department of Environmental Quality, Esri, NASA, NGA, USGS, FEMA, This EPA Geospatial data set is generated from the following national environmental programs: Superfund National Priorities List (NPL) from the Superfund Enterprise Management

Appendix G

Federal, State, and Local Lands

Dewberry

Unison Community Water and Wastewater Study - Federal, State, and Local Lands



December 2, 2021

Adjacent States
Managed Conservation Lands
Designation
Coheld Easement
Conservation Easement
Federal Lands
Local Lands
Non-Profit Lands
State Lands

1:29,191

0 0.17 0.35 0.7 mi

0 0.3 0.6 1.2 km

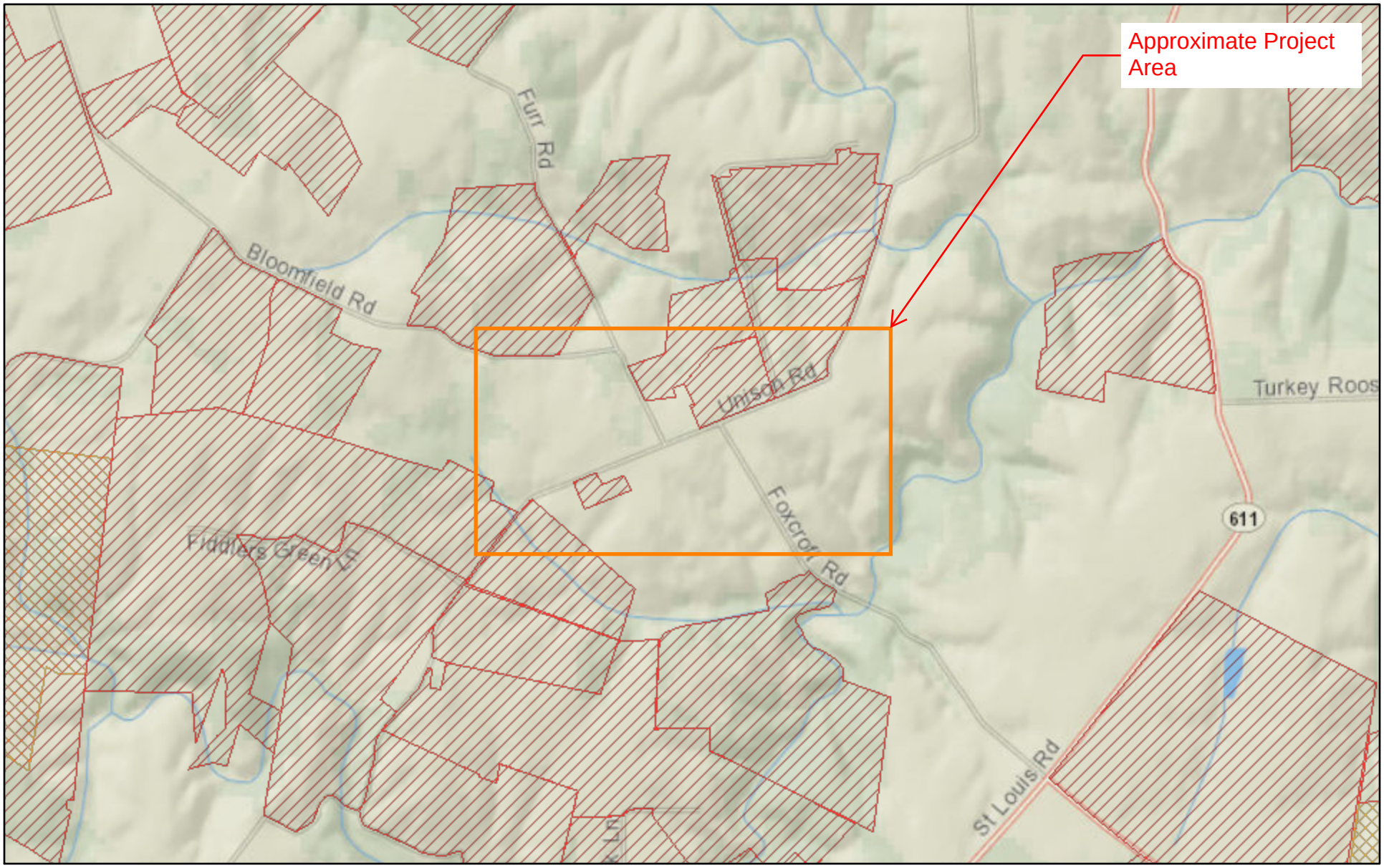
VDCR, VDOF, VDACS, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P

Appendix H

Virginia Outdoors Foundation Conservation Easements

Dewberry

Unison Community Water and Wastewater Study - Virginia Outdoors Foundation Conservation Easements



December 2, 2021

Adjacent States
Coheld Easement
Federal Lands
Non-Profit Lands
Managed Conservation Lands
Conservation Easement
Local Lands
State Lands
Designation

1:29,191

0 0.17 0.35 0.7 mi

0 0.3 0.6 1.2 km

VDCR, VDOF, VDACS, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P

Appendix I

Environmental Permit Register

Dewberry

PERMIT REGISTER

Agency	Permit Type	Regulatory Citation	Project Requirement	Action/Report/Application	Design Phase Necessary to Make a Determination of need or submittal	Agency Review
U.S. Army Corps of Engineers (USACE)	Jurisdictional Determination (JD) Section 404	33 U.S.C. §1344	Yes; to identify waters / wetlands and RPA's	Field Delineation/Wetland Delineation Report	Kick Off & Property Access approval	4-6 Weeks
U.S. Army Corps of Engineers (USACE)	Nationwide Permits (Nontidal Wetlands Section 404)	33 U. S. C. §1344	Yes; applicability determined on project impacts to WOUS/wetlands, Avoidance and Minimization justification required. **Wetland Mitigation Required at a 1:1 ratio for forested wetland conversion**.	Determine detailed impacts; narrative, and Joint Permit Application (JPA). Application filed jointly with the USACE, and VMRC	60%	45-60 Days
VA Department of Environmental Quality (DEQ)	Virginia Water Protection Permit (401 Water Quality Certificate)	9 VAC 25-260-10 9 VAC 25-210-10 et seq 9 VAC 25-680-10 et seq	Yes; applicability dependent on project impacts to WOUS/wetlands. Avoidance and Minimization justification required. **Wetland Mitigation Required at a 1:1 ratio for forested wetland conversion**	Determine detailed impacts; narrative, and Joint Permit Application (JPA). Application filed jointly with the USACE, and VMRC	60-90%	
VA Department of Environmental Quality (DEQ)	Air Quality Permit for Generator Emission (if pump station or treatment facility is proposed with project)	9 VAC 5-80-1100	Yes: depending on size of generator, below is exempted from a permit requirement by size, anything over will need a permit Diesel engines that have an aggregate brake horsepower of less than 1,675 horsepower (1,125 kilowatts). ****NOTE:** "Aggregate" means the sum or total brake horsepower (or kilowatts) for all generators included in the application.	File permit application if necessary, upon determination of size requirement & fuel type	60%-90%	3-4 months
VA Department of Environmental Quality (DEQ)	Certificate to Construct (CTC)	9 VAC 25-790-50 and 60	Yes: for Municipal Sewage Collection,	File application at least 30 days prior to construction	Plan Approval- Prior to Bid	
VA Department of Environmental Quality (DEQ)	Certificate to Operate (CTO)	9 VAC 25-790	Yes, if obtained a Certificate to Construct must obtain Certificate to Operate	File application at least 30 days prior to construction	Plan Approval -Prior to Operation	
Virginia Marine Resource Commission (VMRC)	Subaqueous Individual Permit to construct in Virginia Tidal Wetlands and Subaqueous bottoms.	Code of VA § 28.2-1200 through 28.2-1400	Yes; Stevens Mill Run has a 12.4 square mile drainage area and therefore falls within VMRC jurisdiction.	Direct or indirect impacts to streams with > 5 square miles of drainage are Determine detailed impacts; narrative, and Joint Permit Application (JPA). Application filed jointly with the USACE, and VMRC	60%-90%	3-4 Months
Virginia Department of Transportation	Land Use Permit for construction within State Right of Way.	24VAC30-151-300 & 400	Yes: necessary for each Roadway Crossing of I-95 and Route 207.	Pre application meeting recommended. Construction methods, lane closures and traffic management plan required.	90% plan	3-6 months
Virginia Department of Health	Plan Approval prior to County plan approval	Virginia and Caroline County Specifications and Standards.	Yes: If Utility Lines are in excess of 12 inches in diameter, there is elevated storage, or well and/or treatment.	Submittal Requirements detailed on Page 20 of Caroline County Site Plan Approval Packet	90-100% plan	
Virginia Department of Historic Resources - SHPO	All permits require compliance with Section 106 of the National Historic Preservation Act	Section 106 of the National Historic Preservation Act	Yes, as part of the Federal Action and State Permit issuance. May require Tribal coordination with Mattaponi and Pamunkey tribes	Early coordination with VDHR at 60% plan stage to assess the potential need for archaeological surveys.	60-90	3-6 months
Caroline County	Chesapeake Bay Preservation Area Site Assessment & Exemption Approval	9 VAC-10-20-070 Code of VA, Chesapeake Bay Preservation Act, Chapter 4 of the Caroline County	Yes: large portions of the project site are located within mapped RPA. A Water Quality Impact Assessment will likely be required. Dependent on final design	Site Plan Approval Process	90% (Submit at 100%)	60-90 Days

PERMIT REGISTER (Continued)						
Agency	**Permit Type**	**Regulatory Citation**	**Project Requirement**	**Action/Report/Application**	**Design Phase Necessary to Make a Determination of need or submittal**	**Agency Review**
Caroline County & DEQ	Erosion and Sediment Control & Stormwater Permit (DEQ/VSMP)	Caroline County E & S Control Ordinance & VESCH	E&S & Stormwater Management plans including RLD	VSMP Registration/SWPPP	100%	30-45 days
Caroline County	Caroline County Land Disturbance Permit application	County Code	Yes	Building/Zoning/Land Disturbance permit application	30%	30 Days
Caroline County	Graves, Memorials, Places of Burial and Historical Significance Certification	County Code	Engineer must Sign and Seal a certification as to whether these items exist on site	May require Phase I Archaeological survey along project alignment.		

Acronyms:

WOUS – Waters of the U. S.

RPA's – Resource Protection Areas

RLD Registered Land Disturber

VESCH – Virginia Erosion and Sedimentation Control Handbook

Appendix B

Unison Application

Loudoun County, Virginia
APPLICATION FOR CONSIDERATION OF COMMUNITY WATER AND/OR WASTEWATER SOLUTIONS

*****DISCLAIMER: Applying for assistance from the County for Water and/or Wastewater solutions does not guarantee that improvements will be provided. Applications aid the County in assessing which communities have the greatest need. *****

Background and Instructions

This application form provides a means for communities in Loudoun County to apply for water and/or wastewater service improvements. This application form collects some of the necessary information for consideration, evaluation, and prioritization of applications.

Applicants should fill in as much of the information as possible, including the Individual Homes Data Gathering Form and the Property Owner Signatures page. **An asterisk (*) is used where the information is required.** If unsure about a response, a question mark (?) should be added. Completed forms should be submitted to:

Department of General Services/Scott Fincham
County of Loudoun
801 Sycolin Road, SE
P.O. 7100
Leesburg, VA 20177-7100

For questions or assistance, Mr. Fincham may be contacted at 703-771-5520, or by email scott.fincham@loudoun.gov.

To be eligible to submit an application:

- There must be issues with water and/or wastewater within the community;
- The community must identify at least two coordinators and submit only one application per community;
- The application must contain the signatures of at least 60% of the total owners of occupied homes and other eligible structures within the community.
- A map of the community must be provided. The map may be hand-drawn or copied from another source. It must have sufficient detail and be of sufficient quality to show the community boundary and the properties that comprise the community.

Loudoun County, Virginia
APPLICATION FOR CONSIDERATION OF COMMUNITY WATER AND/OR WASTEWATER SOLUTIONS

Occupied and unoccupied residences, as well as other structures that traditionally have indoor plumbing, such as churches, businesses, and community centers, are eligible for consideration in this application. Structures that traditionally do not have indoor plumbing, such as garages, workshops, and barns; vacant non-residential structures; and properties without structures are not eligible for consideration. Upon receipt of this application form, Loudoun County representatives will conduct a review and evaluation of the application and provide an update to the community coordinators. Loudoun County will verify application information where possible and consider other available information beyond what is included in the application, including:

- Median lot size
- Soil characteristics
- Type of water / wastewater systems
- Number of homes and eligible structures without water or wastewater service
- Number of homes served by drinking water wells or systems not in compliance with current standards, including water quality, quantity or construction issues, or contamination
- Median age of water and wastewater disposal systems
- Number of failed or inadequate on-site wastewater disposal systems
- Number of alternative discharging wastewater systems
- Impaired streams

Scoring results, including materials used to conduct the scoring of an application, will be available to the community coordinators.

Line-by-line instructions:

1 – Provide the name or names by which the community is commonly referred. If the community does not have an existing name, please provide one like, “The cluster of homes around the intersection of …”

2 – Provide the street / road location of the community, such as, “At the intersection of 1st & Main Streets. Provide a map of the community which shows the community boundary and the properties that comprise the community.

3 – Provide a general description of the community, such as “20 homes, with one church.”

4 – Provide the name and contact information for the primary coordinator of this application process, a back-up coordinator, and optional third contact person.

5 – Check one or both of the choices; indicate whether this application is for assistance with solutions for water, wastewater, or both.

6 – Provide the residential population, number of persons living in the community, as accurately as possible.

7 – Indicate the number of homes in the community, including those currently occupied and those currently unoccupied.

8 – Indicate the number of eligible structures in the community, such as churches, businesses, community centers, and other buildings that typically have indoor plumbing.

9 – If the community has a civic association or home owners' association, indicate the name of the association, name of the contact person, and their contact information.

10 – Provide a narrative description of the water or wastewater issue in the community, such as "Of the 12 homes in our community, two have outhouses and six others have sewage coming up in their yards from their drainfields." This is an example only and will vary from community to community.

11 – Indicate the total number of homes and other eligible structures in the community with drinking water service and in which of the three general categories they fall under.

12 – Indicate the number of homes without any source of water anywhere on the property.

13 – Indicate the number of homes without running water inside the home.

14 – Indicate the total number of homes and other eligible structures in the community with wastewater service and in which of the five general categories they fall under.

15 – Indicate the number of homes without working indoor toilets that are currently using privies or outhouses.

16 – Indicate the number of owners of occupied homes and other eligible structures who have signed this application.

17 – Indicate the percentage of the total owners of occupied homes and other eligible structures who have signed this application.

BASIC INFORMATION

1. Community Name*: Unison, VA

2. Street/Road Location*: Unison Road and Bloomfield Road

3. Community Description*: A historic village in southwestern Loudoun County

COMMUNITY APPLICATION COORDINATOR CONTACT INFORMATION

4. Primary Coordinator Name (First and Last)*: Tara Connell

Address*: 20300 Woodtrail Road Round Hill, VA 20141

Phone*: 5714372157	E-mail: tjc20432@gmail.com	Fax:

Back-up Coordinator Name (First and Last): Harry Bigley

Address: 35008 Bloomfield Rd, Round Hill VA 20141

Phone:	E-mail: harrybigley@aol.com	Fax:

Optional Third Coordinator Name (First and Last): Steven Chase

Address: PO Box 2015, Middleburg, VA 20118

Phone: 5406870121	Email: incaroads@me.com	Fax:

ADDITIONAL INFORMATION

5. Service Requested*: Water ☑ Wastewater ☑ (Please check one or both)

6. Residential Population of Community*: approx 100

7. Number of Homes in the Community*: 32

8. Number of Other Eligible Structures in Use *: 6

9. Civic Association or Home Owners' Association Name, If Applicable:
none

Civic Association or HOA Contact Name (First and Last):

Address:

Phone:	Fax:	E-mail:

10. Narrative description of the water or wastewater issue in the community. Use additional paper if needed.)*:

The Unison village and surrounding countryside has been called "pristine" by historians and state and federal officials because this rural countryside in the foothills of the Blue Ridge Mountains has changed so little in the past 150 years. Settled by Quakers in the 1730s, Unison was one of the first five settlements in what is now Loudoun County and is one of the best preserved. It has no housing subdivisions or commercial development and most of its rural dirt roads, lined with stone walls and trees, are still intact, and is the site where Union and Confederate cavalry fought in the November,1862, Battle of Unison. The village of Unison is listed on the National Register of Historic Places.

Unison has historically had both water supply and poor soil for septic systems. The geology of the village is not optimal for a consistent supply of well water, and some residents must resort at times during the year to truck in water for non-potable needs. The area soil is also sub-par, resulting in many residents having to conduct costly maintenance on their drainfields or install alternative septic systems. These problems are significant and over time have caused Unison homeowners considerable expense, both in water and sewer issues and in home values, which are impacted negatively by these issues. A large majority of homeowners within the application boundary support the first phase of study on establishment of community water and sewer, an action we believe is warranted.

In the following section, please provide a numeric value for each of the questions.

11. Number of homes and other eligible structures in the community with drinking water service*:
Please indicate how many of those homes and other eligible structures are in the three categories shown below:

Individual Wells*: 32	Community Water System*: 0	Other*:

12. Number of homes without any source of water on the property*: 0

13. Number of homes without running water inside the home: 0

14. Number of homes and other eligible structures in the community with wastewater service (total)*: 0

Please indicate how many of those homes and other eligible structures are in the five categories shown below:

Individual Septic Tanks* 32	Community Wastewater System*: 0	Pump-and-Haul*: 0
Permitted Discharging Systems*: 0	Other*: 0	

15. Number of homes without working indoor toilets / currently using privies or outhouses*: 0

16. Number of owners of occupied homes and other eligible structures who have signed this application below*: 24

17. Percentage of owners of occupied homes and other eligible structures who have signed this application below*: 75

DATA GATHERING FORM FOR INDIVIDUAL HOMES AND OTHER ELIGIBLE STRUCTURES

Please provide the address, printed name, signature, date of signature, and any of the other information indicated if possible. See explanations below, and use additional sheets as needed.

Please provide the Loudoun County Property Identification Number (PIN), and the page number, where the property is recorded, if known: See http://logis.loudoun.gov/weblogis/	For the lot size please provide in approximate acres or portions of an acre (e.g., ¼ acre).
For the Current Water Source, please select from the following, and enter the appropriate number in the form: 1- Individual well working fine 2- Individual well with quality or quantity issues 3- Shared well working fine 4- Shared well with quality or quantity issues 5- Community water system working fine 6- Community water system with quality or quantity issues 7- No on-site source of water 8- Other 9- Don't know	For the Current Wastewater Service, please select from the following, and enter the appropriate number in the form: 1- Conventional septic system working fine 2- Conventional septic system with performance issues 3- Alternative onsite system working fine 4- Alternative onsite system with performance issues 5- Community wastewater treatment system working fine 6- Community wastewater treatment system with performance issues 7- Alternative onsite discharging system regardless of performance 8- Outhouse or portable toilet 9- Other 10- Don't know
Please provide the age of the water system currently in use (in years):	Please provide the age of the wastewater system currently in use (in years):

Please complete the Data Gathering Form for Individual Homes and Other Eligible Structures to the best of your ability. It is understood that in many cases property addresses, property owner signatures and the date of signature may be the only additional information that is provided.

Instructions for Page 4

By signing this form, I attest that I am the owner (or one of the owners) of the property indicated, that the information I have provided is the best available to my knowledge, and that I support this request for Loudoun County assistance with water and/or wastewater issues in my community and pledge my cooperation and assistance with this process.

For an application to be considered on behalf of a community, at least 60% of the total number of property owners within the community must sign this application. (Please attach additional sheets as needed).

Property address	Property Identification Number (PIN)	Owner (Please print and sign name)	Date Signed	Lot Size (acres)	Current Water Source / Age	Current Wastewater Service / Age
					/	/
					/	/
					/	/
					/	/
					/	/
					/	/
					/	/
					/	/
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Property address	Property Identification Number (PIN)	Owner (Please print and sign name)	Date Signed	Lot Size (acres)	Current Water Source / Age	Current Wastewater Service / Age
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					/	/

Appendix C

Health Department Research

Unison, Health Department Research – General Information

Parcel ID	Tax Map #	Primary Zoning	Owner	Address
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
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[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	[redacted]	AR2	[redacted]	[redacted]
[redacted]	No records available	AR2	[redacted]	—

Unison, Health Department Research – Septic System

Parcel ID	General System Type	Septic Regulator	Septic Year	Septic Age (2022)	Septic Location	Septic Tank Parameters (if applicable)	Septic Service History	Septic Repair	Additional Sewer Notes	Evidence of Past Sewer Problems?	Evidence of Current Sewer Problems?	Max Site Flow
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1987-0425-000	1987	35	July 28, 1987 letter: "the design and exact location of the septic-tank drainfield system is unknown"	Tank size: 1000 or 1100 gallons? (1000 most recently reported number) Tank construction material: Concrete Tank Depth below grade: 6" or 8"? (8" most recently reported number)	Pumping Report 5/13/2016 for work on 5/01/16 - said "Yes" for "Tank Condition Good," Butler and Eicher Septic Pumping Report 3/30/2017 for work on 06/03/16 - said "Yes" for "were repairs made to the tank or tank components?", comments: "lowered outlet line and tee," Stewarts Septic Service Pumping Report 7/07/2016 for work on 6/14/16 - said "Yes" for "were repairs made to the tank or tank components?", comments: "outlet line lowered and inspected by Loudoun County Health Department," Stewarts Septic Service Pumping Report 2/09/2018 for work on 6/16/17 - also cleaned effluent screen, said "Yes" for "Tank Condition Good," Stewarts Septic Service	2-20-01 Sewage Disposal System Construction Permit for repair, LCHD ID # 0241 MR 01, type I sewage disposal system, replace if necessary: inlet-outlet structure, distribution box, header lines, replaced: conveyance method (~3' section), distribution box (with 9 port box), header lines (with ~2' of each header), valid until 8-20-02 Sewage Disposal Permit #T60314380001 for "minor repair," date on permit 6-10-2016 permit active date 2016-06-16, construction purpose: repair, system type: drainfield, replace outlet tee & conveyance line, contractor Stewart's Septic, approved June 10, 2016, noted "box uncovered (3 lines)" LC noted: "Verbal permission given to replace outlet tee. Previous unlicensed repair of inlet tee resulting in no fall of tees. Pump the tank. Level d-box and remove scum. Replace conveyance line to d-box. Walked over and probed drainfield. No sewage observed on ground. 5-17-2016	6-25-87 LCHD form: wrote "No" in answer to "Has known history of malfunction of septic system?", wrote "Yes" in answer to "Has septic tank been pumped in the last five years?" and "Does all waste water (including laundry and sink wastes) from the house go into the septic tank?" July 28, 1987 letter: "at the time of my inspection, there was no indication of a malfunction. Due to the unknown construction and probable age of the system there is no guarantee it will not malfunction in the near future" 5-11-2016 schematic drawing: "Existing Drainfield Approximate location No Records 3 lines observed from D-box unknown length/depth construction" 5-17-2016 LC noted: "Note that drainfield is located next to driveway not across driveway in field as shown by LMIS (PSSD 1987-0425). Also, note PSSD 1989-0485 and WWIN 1989 are easement property and belong to neighbor. ebk, sjd 5/16/2016"	N note that had to repair septic (in 2001 and 2016), but no records indicate system malfunctioned	N	—
[redacted]	Conventional (Gravity)	PSSD-1989-0485-000 PSSD-89-0484	1989	33	5-17-2016 LC noted: "Also, note PSSD 1989-0485 and WWIN 1989 are easement property and belong to neighbor. ebk, sjd 5/16/2016" (this document in RME for parcel [redacted])	0485: Capacity 450, Length 100 (next to crossed out 50), Width 45, Depth 3, specifics "9 line split case for 72/1F", Construction permit 6-15-89: septic tank capacity 1000 gals, pump and pump station checked "Yes" and noted "If necessary" (then noted "not necessary"), distribution box "2 boxes with master box and baffle", 1350 square feet required, depth from ground surface to bottom of trench upper 20-22 lower 38-43?, aggregate size 1/2 - 1 1/2", trench bottom slope 2-4"/100', depth of aggregate 13", trench length 50', number of trenches 4 lines upper 5 lines lower, noted "cleanouts installed", drawing of repair area for drainfield after this document Pumping report 9/29/2014 & 10/22/2019: tank size 1250 gallons, tank material concrete, tank depth below grade 3-inches	Pumping Report 9/29/2014 for work on 8/28/2014 - said "Yes" for "Tank Condition Good," Great Falls Septic Service, compartment 1 scum accumulation 3-inches and sludge accumulation 5-inches Pumping Report 10/22/2019 for work on 10/17/2019 - said "Yes" for "Tank Condition Good," Great Falls Septic Service, compartment 1 scum accumulation 3-inches and sludge accumulation 3-inches	2/28/89, 3/28/89 applications for construction - sewage disposal/water supply: approved 3/29/89, wrote "replace + enlarge drainfield"	Sewage Disposal System Operation Permit HD ID #: 224 FS 89, completion statement 8-29-89 (244 FS 89?) 4/25/01 application for evaluation of existing water and/or sewage systems, said "never" for "date septic tank last pumped" and "none" for "describe any history of a malfunction of the sewage disposal system"	N note that replaced and enlarged drainfield in 1989? but no records indicate system malfunctioned	N	450 (GPD)

Unison, Health Department Research – Septic System

Parcel ID	General System Type	Septic Regulator	Septic Year	Septic Age (2022)	Septic Location	Septic Tank Parameters (if applicable)	Septic Service History	Septic Repair	Additional Sewer Notes	Evidence of Past Sewer Problems?	Evidence of Current Sewer Problems?	Max Site Flow
[redacted]	Pump and Haul	PSSD-1971-0190 - old PSSD-2014-0053	1971 2014	51 8	Abandoned? septic system southeast corner of property	Septic abandoned? 9/19/2014 report: tank size 1000 gallons, tank depth below grade 18", concrete Loudoun County Manifest Report (no date): tank size 1000 gallons, tank depth below grade 18", tank material concrete 7/12/2016 report: tank size 800 gallons, depth 18", concrete 8/31/2016 report: tank size 1000 gallons, depth 18", concrete 2/09/2018 report: tank size 750 gallons, depth 12", concrete 4/09/2019 report: tank size 750 gallons, tank depth below grade 12", concrete	Pumping Report 9/19/2014 for work on 9/18/2014 - SeptiClean Inc, compartment 1 scum 4" and sludge 4", said "YES" for "tank abandoned after pumping" Pumping Report 7/12/2016 for work on 7/11/2016 - SeptiClean Inc, said "YES" for "access risers installed to grade" Pumping Report 8/31/2016 for work on 8/31/2016 - SeptiClean Inc, said "YES" for "access risers installed to grade" Pumping Report 2/09/2018 for work on 3/13/2017 - SeptiClean Inc, said "YES" for "access risers installed to grade", said "YES" for "Tank Condition Good" Pumping Report 4/09/2019 for work on 4/09/2019 - said "Yes" for "Tank Condition Good," Stewarts Septic Service Loudoun County Manifest Report (no date): compartment 1 scum 4" and sludge 4", compartment 2 scum 4" and sludge 4"	No repairs made - not possible to fix the system, currently use a permanent pump and haul	5/4/70 application to install sewer system 5/5/70 permit to install septic tank and sewage disposal system, 4 lines 66 ft long, 2.5 feet wide,10-foot centers, one inch slope in 25 ft, no trees within 10 ft of drainfield, no driveway or parking over drainfield 10/7/70 record of sewer inspection approved by Loudoun County 3-10-71 inspection of sewer line, installed checked "yes", 9 inches from top of sewer line to top of septic tank, inlet "T" installed checked "yes", type of material CI, size 4 inches September 6, 1973 letter: "sanitarian's investigation of the above referenced property...already contains an existing dwelling with a septic tank drainfield system that at this time shows no apparent malfunction." another letter same date: "1. There is an existing house on the proposed lot which is 3 years old. 2. This house is served by an existing septic tank-drainfield system, Permit #F2557, which was inspected and approved in October 1970. This system showed no evidence of malfunction on August 30, 1973. There is adequate area on the proposed lot for repair of this system if necessary." PSSD-71-0190: capacity 270, length 66, width 40, depth 3, 4 lines, type SDS, contractor MeConnetd?, Status Q5 4/20/88 (proposed settlement date 5/10/88) application for evaluation of existing water and sewage disposal systems, for "approx age of septic system" wrote "16 yrs" Evaluation report (dated 5/11/88 for evaluation and 6/4/88 for review) wrote 1982 for "year system installed" document with #150-89 noted "septic system is satisfactory", but also wrote "6/28 - unsatisfactory w/s" 6/22/89 evaluation report (reviewed 7/10/89) wrote 1982 for "year system installed", also wrote in 91 for "recommended pumping septic tank in 1991 and at 3 to 5 year intervals thereafter" 8/9/2013 permit: checked existing septic tank drainfield system, checked "No" for increase waste load and "Yes" for "Extending sewer?" County of Loudoun Zoning / Environmental Health Building Clearance Evaluation Request 8/19/2013: denied with note "hydraulically failing existing drainfield" and under conditions/reasons wrote "must meet all required setback distances to well and sewage disposal systems...existing shed over drainfield; willow and river birch in drainfield area; silver maples possibly within restricted area" drawing noted 4' septic tank, distribution box, drainfield 10' from edge of property line 12/19/2013 email with pictures of current system 12/27/2013 email: "…are planning to come out next week to see if we can locate a site suitable for the installation of a "conventional" drainfield, and if we are fortunate enough to accomplish that the Health Department will issue a permit. If we are not able to find a site suitable for a "conventional" drainfield it will be necessary for the owner to contract with a licensed AOSE or Engineer to propose a site and an "alternative" treatment system for Health Department review. If the submission is found satisfy State and County requirements, that submission will become the basis on which a System Repair Permit will be issued will be issued by Health. We at the Health Department are note authorized to design alternative treatment systems in-house" 1/19/14 sewage disposal permit #T40377770002, checked "Abandon", wrote PSSD-1971-0190, drawing notes septic tank abandonment, drawing notes "existing septic tank to be abandoned. If removed, it must be disposed of properly", general permit comments "This permit is for the abandonment of the existing leaking septic tank." February 17, 2014 soil summary report, checked "Yes" for "Advanced secondary pretreatment required?" and checked "Site Approved" and wrote drainfield to be placed at 1" depth at site designated on permit 5/20/14 design form, estimated percolation rate 90 mpi, proposed drainfield drawing June 13, 2014 letter: "I regret to inform you that the certification letter submittal package for the above referenced lot, submitted May 22, 2014, is denied. Specifically, the application does not meet the requirements of the SHDR (See of 12VAC5-610-597, Table 4.2) since the proposed drainfield location does not meet the minimum horizontal separation distance of 100 feet to an existing Class IIIC private water supply well in the adjoining property. Additionally, the proposed drainfield does not meet Loudoun County Codified Ordinance 1066.12 & 14, as modified by County Policy IV-6 *Offset to Seasonal Water Table from Alternative Onsite Sewage Systems Producing Secondary Effluent*, which requires a vertical separation distance to seasonable groundwater table of 18 inches." July 16, 2014: LCHD form, application T40377770001, also wrote T40377770002, application for septic abandonment and pump and haul emergency, type of construction checked existing single family dwelling, checked no for increase waste load and extending sewer, checked repair and septic tank drainfield system and wrote "failed sys.", wrote number of bedrooms 2, drawing shows "new 1500 P&H tank to replace old tank" and proposed drainfield and proposed building and driveway 9/22/2014 completion statement: "I hereby certify that the onsite sewage disposal system has been installed and completed in accordance with the construction permit issued (date) 8/06/2014 and is in compliance with Part D of the Sewage Handling and Disposal Regulations and when appropriate the plans and specifications for the project" T40377770002 No date provided: Drawing of pump and haul tank on 21096 Unison Rd? When look up that address on google maps shows it in parcel with[redacted] No date provided: Loudoun County Manifest Report, circled "No" for Tank condition Good, Baffles in good condition, and Effluent Screen Cleaned 10/13/14, LCHD application for permanent P&H, 0.93 acres, residential 2 bedrooms, noted "existing septic system failed, no other alternatives exist at this time" 1/13/15: "...own the residence located at 21092 Unison Road. The structure currently has an approved emergency pump and haul system (T4037770001) issued on August 5, 2014 and installed to correct an existing failing drainfield (now abandoned and decommissioned). No viable on-site repair options exists at this time. Numerous well across Unison Road would have to be abandoned, if allowed by the various landowners, to obtain suitable area for an alternative system to be permitted and installed. No other option for sewage disposal could be determined other than permanent pump and haul to serve the structure. Sewer is not available in the Village of Unison. The delegation of approval authority for certain permanent pump and haul applications was granted to the County Administrator at the Board of Supervisors meeting help on September 8, 2010. ISSUES: 1. Health Department Practice: The LCHD has historically recommended approval of permanent pump and haul applications only for existing occupied structures that have failing or substandard sewage disposal systems. This request meets the practice. 2. Comprehensive Plan Policy: In the Revised General Plan amended in April 2004, policies regarding pump and haul in the Rural Policy Area specify that pump and haul operations are permitted only as a last resort and a temporary method to address a proven public health emergency...The proposed meets both the practice and the policy listed previously." 1/13/15 document: "the applicant/owner is required to connect to public sewer when it becomes available and is within 300 feet of the property" Date Approved: 2/9/15, wrote "conversion to permanent P + H" and "previously installed P + H tank administrative conversion to permanent", T40424420001 contractual agreement with VDH, responsible for costs associated with operation and for insuring the P&H provider submits all required reports 8/8/19 P&H field inspection report, condition of the manhole and cover good, condition of the ground surface around the tanks OK, tank effluent level recently pumped, any signs of overflow or obvious wetness No, alarm working - could not check. yes, inspect property for any signs of discharges etc No issues, pumping company and latest receipt: Stewart's Septic Service, 04-09-2019, they are licensed and bonded, the current owner is the permitted owner	Y - building clearance dated 8/19/2013 denied with electronic note "hydraulically failing existing drainfield" 12/27/2013 email: "...are planning to come out next week to see if we can locate a site suitable for the installation of a "conventional" drainfield, and if we are fortunate enough to accomplish that the Health Department will issue a permit. If we are not able to find a site suitable for a "conventional" drainfield it will be necessary for the owner to contract with a licensed AOSE or Engineer to propose a site and an "alternative" treatment system for Health Department review. If the submission is found satisfy State and County requirements, that submission will become the basis on which a System Repair Permit will be issued will be issued by Health. We at the Health Department are note authorized to design alternative treatment systems in-house" Loudoun County Manifest Report (no date provided), circled "No" for Tank condition Good, Baffles in good condition, and Effluent Screen Cleaned 1/19/14 sewage disposal permit #T40377770002, general permit comments "This permit is for the abandonment of the existing leaking septic tank." 10/13/14, LCHD application for permanent P&H noted "existing septic system failed, no other alternatives exist at this time" 1/13/15: "...own the residence located at 21092 Unison Road. The structure currently has an approved emergency pump and haul system (T4037770001) issued on August 5, 2014 and installed to correct an existing failing drainfield (now abandoned and decommissioned). No viable on-site repair options exists at this time. Numerous well across Unison Road would have to be abandoned, if allowed by the various landowners, to obtain suitable area for an alternative system to be permitted and installed. No other option for sewage disposal could be determined other than permanent pump and haul to serve the structure. Sewer is not available in the Village of Unison. The delegation of approval authority for certain permanent pump and haul applications was granted to the County Administrator at the Board of Supervisors meeting help on September 8, 2010. ISSUES: 1. Health Department Practice: The LCHD has historically recommended approval of permanent pump and haul applications only for existing occupied structures that have failing or substandard sewage disposal systems. This request meets the practice. 2. Comprehensive Plan Policy: In the Revised General Plan amended in April 2004, policies regarding pump and haul in the Rural Policy Area specify that pump and haul operations are permitted only as a last resort and a temporary method to address a proven public health emergency...The proposed meets both the practice and the policy listed previously."	N - but have P&H	—

Unison, Health Department Research – Septic System

Parcel ID	General System Type	Septic Regulator	Septic Year	Septic Age (2022)	Septic Location	Septic Tank Parameters (if applicable)	Septic Service History	Septic Repair	Additional Sewer Notes	Evidence of Past Sewer Problems?	Evidence of Current Sewer Problems?	Max Site Flow
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1982-0171-000	1982	40	Drainfield south side of lot, 10' buffer on east and west side from property lines, distribution box 100' south from well, septic tank 50' southeast from well	9/11/81: Permit to install sewage disposal system, septic tank 1000 gal liquid capacity, noted "this is in reissue of WDU124F77 for an existing dwelling", case no 497F81 8/3/82 sewer inspection: "Allotted area adequate" checked "Yes" (10 ft from nearest lot line, 100 ft from water supplies, 10+ ft from trees, 10 ft from buildings), "watertight and equal surcharge to each line by water test" checked "Yes", distribution box provided with 5 extra outlets for future use, total area in bottom of ditches 1008 sq ft, number of ditches 4, length of ditches 84 ft, grade minimum 3 in per 100 ft, depth of aggregate under tile 6 in, total depth of agg 13 in, depth of backfill over agg 32 in, septic tank constructed of concrete (inside dimensions length 8-ft, width 4-ft, liquid depth 4-ft, depth of air space 12-in), checked "Yes" for "inside fittings comply with requirements" Capacity 400, length 84, width 36, depth 4 Pumping reports: tank size 1000 gallons, tank material concrete, tank depth below grade 12-inches (8/4/2021 report, changed from 19-inches on other two reports)	Pumping Report 6/21/2014 for work on 5/23/2014 - said "Yes" for "Tank Condition Good," Loudoun Septic Tank Service, compartment 1 scum accumulation 5-inches and sludge accumulation 14-inches Pumping Report 5/05/2020 for work on 5/07/2020 - said "Yes" for "Tank Condition Good," Loudoun Septic Tank Service, compartment 1 scum accumulation 8-inches and sludge accumulation 10-inches Pumping Report 8/04/2021 for work on 7/26/2021 - said "Yes" for "Tank Condition Good," Loudoun Septic Tank Service, compartment 1 scum accumulation 1-inches and sludge accumulation 24-inches	7/21/21: application for septic repair 7-27-21: LC component repair/replacements permit (CR), permit to replace distribution box, noted "Broken-Replace", noted "replace as needed" next to gravity, LCHD noted "corrugated conveyance line - contractor covered? and appears satisfactory", "surface of drainfield area appears satisfactory", "according to contractor, septic tank water tight with PVC tees + PVC out of tank to corrugated conv." 7-29-21: completion statement from Shenandoah Septic Inc (LCHD: T10395510001), "I herby certify that the onsite sewage disposal system has been installed and completed in accordance with the construction permit issued 7-27-21..."	3/11/77: general application for construction, septic tank 28 March 77: permit to install septic, drawing noted "old privy (to be removed)" April 21, 1978: renewal application, checked septic tank drainfield system 8/25/81: general application (497-81) for construction proposed septic tank drainfield system 6/12/2021 septic and well application check list, checked all except directions indicated, site address indicated, name of subdivision (if applicable), PIN # indicated and soils work provided	N - note that had to repair septic end of July 2021	N	—
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1976-0240-000PSSD-1985-0275	19761985	4637	~506 ft SE from the house~120 ft north from the house	—	—	—	9/16/1975 general application for construction checked proposed septic tank drainfield system 10/22/75 permit to install sewage disposal system2/18/76 PSSD-76-0240 capacity 600 length 92 width 80 depth 2.5, 8 lines 2/18/76: Record of inspection-sewage disposal system, checked "yes" for allotted area adequate, watertight and equal surcharge to each line by water test, inside fittings comply with requirements, installed according to permit design and storm drains from house and basement flowing away from subsurface drainage field, checked "no" for are there soil conditions now evident which indicate system may be unsatisfactory as designed, was surface drainage required and are follow-up inspections necessary. Ground water table not required. house sewer line material CI, septic tank constructed of concrete length 10' width 4' 10" liquid depth 4'8" depth of air space 15", drainfield area 1464 sq ft number of ditches 8 length of ditches 92 ft grade min 3"/100' max 5.5"/100' B stone used depth of aggregate 6" under tile total depth 13" backfill over aggregate 18-36", distribution box with 9 outlets undated document: "a newly constructed horse shower draw pipe is located running through the center of D/F" 4" corrugated black plastic 10" depth, "recommended to contractor & owner the relocation of horse shower drain" 6/13/84 application for construction - sewage disposal/water supply, proposed septic tank drainfield system 7/22/85 application for construction - sewage disposal/water supply, proposed septic tank drainfield system 8/8/85 soil evaluation form, site approved: drainfield to be placed at 19-21" depth at site designated on permit 10/15/85 drawing for sewage disposal system construction permit, shows location of house drainfield, this permit for another drainfield at top right of property (looking at aerial with north up, when looking at view from walking onto the driveway from the entrance, the drainfield is to the right of where the driveway splits into two), septic tank by barn, noted "1) cleanouts to be installed every 90' on line form tank to box", "2) portions of line going under road must be sleeved in cast iron", "3) line from tank to box must be a minimum of 35' from abandoned dug well" 12/6/85 sewage disposal system construction permit, new, type 1, 150 gpd/bedroom, septic tank capacity crossed out 300 gals wrote 750? 250? gals minimum, precast concrete distribution box with 5 ports - 1 in and 4 out, absorption trenches sq ft req 544 depth from ground surface to bottom of trench 19-21" aggregate size 1/2 - 1-1/2" trench bottom slope 2-4"/100' center to center spacing 10' trench width 2' depth of aggregate 13" trench length 80' number of trenches 4, pump & pump station: checked "no" for satisfactory said "please contact Loudoun County Health Department", checked "yes" for satisfactory for pretreatment unit, inlet-outlet structure, conveyance method, distribution box, header lines, and absorption trenches PSSD-85-0275, capacity 150, length 80, width 40, depth 1.5, 4 lines4/8/93 sewage disposal system operation permit 477FS85, design capacity of 150 gpd/bedroom, type 1	N	N	—

Unison, Health Department Research – Septic System

Parcel ID	General System Type	Septic Regulator	Septic Year	Septic Age (2022)	Septic Location	Septic Tank Parameters (if applicable)	Septic Service History	Septic Repair	Additional Sewer Notes	Evidence of Past Sewer Problems?	Evidence of Current Sewer Problems?	Max Site Flow
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1956-0138-000	1954	68	~36 ft east from the house	1/6/56 - tank capacity 750 gallons, dimensions: 7ft by 8.5 ft with depth of 5 ftsubsurface drainage - 2 ditches (total length 150 ft, width of 2 ft), total drainage is 300 sq ft.	5/15/1991 - Loudon County dept of public health deems present drainfield as unsuitable for future use. The only option currently available is to make a new drainfield.	1990 - superficial repairs were made to the system which did not seem to remedy the problem5/3/91 - "some regular folks thought a low spot in the drainfield area could be filled and alleviate the problem…related to them that this would probably NOT help the problem but we would see. in the meantime begin correspondence with owner of adjacent property lot to seek easement"4/10/92 - 12/92 - working on finding suitable land for drainfield repair	12/29/92 - permit obtained to install and maintain 4" sanitary sewer line in 6" pvc sleeve from R/W line to R/W line (crossing Route 630)7/9/93 - drainfield installed on neighboring property	Y1989 - first sewage disposal system malfunction5/15/1991 - "a site visit on April 2, 1991 revealed a malfunction of the sewage disposal system installed in 1954."2/24/92 Record of complaint- "sewage on ground and rev. house beside church". Complaint also says "this property has a history of problems with sewage disposal system". From a letter to the church from County of Loudon about the 2/24/92 complaint - "effluent was observed from the drainfield system ponding on the ground surface"; "All attempts to modify and/or repair the existing drainfield have failed".12/9/92 - update to complaint says sewage is STILL on the ground	N	—
[redacted]	Conventional (Septic with Gravity)	PSSD-1954-0108-000	1954	68	~141 ft from route 630, close to NE property line	6/10/54 new installation - 750 gallon capacity, 7ft length, 3.5 ft width, 5 ft depth. 3 ditches (total length 300 ft, width 1.3 ft), total drainage area 500 sq ft	9/13/93 - sewage disposal system construction permit - septic tank capacity 1500 gals (dual tanks required), 2400 sq ft of absorption trenches required Pumping: 5/25/16 - Stewarts Septic Service	8/24/89 - recommends replaced outlet tee with plastic, effluent line with plastic, replace distribution box, replace "header" lines with plastic, snake and flush lines to unplug accumulation of solids, place fill over malfunction area the length of the line. notes "the church understands that these repairs may not permanently solve the problem. but coupled with water saving fixtures, water conservation practices and plumbing leak maintenance perhaps the adsorption can function for a few more years"	—	N	N	450 (GPD)
[redacted]	Alternative Dispersal	PSSD-1954-0108 SSD-1994-0097-000	1994 1954	28 68	~141 ft from route 630, close to NE property line	—	OSS Inspection (historic): 4/14/11 - Morgan A KASH Ltd OSS Inspection-Partial (Routine): 8/24/12, 7/29/15,8/15/15, 7/30/16 - Morgan A KASH Ltd, 8/15/15, 7/30/16, 7/19/17, 7/11/18, 4/16/19, 5/11/20 - Catoctin Environmental OSS Inspection (Routine): 8/29/13, 6/23/14, 7/30/16 - Morgan A KASH Ltd OSS Inspection-Partial (Regulator): 8/18/15 - Loudoun County Health Department (LCHD) OSS Inspection (Routine): 2/16/21 - Eco Virginia	—	SSD-1994-0097-000 - not sure what this is, not in GIS	N	N	1000 (GPD)
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1975-0178-000 PSSD-2013-0318-000	1975 2013	47 9	northeast side rt. 736- unison	-- conv. Pump to trenches 1 bedrooms/150 GPD; pump and pump station -- concrete material, size 1000 gal, 2ft below ground surface. Percolation lines -- gravel trenches, also absorption trenches at the "proper depth". Distance between septic tank and well is 257ft, distance between absorption area and well is 192ft. Sewer line is schedule 40 PVC 4in. Percolation lines: installation depth-18-20inches, aggregate depth: 13 inches, 5 laterals at 50ft length and 26inches width	Pumping: 3/03/15, 5/26/17, 11/10/18, 11/22/19, 2/10/20, 1/06/21 - Powell's Plumbing Inc, 3/05/21 Loudoun Septic Tank	—	10/10/13 - construction on their property, including new bathroom that requires septic work notes: "one active drainfield on the site with few public records, believed to be installed around 1970 that serves three bedrooms in the house"	5/23/80 - record of complaint states "commodes overflowing - sewage on ground and bad odor". Investigation showed the sewer line from the house to the septic tank was crushed, causing stools to overflow when flushed. Also stated the possibility of contaminated water because the water and sewer line may be less than 35 ft apa	N	—

Unison, Health Department Research – Septic System

Parcel ID	General System Type	Septic Regulator	Septic Year	Septic Age (2022)	Septic Location	Septic Tank Parameters (if applicable)	Septic Service History	Septic Repair	Additional Sewer Notes	Evidence of Past Sewer Problems?	Evidence of Current Sewer Problems?	Max Site Flow
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1961-0175-000 PSSD-1968-0174-000	1968	54	~220 ft NE from the house	4/24/68 Record of sewage inspection - concrete septic tank, length 8 ft, width 4 ft, liquid depth 4 ft, depth of air space 12 inches. Drainfield - 1000 sq ft total area in bottom of ditches, 5 ditches each 100 ft long, grade is 2.25 inches/100 ft, broken stone aggregate used, depth of aggregate under Tile is 6 inches, total depth of aggregate is 13 inches, depth of backfill over aggregate is 18-24 inches	—	7/9/2020 repair or replace distribution box, and header lines	10/14/97 - two suitable drainfield sites found to add to the property and replace existing drainfield	N	N	—
[redacted]	Alternative Pretreat and Dispersal	PSSD-2012-0016-000 PSSD-1962-0162	2012 1962	10 60	northwest side of property center of the property	PSSD-1962-0162	Sampling: 12/03/12 - Powell's Plumbing Inc OSS Inspection (Routine): 5/21/13, 4/21/14 (deficient) - Powell's Plumbing Inc Pumping: 4/30/14 (deficient)- Powell's Plumbing Inc OSS Inspection-Partial (Follow Up): 5/03/14 - Powell's Plumbing Inc OSS Inspection (Routine): 5/27/15 (deficient) - Powell's Plumbing Inc OSS Inspection-Partial (Follow up): 7/14/15 - Powell's Plumbing Inc OSS Inspection-Partial (Complaint): 10/16/15 (deficient) - Powell's Plumbing Inc OSS Inspection-Partial (Follow up): 11/09/15 - Powell's Plumbing Inc OSS Inspection (Routine): 4/19/16 (deficient) - Powell's Plumbing Inc Pumping: 4/22/16 (deficient) - Powell's Plumbing Inc OSS Inspection-Partial (follow up): 4/26/19 - Powell's Plumbing Inc Sampling: 3/27/17 - Powell's Plumbing Inc OSS Inspection (Routine): 3/27/17 - Powell's Plumbing Inc OSS Inspection-Partial (Regulator): 4/19/17 - LCHD Pumping: 4/04/18 - Stewarts Septic Service OSS Inspection (Routine): 4/10/18 - Powell's Plumbing Inc OSS Inspection-Partial (Intermittent): 11/02/18 - Powell's Plumbing Inc OSS Inspection (Routine): 6/20/19 - Powell's Plumbing Inc OSS Inspection-Partial (Follow up): 7/08/19 - Powell's Plumbing Inc OSS Inspection (Routine): 6/24/20, 7/19/21 - Powell's Plumbing Inc	2/8/12 septic repairs necessary include: turn existing system into an emergency pump and haul, divert all roof drains away from newly proposed drainfield, abandon existing dug well	—	1/27/12 application for repairs on septic. "possible failing drainfield" 2/8/12 update: "sewage observed surfacing on the ground. After probing the ditches, they appeared to be saturated all the way to the ends of each ditch. A new drainfield is required to alleviate the health hazard." 8/28/07 "bad sewage smell from adjacent house"	N	450 (GPD)
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1986-0411-000 PSSD-2003-0202	1986 2003	36 19	PSSD-1986-0411-000: ~55 ft NE from the store PSSD-2003-0202: on lot [redacted], ~285 ft behind the store	1986 - type II sewage disposal system construction permit. details: capacity 900 gal. 810 sq ft area of absorption trenches, 48 (inches?) from the ground surface to the bottom of the trench, depth of aggregate 13 inches. sewage flows - 300 GPD, area required 810 ft sq. 2003 - low pressure. 1500 gal tank, absorption trenches: require 990 sq ft, 18 ft from ground surface to the bottom of the trench, trench length 27 ft x 2ft, and 18 trenches total. 3 people working in the store and two bedrooms. percolation rate 85 min/in, 360 GPD	Pumping: 4/20/15 - Stewarts Septic Service 4/29/2004 - Letter to property, "there was on your property a "greywater" system installed…part of that system, a septic tank, needs to be abandoned. The presence of that tank is a health and safety concern. If a truck or even tractor stood on the tank, the top could collapse, causing injury or death to tithe operator. "	—	PSD-2003-0202 on lot to the north	N	N	—

Unison, Health Department Research – Septic System

Parcel ID	General System Type	Septic Regulator	Septic Year	Septic Age (2022)	Septic Location	Septic Tank Parameters (if applicable)	Septic Service History	Septic Repair	Additional Sewer Notes	Evidence of Past Sewer Problems?	Evidence of Current Sewer Problems?	Max Site Flow
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1976-0239-000	1976	46	~50 ft from the house in the north corner of the property	capacity, 1000 gal, 450 GPD	Pumping: 6/27/16 - Mckim Construction, 8/02/18 - Stewarts Septic Service	12/5/91 repair record - replacement of septic tank and shifting over, old septic tank to be abandoned 3/27/86 suggesting use of NPDES permit, and small on-site sewage treatment plant to handle wastes generated by the occupants. "after biological treatment, the effluent would be chlorinated and discharged to the road ditch. Multi-flow system unit will be used. 5/12/76 inspection indicates that the septic system "appeared to be operating satisfactorily at the time but is likely undersized by current standards. There is no adequate area to repair this system should it malfunction and need to be replaced. I would recommend water-saving devices be installed on all water fixtures in the dwelling to extent life expectancy of septic systems."	3/18/86 record of inspection shows there was a violation of code and sewage was running to the road	N	N	300 (GPD)
[redacted]	Alternative Pretreatment	PSSD-1977-0259-001	1977	45	~157 ft from route 630, close to the center of the property	existing absorption area- 1050 sq ft, 7 50 ft trenches (3ft wide, 9ft centers) capacity - 600 gal, 50 ft length, 42 ft width, 3 ft deep	OSS Inspection (historic): 1/14/11 - Greenway Engineering OSS Inspection (Routine): 5/22/12, 5/07/13 - Greenway Engineering OSS Inspection-Partial (Routine): 11/17/14 - Greenway Engineering OSS Inspection-Partial (follow up): 12/15/14 - Greenway Engineering OSS Inspection (Routine): 6/11/15 - Greenway Engineering Pumping: 1/20/16 - Stewarts Septic Service OSS Inspection (Routine): 5/26/16, 5/12/17, 6/01/18, 5/15/19, 7/14/20 - Greenway Engineering, 6/30/21 - Jerlyn Solutions	10/25/07 sewage disposal permit for repair 5/19/2000 addition of bull run valve to prevent return of hydraulically influenced effluent from drainfield 3/26/99 sand filter pre-treatment, pump required	7/13/07 estimated average daily flow 315 gpd recirculating sand filter	7/05/2000 record of complaint of odor issues from above ground septic tank 8/26/99 "existing drainfield hydraulically failing" pretreatment with sand filter required	N	450 (GPD)
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1965-0236-000	1965	57	~78 ft north from the unison pottery and tile store	adsorption field: 1200 sq ft of total are in bottom of ditches; 6 ditches, 100ft length 1000 gal septic tank: concrete, length 8 ft, width 4 ft, liquid depth 4 ft, depth of air space 12 inches.	Pumping: 3/22/15 - Fairfax Suburban Septic LLC, 3/05/21 - Loudoun Septic Tank Service Inc	—	—	N	N	0 (GPD)
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1964-0241-000	1964	58	~76 ft NW from the house	drainfield: "upper reserve area" - 3 trenches, 100 ft long, 2 ft wide, 14 ft width required for absorption area "middle reserve area" - 5 trenches, 100ft long, 2 ft wide, 26 ft required for absorption area "lower reserve area" - same as middle septic tank: concrete, length 8ft, width 4 ft, liquid depth 4 ft, air space 12 inches	Pumping: 9/10/20 - Larry Royston Septic LLC	2/7/74 repair permit 6/18/86 for construction, reserve area added for existing 2 bdrm ("upper reserve area") drainfield, further expanded for 4 bdrm addition ("middle reserve area") and added reserve area ("Lower reserve area") 4/16/08 repair to tie new building sewer to old	—	N	N	600
[redacted]	Conventional (Septic with Gravity)	PSSD-1971-0204-000	1971	51	~107 ft NW from the house	1000 gal capacity concrete, length 10 ft, width 4 ft 10in, liquid depth 5 ft, air space 1 ft. Drainfield: 2400 sq ft total area in bottom of ditches, 8 ditches, 100 ft long	Pumping: 3/30/17 - All Star Septic	—	—	N	N	0 (GPD)

Unison, Health Department Research – Septic System

Parcel ID	General System Type	Septic Regulator	Septic Year	Septic Age (2022)	Septic Location	Septic Tank Parameters (if applicable)	Septic Service History	Septic Repair	Additional Sewer Notes	Evidence of Past Sewer Problems?	Evidence of Current Sewer Problems?	Max Site Flow
[redacted]	Conventional	PSSD-1969-0191-000	1969	53	~99 ft from Bloomfield RD, ~76 ft from the SE property line	concrete, length 8 ft, width 4 ft, liquid depth 4 ft. Capacity 1000 gal 4 75 ft ditches, 2 ft wide, 600 sq ft required for absorption field	Pumping: 06/14/21 Loudoun Septic Tank Service Inc	9/11/21 - replace inlet and outlet tees, replace distribution box, reconnect header to existing four lines	—	N	N	135 (GPD)
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1972-0302-000	1972	50	~110 ft NW from the house	septic tank: concrete, 8 feet long, 4 feet wide, liquid 4 feet deep, air space 1 ft total area in bottom of ditches - 1330 sq ft, 7 ditches each 95 ft long	Pumping: 6/25/14, 08/31/16 - Loudoun Septic Tank Service Inc	9/13/05 replaced inlet and outlet tee, replaced distribution box	—	N	N	—
[redacted]	Alternative Pretreatment	PSSD-2006-0249-000 PSSD-1969-0199	2006 1969	16 53	Drainfield located in the NE corner of the property, 75 ft from the new well	recommended installation depth of 14 inches, 3 trenches, reserve required	OSS Inspection (historic): 6/30/11 - Morgan A Kash, Ltd OSS Inspection-Partial (Routine): 10/12/12 - Morgan A Kash, Ltd OSS Inspection (Routine): 3/26/14 - Morgan A Kash, Ltd OSS Inspection-Partial (Routine): 5/18/15, 6/16/16 - Morgan A Kash, Ltd Pumping: 7/13/16 - Stewarts Septic Service OSS Inspection-Partial (Routine): 6/09/17 - Eco Virginia OSS Inspection-Partial (follow up): 9/11/17 - Eco Virginia OSS Inspection-Partial (routine): 4/23/18, 4/26/19, 5/26/20, 5/20/21 - Eco Virginia		Puraflow filter use for pre-treatment with shallow drip (Greenway Engineering)	N	N	600 (GPD)
[redacted]	Alternative Pretreatment & Dispersal	PSSD-2003-0207-000	2003	19	NW from the house	septic drip: total dripped rline provided 950ft of linear dripper line, 1000 gal dosing tank, 0.5 gal ATU, 1900 sq ft total absorption area	OSS Inspection (historic): 6/30/11 - Morgan A Kash, Ltd OSS Inspection-Partial (Routine): 5/14/12 - Morgan A Kash, Ltd OSS Inspection (Routine): 6/13/13 - Morgan A Kash, Ltd OSS Inspection-Partial (Routine): 8/28/15 - Morgan A Kash, Ltd OSS Inspection (follow up): 9/23/15 - Morgan A Kash, Ltd OSS Inspection (routine): 10/16/16 - Morgan A Kash, Ltd OSS Inspection-Partial (follow up): 12/17/16 - Morgan A Kash, Ltd OSS Inspection-Partial (routine): 7/16/17 - Catoctin Environmental OSS Inspection-Partial (follow up): 11/04/17 - Catoctin Environmental OSS Inspection (routine): 9/7/18 - Catoctin Environmental Pumping: 9/17/18, 3/27/19 - Stewart Septic Service OSS Inspection-Partial (follow up): 5/21/19 - Triple R Construction Co Inc Pumping: 9/3/20, 4/29/21 - Five Star Septic OSS Inspection (partial follow up and routine): 9/21/20 and 5/27/21 - Catoctin Environmental	9/17/15 - Inspection results - "1) the level sensor for the pump to the drip irrigation system was not operating properly, 2) the operator has not completed the alternative system inspection" 10/31/16 - Inspection results - "1) the hydraulic unit on the ATU is not dosing correctly, 2) the effluent in the ATU is not visually clear and vigorous boiling is occurring, 3) the effluent pump is not working properly, 4) distribution to the drip irrigation field is not functioning properly" 9/19/17 - Inspection results - "1) the ATU is not functioning per manufacturer's specifications, 2) pump tank and pump are not functioning as intended, 3) the distribution system and drip irrigation field inspections need to be completed" 9/28/18 - Inspection results - "1) effluent pump in the pump chamber not pumping at the proper rate, 2) the level in the pump chamber was high at the time of inspection, 3) the aerobic mechanism does not appear to be functioning well, 4) the distributing valve is not dosing as intended"	—	N	N	450 (GPD)

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Parcel ID	General System Type	Septic Regulator	Septic Year	Septic Age (2022)	Septic Location	Septic Tank Parameters (if applicable)	Septic Service History	Septic Repair	Additional Sewer Notes	Evidence of Past Sewer Problems?	Evidence of Current Sewer Problems?	Max Site Flow
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1974-0292-000	1974	48	75 ft from route 626	1000 gal, concrete, length 8 ft, width 4 feet, liquid depth 4 ft, 1 ft of air space absorption field: 1000 sq ft required, 6 lines, 88 ft long, 2 ft wide, 8 foot centers. Capacity 400 gal	Pumping: 5/11/16 - Loudoun Septic Tank Service	—	—	N	N	—
[redacted]	1. Conventional (Septic with Gravity) Alternative	PSSD-1987-0426-000 PSSD-2003-0202	1987 2003	35 19	87 feet to the left of the house 40 ft from route 626, 123 ft from the edge of the property	absorption trenches: 1800 sq ft required, 9 trenches 2 ft wide, 100 ft long. 600 gal for house, 600 gal for apartments pre-treatment unit 1000 gal	Pumping: 6/1/16 - Mckim Construction, 8/26/19 - Stewarts Septic Service	11/3/05 minor repair- replace distribution box with concrete	system designed for four bedroom house	N	N	600 (GPD)
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1972-0356-000 PSSD-2000-0350-000	1972 2000	50 22	20 ft to Furr road, north of the house	1972 - septic, concrete, 1000 gal capacity, 8 ft length, 4 ft width, liquid depth 4 ft, depth of air space 1 ft. 6 lines, 100 ft long, 1.5ft wide, 8 ft centers, requires 888 sq ft of area for absorption field, total area in the bottom of ditches 900 sq ft	Pumping: 5/19/14, 9/17/14, 3/29/18 - Stewarts Septic Service	—	—	N	N	400 (GPD)
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1986-0431-000	1986	36	east side of the property, 400 ft from the house	10 lines, 60 ft long, 600 gal capacity drain field	Pumping: 8/26/13 - Stewarts Septic Service, 5/3/19 - Mckim Construction	—	—	N	N	—
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1981-0209-000	1981	41	94 ft behind the house, 47 feet from the SW edge of the property	—	Pumping: 4/24/19 - Mckim Construction	—	—	N	N	—
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1982-0187-000	1982	40	665 ft from route 630, 181 ft from the SE side of the property	1480 gal capacity septic tank, distribution box is a split system septic tank - concrete, 10 ft long, 4ft 10 in wide, liquid depth 4 ft 6 in, 1 ft air space absorption trenches - total area of bottom of ditches 1008 sq ft, 6 ditches, 56 ft long	Pumping: 7/16/14 - Stewarts Septic Service	5 lines, 65 ft long, 3 ft wide	—	N	N	—

Unison, Health Department Research – Septic System

Parcel ID	General System Type	Septic Regulator	Septic Year	Septic Age (2022)	Septic Location	Septic Tank Parameters (if applicable)	Septic Service History	Septic Repair	Additional Sewer Notes	Evidence of Past Sewer Problems?	Evidence of Current Sewer Problems?	Max Site Flow
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1977-0239-000	1977	45	~113 ft from route 630, ~127 ft from SW side of property	drainfield: 6 55 ft lines,	Pumping: 12/6/16, 3/19/21 - Powell's Plumbing Inc	8/10/95 permit for repair - building sewer - "cleanouts every 50-60 ft", septic tank - "replace existing if leaking" 3/9/88 remediation to septic problems might include installing a french drain, replacing exiting septic tank, and applying waterproof parge over the interior, or locate and uncover the distribution box to see if its full of willow roots	low flush toilets are required, low flow shower heads and faucets are recommended. 8/8/95 drawing of sewage disposal system shows a "failed system" that was located next to the house 1/8/1988 correspondence notes - "According to previous evaluation of September 27, 1977 the sewage disposal system was of unknown size and age."	Y 1996 - Loudon Dept. of public health said in 1996 "if at any future time water from the drainfield ponds on the soil surface, then pretreatment by sand filter or other technology acceptable to the Heatlh Dept. must be installed at the property owners expense" 3/9/88 problems include backing up of septic system due to perched water table, ("evidenced by grey clay mottles"), high water table in which water is moving laterally over hard rock ("producing a major impact on the septic tank, which is located in a low area"), surface water is accumulating around the septic tank, and "possibly now porous septic tank is resulting in excess water entering the septic tank during wet weather"), sewer line from house to septic tank is at minimal grade, "drainfield appears to be uphill of the septic tank" 1/28/88 "when the septic tank cleaner attempted to pump the tank, a mixture of sewage effluent and groundwater entered the tank from the drainfield area. this indicates that soil in which the drainfield was installed is saturated and may be impeding proper operation of the septic system" may lead to slow flushing toilets, slow draining sinks and tubs, possible backups into the house during soil saturation periods	N	268
[redacted]	Alternative Pretreatment Conventional	PSSD-2008-0107-001 PSSD-1979-0258-000	2008 1979	14 43	back end of the lot furthest away from route 630	2008 - absorption trenches - 1920 sqft required, 3 ft wide, 80 ft long (8 trenches). Pretreatment septic tank, capacity 1100 gal, 1250 gallon pump chamber required (house to distribution box via force main) force main length - 600 ft, discharge rate 43 GPM, 15 ft static head	OSS Inspection (historic): 6/27/11 - Morgan A Kash Ltd OSS Inspection-Partial (Routine): 7/17/12 - Morgan A Kash Ltd Pumping: 8/14/12 - Loudoun Septic Tank Service OSS Inspection (routine): 10/6/13, 6/30/14 - Morgan A Kash Ltd OSS Inspection-Partial (routine): 8/5/15 - Morgan A Kash Ltd Pumping: 8/5/16 - Loudoun Septic Tank Service Inc OSS Inspection (routine): 8/5/16, 5/11/17 - Loudoun Septic Tank Service Inc, 8/29/18, 8/15/19 - Mckim Construction Pumping: 8/26/19, 6/4/20, 6/25/21 - Mckim Construction OSS Inspection (routine): 4/29/20, 5/27/21 - Mckim Construction	9/16/08 - repair (unclear what exactly was being repaired) 6/08 - repair (unclear what exactly was being repaired)	1979 septic system abandoned (letter confirming this 11/5/08	N	N	450 (GPD)
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1990-0190-000	1990	32	in front of house, ~74 ft from NW edge of property, 61 ft from SE edge of property	tank capacity - 900 gal pretreatment unit - 1125 gal (20ft from house) 10 45 ft long trenches	Pumping: 1/5/14, 9/25/19 - Stewarts Septic Service	10/28/19 - component replacement - replace splitter and 2 distribution boxes	—	N	N	450 (GPD)
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1988-0559-000	1988	34	67 ft south of the house	capacity 1200 gal trenches - 8 75ft long, 3 ft wide	Pumping: 3/16/15 - Stewarts Septic Service	—	—	N	N	—

Unison, Health Department Research – Septic System

Parcel ID	General System Type	Septic Regulator	Septic Year	Septic Age (2022)	Septic Location	Septic Tank Parameters (if applicable)	Septic Service History	Septic Repair	Additional Sewer Notes	Evidence of Past Sewer Problems?	Evidence of Current Sewer Problems?	Max Site Flow
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1987-0443-000	1987	35	roughly 145 ft south of the house	septic tank: capacity 900 gal absorption trenches, 6 75ft trenches, 3 ft wide	Pumping: 6/28/17 - Powell's Plumbing Inc	—	—	N	N	—
[redacted]	1. Conventional (Septic with Gravity)	PSSD-1974-0285-000 on different property [redacted]	1974	48	see #15	see #15	see #15	see #15	PSSD-1974-0285 on neighboring property 10/9/15 permit issued for installation of an alternative system - "alternative Norweco Singular Green TNT 500" with french drain and drip dispersal. This system is not in GIS and appears that it was never/not yet installed	see Parcel ID [redacted]		600 (GPD)

Parcel ID	Well ID	Well Year	Well Age (2022)	Well Type	Well Status	Well Location	Estimated water use	Well Class	Well Yield (gpm)	Well Depth (ft)	Other Well metrics	Unsatisfactory water sample/complaint or mention of poor water quality?	Evidence of Past Water Problems?	Evidence of Current Water Problems?	Soils	Other Notes
[redacted]	WWIN-87-0054 WWIN-87-0553 Dug well behind house?	1987	34	Drilled Drilled Dug?	Active? Active? "Not in use"	Exact distance from drainfields not provided but appears to be significant distance away, exact distance from structures/property lines also not provided but appears to satisfy setback requirements	—	—	—	—	Base-elev: 460 Surf-water-elev: 446 Base-elev: 475 Surf-water-elev: 461	N	N	N	—	Restored porch in 1995 6-6-2016 sewage repair permit said 2.5 for "number of marketable bedrooms"
[redacted]	WWIN-89-0664 WWDU-89-0663 WWDU-89-0661 WWIN-89-0662	1989	32	Drilled Dug Dug Drilled	Active? Abandoned? Abandoned? Abandoned?	5-17-2016 LC noted: "Also, note PSSD 1989-0485 and WWIN 1989 are easement property and belong to neighbor. ebk, sjd 5/16/2016" (this document in RME for parcel [redacted]), "This well for property 72/1F is located on Easement 72/1G" WWIN-89-0664 is in an easement on another property, 150' from drainfield one dug well is in a shed? the drilled well on the property is in a pit? unsure exactly where the last dug well is located, not shown on drawing?	—	II — — —	3 — — —	Tot-depth: 580 — — —	drilled well 0664: Base-elev: 465 Stat-depth: 60 Prim-depth: 460 Bedrock-depth: 15 Surf-water-elev: 461 Well-diam: 6 Casing-depth: 61 Grout-depth: 50 dug well 0663: Base-elev: 480 Surf-water-elev: 461 dug well 0661: Base-elev: 480 Surf-water-elev: 461 drilled well 0661: Base-elev: 480 Surf-water-elev: 461	N	N	N	Soil evaluation form 2/24/89, position in landscape satisfactory checked "Yes", slope ~7%, depth to rock/impervious strata max >70 min 53, free water present checked "no", soil percolation rate circled "II" estimated rate 60 min/inch, no percolation test performed	1/23/89 application for construction checked remodeling and said 2 for "number of marketable bedrooms" yes to automatic clothes washers, no to dishwashing machine and garbage disposal units, wrote "duplex" for type of construction 2/28/89 application for construction said 3 for "number of marketable bedrooms", yes to dishwashing machine and automatic clothes washers, no to garbage disposal units 3/28/89 application for construction said 3 for "number of marketable bedrooms", yes to dishwashing machine and automatic clothes washers, no to garbage disposal units, said "remodeling" for single family dwelling 4/25/01 application for evaluation of existing water and/or sewage systems, noted 3 bedrooms and 4 people, yes to garbage disposal and automatic clothes washer
[redacted]	WWDU-82-0190	1982	39	Dug	Active	7 ft from the corner of the house (northwest corner), 50 feet from septic tank, 100 ft from distribution box	300 gpd	IIIC	—	—	Base-elev: 480 Surf-water-elev: 461	N	N	Y - 7/8/21 letter "The current well is a hand dug well that sometimes needs to be filled by outside sources which is not ideal for a water source."	3/25/77 soil evaluation, high flat in short grass + weeds, boring #1 slope A, Horizon: Ap, Depth: 0-12, Texture: Brown, Color: Loam, B 12-23, StBr to LtYB SiL/SiCL, C 23-72t, II, SiL wea GSt Basic Schists Clean to 65" Scatt. concolor plugs below, drawing noted "old barn to go" 9/11/81 soils evaluation, Boring 1-2: Horizon: A Depth: 0-10 Color: Br Texture: L, B 10-18 StBr SdCL, C 18-55" (70" stopped by cobble) StBr BINI LSd *some dense zones, Boring 3-4: A 0-10 Br L, B 10-30 St (Golden) Br SiCL, C 30-75 St(Golden) Br SiL, drawing says "tree and barn have been removed"	3/11/77: general application for construction, septic tank, sec 69 parcel 26A 1.5 acres 8/25/81: general application (497-81) for construction proposed septic tank drainfield system for single family dwelling, 1 kitchen sink (and kitchen), 1 bathroom sink, 1 toilet, 1 shower, 1 bathtub, 1 living room, 1 den, property previously examined by health dept. 1977-W3V 9/11/81: 2 bedrooms automatic washing machine no garbage disposal unit 6/7/21 letter: "I own a property totaling 0.48 acres within the village of unison" 6/8/2021: number of marketable bedrooms 2

Unison, Health Department Research – Water

Parcel ID	Well ID	Well Year	Well Age (2022)	Well Type	Well Status	Well Location	Estimated water use	Well Class	Well Yield (gpm)	Well Depth (ft)	Other Well metrics	Unsatisfactory water sample/complaint or mention of poor water quality?	Evidence of Past Water Problems?	Evidence of Current Water Problems ?	Soils	Other Notes
[redacted]	WWIN-81-0258	1981	40	Drilled	Active	Northeast corner of property	450 gpd	IIB	1	560	Base-elev: 480 Stat-depth: 132 Surf-water-elev: 461 57 feet casing 50 feet grout well yield 1 gpm Steel casing 6 inch diameter 14' depth to bedrock	Y - 5/2/88, 6/22/89, 6/26/89, 6/28/89? unsatisfactory test	Y - unsatisfactory tests	N	Soil evaluation record 5/5/70 Application 40341790001 soil evaluation form, denied is checked, pit #1 Horz Ap Depth 0-8 Description 7.5 YR 5/4 Silt loam granular, Bt1 8-20 10 YR 5/6 Silty Clay subangular blocy w/ intermittent iron concentrations 10 YR 4/6 and Mn 10 YR Z/1 friable to stick, Bt2 20-30 10 YR 4/6 silty clay blocky w/ common clay skins w/ abundant Redox 10 YR 6/2 and Fe + Mn accumulations (same as above) moderately firm *free water seepage*, C 30-60" 10 YR 5/8 silty clay, moist + firm w/ Mn abundance Redox features (grams -- 5Y6/1) — Pit #2, Ap 0-11 10 Yr 4/3 Silt loam granular, Bt 11-22 7.5 YR 5/6 10 YR 6/6 silt loam, subangular blocky (weak), C 22-36 10 YR 6/C Loam firm w/ channels + gravel, Cr 36-42 bedded granite saprolite? reddish/brown w/ abundance gray throughout (Redox), all gradual horizonation in profile February 17, 2014 soil summary report, checked "yes" for "position in landscape satisfactory?" described as backslope, slope 4-6%, geologic province / parent material: Northern Piedmont; Greenstone Schist, vegetation open grass pasture, impervious strata min 34" max 52", depth to seasonal water (gray mottling or gray color) checked "Yes" and wrote 13+ inches, soil percolation rate estimated checked "II" and "III", estimated rate 90 min/inch, permeability test not performed 2/17/4: Hole #1 — Horizon Ap Depth 0-9 inches Descriptions 10 YR 4/3 Loam weak medium subangular blocky friable Texture Group IIB, Bt 9-23 10 YR 4/6 silty clay loam week to moderate medium subangular blocky friable III, Bc 23-34 10 YR 5/4 2.5 YR 6/4 silty clay loam moderate medium subangular blocky moderately friable III, C 34-48 10 YR 6/6 6/8 silt loam structureless massive friable moderately dense in place free water at 16"+ 10 YR 7/2 Redox at 18"+ III, Hole #2 — Ap 0-10 10 YR 4/3 loam weak medium subangular blocky friable IIB, Bt 10-29 10 YR 4/6 5/6 silty clay loam weak to moderate medium subangular blocky friable common stones 20% III, BC 29-41 10 YR 5/4 2.5 Y 6/4 silty clay loam moderate medium subangular blocky moderately friable possible old fill 32" pieces of glass and metal in part of pit 10 YR 7/2 Redox at 13"-14"+ theres also holes 3, 4, 5 and 6	5/4/70 zoning clearance 5/4/70 application to install sewer system, 2 bedrooms, 2 acres, no basement, kitchen sink, laundry tub, lavatory, toilet stool, shower, urinal 4/20/88 (proposed settlement date 5/10/88) application for evaluation of existing water and sewage disposal systems: wrote "yes" for "is an automatic clothes washer or hook-up installed?", number of bedrooms 2, no to garbage disposal, occupied by 1 person for the past 30 days, wrote "no" to "is there discharge of laundry, kitchen, or other waste on top of the ground surface?" evaluation report 6/22/89 (reviewed 7/10/89) 2 bedrooms, automatic washer, no garbage disposal County of Loudoun Zoning / Environmental Health Building Clearance Evaluation Request 8/19/2013: denied, under conditions/reasons wrote: "Not staked, increase in number of bedrooms without comparable reduction in existing dwelling" also electronic note "need to reduce by one bedroom in original house" 8/6/13 building/zoning permit application for new single family/garage (attached) with 9 spaces, 1 bedroom, 1 half bath and 1 full bath drawing titled "garage & apartment" crossed out "& apartment" 8/9/2013 application for building renovation and addition/demo, type of construction: proposed single family dwelling, garage w/ living space above - 1 br, 30401670100 October 2, 2013 email, "I submitted the change of use permit for the existing dwelling at 21092 Unison Rd to make this the accessory dwelling...the title of the permit submission for 21096 Unison Rd should now be "Steve Residence" instead of "garage & Apartment" since this will be the main residence and the existing little dwelling will become the accessory....the submission for the accessory clearly shows the demolition of one wall to make sure this is no misunderstanding about how many bedrooms are in there (now only one)" 5/20/14 design form said 2 bedrooms July 10, 2014 email: "discuss the following issues....a ruling on the issue of removing one bedroom from the existing house and construction of a new bedroom in the proposed. The ruling we are requesting regards is if this will be considered new construction and a reserve is required or since the occupancy has not been changed is our firm's application considered a repair" 11/13/14 email correspondence: "An address of 21096 Unison Road was assigned to the proposed apartment in the detached garage. Health is unable to approve the apartment use as there are problems that exist on the property with respect to drainfields. To remedy the problems will be costly to the owner; therefore they have opted to not have an apartment use on the second-story of the proposed detached garage. Question: Without living space in this proposed detached garage, should the permit be setup under the address of the existing single family dwelling (21092)?" and response 11/14/14 said "It should be set up on the original address. I will remove the 21096 address." 12/23/14 building clearance for detached garage 1/26/2015, T40424420001, "the system is designed for a 3 bedroom house" 2/9/15, 3 bedrm

Unison, Health Department Research – Water

Parcel ID	Well ID	Well Year	Well Age (2022)	Well Type	Well Status	Well Location	Estimated water use	Well Class	Well Yield (gpm)	Well Depth (ft)	Other Well metrics	Unsatisfactory water sample/complaint or mention of poor water quality?	Evidence of Past Water Problems ?	Evidence of Current Water Problems ?	Soils	Other Notes
[redacted]	WWDU-1975-0222 In GIS found in records: WWDU-1976-0222 Not in GIS or records: WWIN-1980/81?-? In GIS, guessing these are the numbers for the two wells: WWIN-1999-0422 WWDH-1999-0664 In GIS not found in records: WWDU-1976-0223 WWIN-1976-0224	1975 1976 1980 1999 1976	47 46 42 23 46	? dug drilled ? Dry hole dug drilled	? Abandoned ? Active abandoned Active active	WWDU-1975-0222: WWDU-1976-0222: ~474 ft from route 630, 41 ft NE from the stables WWIN-1980/81?-: ? WWIN-1999-0422: ~350 ft from route 630, 80ft north from the stables WWDH-1999-0664: ~82 ft west from the stables WWDU-1976-0223: ~160 ft SW from the house WWIN-1976-0224: ~83 ft east from the house	600 gpd	—	? ? ? 1.5 0.5 ? ?	? ? ? 700 1000 ? 300	WWDU-75-0222 base elev 480 surf water elev 475 1980/81? well Total depth 300 yield 2 gpm depth to flow 250' casing extends 18" above grade WWIN-1999-0422 Total Depth: 700 ft Depth to Bedrock: 18 ft Dia: 10-in from 0-60 ft, 6-in from 60-700 ft Casing: 6-in Steel from 1 to 63 ft Grout: 50 ft Class: IIIB 1.5 gpm @ 620' other 1999 well? Total Depth: 1000 ft Depth to Bedrock: 18 ft Dia: 10-in from 0-60 ft, 6-in from 60-1000 ft Casing: 6-in Steel from 1 to 63 ft Grout: 50 ft Class: IIIB 0.5 gpm @ 716'	Y - 1/29/99 well/water system construction permit noted "2 dry to be abandoned" 1/28/00 well/water system construction permit, water supply existing: "drilled (dry) TO BE ABANDONED"	Y - Dry wells	N	10/8/75 soils report, Boring 1: Horizon A Depth 0-10 Texture Loam Color DKRB, B 10-48 Matched? YR/SBn/RY/Red White grey Sandy CLo. 48+ plugged w/ grey clay from used acid (gneiss) and bortec rock (phyllites), Boring 2-3: 0-8 Loam B/DKR, 8-48 weathered gneiss coarse small clay plug?, 48 could not penetrate, boring 4: A 0-8 Loam B/DRgr, 8-20 sictoc? YR to Red, 20-40 Sandy PM from granites gneiss, 40-48 clay DKYB ? matched grey an old rock, relic structure plastic + moist 10/22/75 permit to install sewage disposal system and water: soil study checked "yes" for "naturally drained, suitable by sight", estimated percolation rate > 51, checked "no" for percolation test required, surface drainage not required 6/20/84, Boring 1: Horizon Pp Depth 0-10 Color DK YB Texture V Dny Remarks, B 10-22 YB SCl 10 YR 5/6+8 dense?, C 22-33 B, same st?, B+01 fSl -> fiD? gram/gist mix? dense in place w/ brown clay coats, Cr 33, Boring #2,3,4 coffles? < 12", Boring 5: Ap 0-12 DK YB Sid?, B 12-30 YR Sil?, IIC 30-39 YR SCl moist 37-48 YR/RB Sicl? gist? MNO? 48-64 ST B/ B Sil? 64-66 YB Cl greys at 64, Boring 6: DB 0-10 DK YB Sil, B 10-30 YB Sil '> Cl dense, C 30-40 YR HSil -> SiCl standard w/ minor dense, Cr 40 18"+ R.C flows, Boring #7: Ap 0-10 DK YB Sil, B 10-32 YB almost Cl moist at 18" #5 not until 2' 30", C 32-36 YR SCl dense out bucket chunks sheary mon1 / MNO2, C2 36-40 YB Cl mottles? @ 40, Boring 8: Bp 0-10 DR YB Sil, B 10-22 YR SiCl /> Cl dense, C 22-46 YR w/ BY strange color HSil->fil mottles at 46, Boring 9: D 0-9 DK YB Sil, C 9-32 Stb/YB Sil dense, C2 32-48 STB YB YR Hsil to ? match clay - R YR, IIC 48-57 YR SCl mottles at 57, Boring 10: ? to #8 RATES at 30" 6/25/84 letter: "results of my soils evaluation...a water percolation test to determine rates was requested due to suspected slow absorption rates. The soils have a high clay content throughout, are dense in place with large accumulations of manganese coatings, scattered brown clay flows and grey clay mottles (= water table or very saturated condition) at 46 inches...enclosed list of licensed persons who can conduct the test for you...if the results of the test are satisfactory (i.e. less than 120 min/inch) a permit can be issued." 1/3/85 letter: "On June 20, 1984 a soils evaluation was conducted on the above reference property and a percolation test was required. My letter of June 25, 1984, explained the soil conditions and potential problems associated with these conditions. Inactive applications are voided after sic (6) months, therefore your application will be voided on January 31, 1985" wrote VOID 2-12-85 8/8/85, position in landscape satisfactory checked "yes", slope ~8%, max 40" min 30", avg percolation rate 70, depth to seasonal water table (gray mottling or gray color) 25-30", hole 1 - horizon A 0-6 HBr L very dry horizon B 6-20 pale RdYl SiCL mottling starting about 15" 20-30 pale RdYl SiCL gray clay plugs pale colors & mottling Mg, hole 2 - H. gray brown very dry, stopped by rock 15" puddles in area adjacent to boring, hole 3 - pale YlBr stopped by rock 15" grays on rock faces, hole 4 - stopped by rock 12" pale colors, hole 5 - stopped by rock 12" pale colors talked to...and advised that poor soil was found in the borings. Others stopped by rock - unsure if bedrock or cobbles only way to find out is by backhoe. Advised...of need for backhoe & possibly of soil consultant. Backhoe appt. setup for 8/21/25 at 9:00." 8/21/85 Pit 1 A 0-10 H gray brown L very dry 10 - 48 heavy clay gray clay plugs starting about 25-30", Rd & Yl mottling on west side of pH well H gray brown w/ many rock on east side 8/27/85 letter: "this letter is to confirm our conversation...a water percolation test must be performed in the area of the last pit in an area approximately 50'x50'...due to questionable soil rates" 9/16 & 17/85 soil evaluation percolation test data 10-2-85 soils evaluation percolation test data 10-3-85 soil evaluation report unknown date report pits 2-6	Eight Oaks Farm 9/16/1975 general application for construction, said zoning was A-3 with 86.5 acres in this parcel with 91.5 acres in parent tract, no previous sell-offs, 3 bedrooms 2.5 bathrooms, 3 bathroom sinks, 1 laundry tub, 1 dishwasher, 1 auto. clothes washer, 1 garbage disposal, 3 toilets 1 shower 1 bath tub, living room family room, no den, storage room - two car garage, no fixtures to be installed in basement 6/13/84 application for construction - sewage disposal/water supply, proposed single family dwelling 4 BR checked yes to dishwashing machines and auto clothes washers and no to garbage disposal units 7/22/85 application for construction - sewage disposal/water supply, checked remodeling and wrote kitchen and bath, number of marketable bedrooms 1 10/22/75 permit to install sewage disposal system and water, checked dwelling, noted 3 bedrooms, dishwasher, automatic washing machine, garbage disposal unit 10/15/85 drawing for sewage disposal system construction permit shows two existing barns and one house

Parcel ID	Well ID	Well Year	Well Age (2022)	Well Type	Well Status	Well Location	Estimated water use	Well Class	Well Yield (gpm)	Well Depth (ft)	Other Well metrics	Unsatisfactory water sample/complaint or mention of poor water quality?	Evidence of Past Water Problems?	Evidence of Current Water Problems?	Soils	Other Notes
[redacted]	WWNC-56-0117	1956	66	drilled	active	~50 ft from the NE property line	—	—	—	—	Base-elev: 480, Surf-water-elev: 475	7/5/91 - coliform present in samples from church 08/21/93 - coliform present in samples from church 4/18/95 - coliform present in samples from kitchen at church	Y 9/18/74 - sample unsatisfactory - coliform detected 5/20/1991 - Letter states that "the well also is not generating enough water to be useable" 3/25/91 - complaint that the well serving Betty Miller's property is not providing enough water. Options are to drill another well or construct a storage system.	N	9/13/1992 - soil test performed on neighboring property to determine if a drainfield site could be located there to repair an existing malfunction at the church. "soil study revealed a high water table condition on all of the property examined…site delineated does NOT meet new construction criteria"	—
[redacted]	WWDU-1954-0076 WWIN-1985-0318	1954 1985	68 37	dug drilled	active active	~14 ft from SW property line, ~90 ft from route 630 ~24 ft from NE property line, ~26 ft from route 630	450 gpd	? IIIB	? 1.5	510 ?	depth to bedrock: 40', hole size: 10" from 0-55ft, 6" from 55-510 ft base-elevation: 480 ft, surface water elevation 475	Y	Y 5/9/91 indicates iron, manganese 5/29/91 - water analysis results indicate iron, manganese and turbidity above the MCL in church well. In parsonage well manganese > MCL	N	6/8/89 evaluation - 3% slope, seasonal depth to water table 12 inches, 17-20 inches of free water present, site disapproved for 1) area prone to flooding, insufficient depth to water table, too close to well, not enough drainage area required for drainfield 8/18/92 evaluation - 5% slope, depth of rock 42 inches, depth to water table 36 inches, no free water present, estimated percolation 75 min/in. Site approved, drainfield to be placed at 18 depth	—
[redacted]	WWDU-1954-0076 WWIN-1985-0318	1954 1985	68 37	dug drilled	active active	~14 ft from SW property line, ~90 ft from route 630 ~24 ft from NE property line, ~26 ft from route 630	451 gpd	? IIIB	? 1.6	510 ?	depth to bedrock: 40', hole size: 10" from 0-55ft, 6" from 55-510 ft base-elevation: 480 ft, surface water elevation 475	Y 2/26/90 - "Violation notice posted" in regards to bacteria test	Y	N	—	—
[redacted]	WWIN-1975-0157 WWIN-2005-0046 WWIN-1980-0247 WWIN-1989-0681 WWIN-93-0055 (not in GIS) WWDU-1975-0156 (not in records)	1975 2005 1980 1989 1993 1975	47 17 42 33 29 47	dug drilled drilled drilled drilled ?	abandoned active (house well) abandoned (irrigation well, "in the shed") Active (irrigation well) ? ?	WWIN-1975-0157: ~30 ft south from the house WWIN-2005-0046: west corner of the property, ~31 ft from route 630 WWIN-1980-0247: ~166 ft SW from the house WWIN-1989-0681: ~225 ft SE from the house WWIN-93-0055 (not in GIS): ? WWDU-1975-0156 (not in records): appears to be beneath the house	—	IIIB IIIB ? ? IIIB ?	? 0.5 ? ? ? ?	0-100 500 310 ? ? ?	WWIN-1975-0157: base elevation 480, surface water elevation 475 WWIN-2005-0046: hydrofrack permit. depth to bedrock - 13 ft, WWIN-1980-0247: Base elevation 485, surface water elevation 470, 6 in well diameter, casting 22 ft deep, casing extends 18 inches above ground, capacity is 1GPM WWIN-1989-0681: base elevation 475, water surface elevation 470 WWIN-93-0055: Base elevation 485, surface water elevation 470	Y 1/19/1983 complaint of petroleum odor in the water, water samples submitted for testing and came back satisfactory 5/14/91 - record of complaint that states black-silt looking water, very low pressure. Suspects sewage backing up into water supply and possibly more than one dwelling on the well.	Y	N	11/25/2013 evaluation of primary area - 3-4% slope, depth to rock 44", no free water present, soil percolation texture group III estimated 65 min/in 11/25/2013 evaluation of reserve area - 4-5% slope, depth to rock 43", no free water present, depth to seasonal water table 33", soil percolation texture group III estimated 65 min/in 10/26/1970 - "There is an area of soil about 125 feet east of an old apply tree and south of a lane where the soil is well drained and suitable for use as a septic tank drainage field. The soil between this area and the barn has hardpan in the subsoil and is poorly suited for use as a septic tank drainage field. The soil on the slope west of the barn is thin, has been badly eroded and the parent materials is near the surface - this area is poorly suited for use as a septic tank drainage field."	2 story residence with three bedrooms, and two full baths upstairs, and one powered room 1/2 bath; two floor horse barn with 3 stalls and a wash wall, finished studio building with no bathroom, small garden building with electrical and water permit to add porch to the house granted 11/29/04

Unison, Health Department Research – Water

Parcel ID	Well ID	Well Year	Well Age (2022)	Well Type	Well Status	Well Location	Estimated water use	Well Class	Well Yield (gpm)	Well Depth (ft)	Other Well metrics	Unsatisfactory water sample/complaint or mention of poor water quality?	Evidence of Past Water Problems?	Evidence of Current Water Problems?	Soils	Other Notes
[redacted]	WWIN-2020-0073 WWN-1968-0130 WWN-68-0131	2020 1968 1968	2 54 54	drilled ? ?	active abandoned ? ?	~105 ft SW from the house ~25 ft SE from the house ~120 ft from route 630, ~90 ft from NE property line	—	IIIB ? ?	5 ? ?	540 ? ?	depth to bedrock 29 ft; hole size: 10 in from 0-68 ft, 6 inches from 68-540 ft, static water level is 55 ft base elevation 480, surface water elevation 435 base elevation 465 ft, surface water elevation 435 ft	Y 10/8/2020 - Water quality analysis of well water indicates that iron, turbidity, and hardness are above the standard	Y	N	7/16/97 soil evaluation (Lot 1-resub, west side slope) - 6-8% slope, no free water present, soil percolation rate estimated at 60min/in 10/2/97 soil evaluation (reserve for existing house) - 8-10% slope, narrow ridge and side slope, soil percolation estimated at 30-40 min/inch	—
[redacted]	WWDU- 62-0117 WWIN-1111-0062	1962 2001 (reworked)	60 60	dug drilled	abandoned (2012) Active	southeast corner of property	—	? IIIB	? 2.5	? 800	WWDN-62-0117: base elevation 480ft, surface water elevation 461 ft WWDN-1111-0062: hydrofracked at 100,200,and 300ft; static water level 55 ft. Casing diameter 6 inches, casing bottom depth 107ft	Y	Y 6/30/07 document mentions on an application for evaluation of water a past problem: hydrogen sulfide	N	—	As of 2007, 3 bedrooms on the property
[redacted]	WWIN-1986-0483	1986	36	drilled	active	~53 ft NW from the back of the store	—	IIIB	—	1000	depth to bedrock, 13 ft, whole size 10 in from 0-63 ft, 6 in from 63-1000 ft. Stabilized measured pumping water level: 600 ft originally 605 t deep, static water level 50 ft. "hydrofracked 100ft, 200ft, 300ft" base elevation 480 ft, surface water elevation 475 ft	N	N	N	9/10/84 - Letter to property owner: "soils on the lot are not very good for wastewater disposal" 2/25/?? - slope 6%, depth to rock, 42 inches, no free water present, soil percolation rate estimated at 85 min/in 3/30/87 - water percolation test necessary for the site because of the heavy silt subsoil and the manganese oxide deposits and red clay plugs which are evidence that water is slowing down as it moves through the soil.	2/4/87 construction permit for 2 bdrm apt above store.
[redacted]	WWIN-1976-0219	1976	46	drilled	active	~56 ft from route 630, close to the SW edge of the property	—	—	—	—	base elevation 480 ft, surface water elevation 474ft	N	N	N	—	in 2002 the owners added a two bedroom apt over the store
[redacted]	WWDH-1977-0275 WWDU-1977-0274 WWIN-1984-0236	1977 1977 1984	45 45 38	drilled dug ?	abandoned active active	WWDH-1977-0275: at route 630 close to the east edge of the property WWDU-1977-0274: appears to be underneath the house WWIN-1984-0236: ~272 ft from route 630, close to the west side of the property	—	IIIC ? ?	—	—	—	7/18/05 record of complaint states "chemically smelling water"	N	N	8/25/77 sewage disposal system inspection mentions solid conditions indicate that system may be unsatisfactory as designed "soil conditions are marginal at best due to flat topography and clayey soils…should premature failure occur, aerobic effluent treatment will be required"	3/6/97 mudroom addition approved

Unison, Health Department Research – Water

Parcel ID	Well ID	Well Year	Well Age (2022)	Well Type	Well Status	Well Location	Estimated water use	Well Class	Well Yield (gpm)	Well Depth (ft)	Other Well metrics	Unsatisfactory water sample/complaint or mention of poor water quality?	Evidence of Past Water Problems?	Evidence of Current Water Problems?	Soils	Other Notes
[redacted]	WWDU-1111-0436 WWIN-1965-0145	? 1965	? 57	dug drilled	unknown active	WWDU-1111-0436: ~32 ft NE of route 630, along the center of the property WWIN-1965-0145: ~30 ft NW of route 630, along the center of the property, slightly to the east of the well above	—	—	—	—	? Base elevation 480 ft, surface water elevation 471 ft	N	6/16/82 "drilled well going dry, requested permission to hook dug well to toilets only"	N	8/26/65 record of inspection-sewage disposal system: "soil condition may cause problems, however small water usage will help"	—
[redacted]	WWDU-1964-0159 WWIN-2008-0076	1964 2008	58 14	hand-dug drilled	abandoned active	? rt 7 W, Rt 690 S, Right on Foxcroft Rd, Left on Unison Rd, through stop sign to 21111 on Right	—	? IIIB	? 5	? 540	WWDU-64-0159: base elevation 485 ft, surface water elevation 475ft WWIN-2008-0076: depth to bedrock 22ft, hole size - 10 in from 0-68 ft, 6 inches from 68-540 ft, static water level 60 ft	iron > MCL, turbidity > MCL (5/9/08)	Y	N	10/6/16 correspondence: "soil and site conditions are suitable for installation of an onsite sewage disposal system slope 5%, no free water present, no percolation test performed,	4 bedroom housing unit
[redacted]	WWDU-1971-0171 WWIN1971-0172	1971	51	dug ?	active active	WWDU-1971-0171: 35 ft south from the house WWIN1971-0172: ~173 ft SE from the house	—	—	? ?	? ?	WWDU-71-0171: 470ft base elevation, 455 ft surface water elevation WWIN-71-0172: same	N	N	N	soil study 2/20/69 - naturally drained, suitable by site, medium roughness, 5+ ft depth to water table	in ground pool (90ft from septic, 200+ feet from wells) construction projects include - inground pool; addition of sunroom; take off deck and build a porch (smaller footprint); addition of a stable with 3 bedrooms (3 toilets, 2 bathtubs, 3 laundry, 1 laundry tub, 1 shower, 1 kitchen sink; residential studio
[redacted]	WWDU-1969-0134 WWIN-1972-0249	1969 ?	53 ?	dug ?	active active	WWDU-1969-0134: ~28 ft from Bloomfield RD, just north of the driveway WWIN-1972-0249: ~30 ft from the northern property line, 84 ft from Bloomfield RD	—	IIIB	? ?	360	10 ft to bedrock, 480 ft base elevation, 475 ft surface water elevation	N	N	N	—	construction projects include: adding second level to the house (2001)
[redacted]	WWIN-2000-0558 WWDH-2000-0739	2000 1972	22 50	drilled ?	active abandoned	WWIN-2000-0558: ~100 ft west from the house WWDH-2000-0739: ~150 ft SW from the house	—	IIIB	1	360 620	—	N	N	N	1/28/72 soil evaluation: #1 - silty (0-6 in), clay loam (6-25 in), SAB (25-40 in), no limitations here #2 - severe drainage, water seepage into test hold in 5 min	—
[redacted]	WWIN-1969-0141 WWIN-2007-0191	1969 2007	53 15	? ?	active ?	near the SW corner of the house 69 ft from the SE corner of the house, 38ft from the road	—	? IIB	? ?	? 800	—	N	N	N	Depth to rock, pans or impervious strata 41 in; depth to gray mottles 38 in, 2% slope	—
[redacted]	WWIN-1111-0061 WWIN-2006-0686	? 2006	? 16	? drilled	active active	northwest of the house 70 ft from the barn to the left of the driveway	—	? IIIB	? 1	? 700	? Depth to bedrock 22 ft, hole size- 10 in from 0-61ft, 6in from 62-700 ft	N	N	N	backslope: 6-8% slope, 24inches to seasonal water, no free water present, soil texture group II and III, estimated percolation rate 75 min/inch side slope: <10% slope, no free water present, texture group II and III, estimated percolation 75 min/in, 22 inches o seasonal water table	—

Unison, Health Department Research – Water

Parcel ID	Well ID	Well Year	Well Age (2022)	Well Type	Well Status	Well Location	Estimated water use	Well Class	Well Yield (gpm)	Well Depth (ft)	Other Well metrics	Unsatisfactory water sample/complaint or mention of poor water quality?	Evidence of Past Water Problems?	Evidence of Current Water Problems?	Soils	Other Notes
[redacted]	WWIN-1974-0244	1974	48	?	active	~63 ft SE from the house	—	III	?	?	base elevation 485 ft, surface water elevation 470 ft	N	N	N	boring 1: silt,/loam (0-8), clay/loam (8-24), "mixed basic schist and granite rock boring 2: loam (0-8), clay/loam (8-20), loamy mixed acid (20-40), hard rock (40+) boring 3: loam (0-8), clays (8-36), mixed acid and basic materials (36-42), hard rock (42+) boring 4: loam (0-4), [can't decipher handwriting] (4-12), granite material (12+)	building permit for 2nd story rec room and work shop (not sure which year)
[redacted]	WWIN-1987-0556 WWIR-1987-0555	1987 1987	35	drilled drilled	active active (Irrigation)	behind Unison Store	—	II	5	805 705	WWIN-1987-0556: distance to nearest well 1000ft, distance to nearest sewage disposal system 300ft, unpumped static water level 50 ft below surface hydrofrack by A&M Drilling (10/26/89): well water,1500 psi, 33 minutes, 3000 gals used, supply chlorinated after fracturing base elevation 480 ft, water surface elevation 460 ft, **mention of a third well in files (no id, not in GIS): 445 ft deep, installed 4/10/90, water bearing zone 250ft**	Y 11/2/87 sample from kitchen sink returned "unsatisfactory"	Y	N	unison store: 5-8% slope, 13-25 inches to seasonal water table, no free water present, soil texture group III, estimated percolation 60min/in behind unison store, facing sideslop: 7-9%, no free water present, soil texture group II, estimated percolation 45min/in	1989 added rec room, bedroom and bath above the carport
[redacted]	WWIN-1965-0141 WWIN-1965-0142 WWIN-1997-0353	1965 1965 1997	57 57 25	drilled	Active informally abandoned active	basically under the house, near the porch next to the driveway, 21 ft from the road 55 ft north from the top of the drive way	—	? ? IIIB	? ? 9	50 (alleged) ? 360	WWIN-1965-0141 base elevation 670 ft, surface water elevation 670 ft WWIN-1965-0142 base elevation 670 ft, surface water elevation 615 ft WWIN-1997-0353 depth to bedrock 6 ft, hole size - 10 inches from 0-60ft, 6 inches from 60-360 ft	N	N	N	soil deemed not acceptable for installation of a drainfield; limited area, well restrictions, surface drainage, internal drainage to water table	7/6/89 bedroom, living room, dining room and two bathrooms addition 9/8/97 garage addition/remodeling 11/6/192 bedrooms, daily flow 400 gpd
[redacted]	WWIN-1973-0272 WWIN-1999-0420	1973 1999	49 23	—	active active	south corner of the property, 34 ft from route 736 and 24 ft from route 626 north side of the property, 86 ft from the road	—	IIIB	0.75 7	360 680	WWIN-73-0272: base elevation 485 ft, surface water elevation 470 ft, WWIN-99-0420: depth to bedrock 18ft, hole size - 10 in from 0-60ft, 6 inches from 60-680 ft	Y WWIN-99-0420 water quality testing 8/29/2000: iron, manganese detected < MCL	Y application for water permit from 5/14/99 says "well low yield, need to drill a new well"	N	soil evaluation for drainfield for "second dwelling on the property": <10% slope, no free water present, soil texture group II and III, estimated percolation rate 60min/in	—
[redacted]	WWIN-1986-0505	1986	36	drilled	active	117 ft from the road, 152 ft from the southeast edge of the property	—	III	1	600	base elevation 475 ft, surface water elevation 460,depth to flow 80 ft	N	N	N	slope 5-8%, no free water present, soil texture group III, estimated soil percolation rate 60 min/in	—
[redacted]	WWIN-1981-0256 WWIN-1981-0257	1981	41	drilled drilled	informally abandoned active	on the property line between this lot and [redacted], 23 ft from the road NW side of the property, 10 ft off the road	? ?	III II	? 0.5	? 600	Base elevation 480 ft, surface water elevation 461 ft base elevation and surface water elevation same as above, stat-depth 115 ft, depth to bedrock 18ft, hole size - 10 in from 0-55ft, 6 in from 55-600ft	N	N	N	—	4/19/12 replacement shed construction

Unison, Health Department Research – Water

Parcel ID	Well ID	Well Year	Well Age (2022)	Well Type	Well Status	Well Location	Estimated water use	Well Class	Well Yield (gpm)	Well Depth (ft)	Other Well metrics	Unsatisfactory water sample/complaint or mention of poor water quality?	Evidence of Past Water Problems?	Evidence of Current Water Problems?	Soils	Other Notes
[redacted]	WWIN-1982-0211	1982	40	drilled	active	NE corner of the property near route 630	600 gpd	III	?	?	base elevation 488 ft, surface water elevation 461 ft	N	N	N	soil evaluation 12/13/94 - "lower steep side slope and upper ridge side slope": 21% slope, no free water present, soil texture group II and III, estimated percolation rate 64-70 min/in soil evaluation 9/26/86 - "knoll" : 0-4% slope, no free water present, soil texture group III, estimated percolation rate 65 min/in. drainfield to be placed at 24 in depth at this site	5/10/95 permit for construction of a barn house is 4 bdrm (updated from 2 to 4 bedrooms in 1986)
[redacted]	WWIN-1977-0253	1977	45	?	active	47 ft from route 630, ~48 ft from SW edge of property	?	?	30	120	base elevation 475 ft, surface water elevation 465 ft	Y 1/4/88 bacteriological examination of water returns "unsatisfactory"	N	N	8/3/95 "soil study soil conditions are terrible", sewage disposal system comes with conditions, pre-treatment by sand filter or peat system may be necessary/ are suitable slope 1-2%, 18 inches to seasonal water table, 18-25 inches of free water present, soil texture group III, estimated percolation rate 80-90 min/in	—
[redacted]	WWIN-1979-0260	1979	43	drilled	active	167 ft from route 630, NE of the house	?	IIIC	?	?	base elevation 485 ft, surface water elevation 475 ft	N	N	N	soil texture group III	As of 2008 - 3 bedrooms, 2.5 bathrooms, 3 people occupying, 5 loads of laundry a week,
[redacted]	WWIN-1990-0094	1990	32	drilled	active	in front of garage, ~80 ft from NW edge of property, ~41 ft from NE edge of property	?	II	2.5	445	hole size: 6 inches from 0-520 ft static water depth 195 ft base elevation 475ft, surface water elevation 465ft	Y 5/23/90 water analysis report shows: iron (limit 0.3mg/l, water has 4.1 mg/l), manganese (limit 0.05 mg/l, water has 0.32 mg/l), sodium (limit 20mg/l, water has 27 mg/l)	Y 3/23/06 "owner inquired @ well yield/depth, going dry at times"	N	soil evaluation - "open lawn with gentle slope" - 0-3% slope, depth to rock Max 55 in, min 46 in, no free water present, soil texture group II, estimated percolation rate 60-65 min/in	construction: in ground pool (2001) (~130 ft from septic, 46 ft from well) garage (1997) sunroom (1995)
[redacted]	WWIN-1988-0670	1988	34	drilled	active	roughly ~250 ft north of the house	?	IIIC	1.5	495	base elevation 445ft, surface water elevation 395 ft well was approved to be deepened to 600 ft in1998 but GIS data shows depth of well to be 495 ft	N	Y 10/27/99 well/water system construction permit says "drilled well going dry"	N	slope5-8%, depth to rock maximum 72 inches, minimum 6 inches, no free water present, soil texture group III, estimated percolation rate 60min/in, no percolation test performed north facing side: <10% slope, depth to rock maximum 60+ inches, minimum 54 inches, no free water present, soil texture group II, estimated percolation rate 45-50 min/in, no percolation test performed	in ground pool (1988) - (~136 ft from septic, 200+ ft from well)
[redacted]	WWIN-1987-0573 WWIN-1994-0032	1987 1994	35 28	drilled	Active active	on property line at route 736, ~100 ft SE from the driveway ~400 ft NE from the house	600 GPD	IIIB IIIB	3-4 7.5	660 560	WWIN-87-0573: base elevation 480 ft, surface water elevation 470 ft, well diameter 6 inches, bedrock depth 32 ft? WWIN-94-0032: base elevation 445 ft, surface water elevation 440ft, depth to bedrock 25 ft, well diameter 6 inches	N	Y 1/27/94 permit says "must abandon old well, dry well…existing well must be abandoned as per health dept. specification"	N	slope ~5%, depth to rock maximum 56 inches, minimum 26 inches, depth to seasonal water table is 60 inches, no free water present, solid texture group III, estimated percolation rate is 60 min/in	4 bdrms

Unison, Health Department Research – Water

Parcel ID	Well ID	Well Year	Well Age (2022)	Well Type	Well Status	Well Location	Estimated water use	Well Class	Well Yield (gpm)	Well Depth (ft)	Other Well metrics	Unsatisfactory water sample/complaint or mention of poor water quality?	Evidence of Past Water Problems?	Evidence of Current Water Problems?	Soils	Other Notes
[redacted]	WWIN-2005-0601	2005	17	drilled	active	~240 feet behind (SW) of the house on lot [redacted]	—	IIIB	1	800	depth of bedrock 25 ft, hole size: 10 inches from 0-68 ft, 6 inches for 68-800 ft	Y 11/15/05 water analysis results show Iron, manganese exceed the MCL	Y	N	3/9/05 soil evaluation: <10% slope, depth to seasonal water table is 20 inches, free water is present, soil texture group II and III, estimated percolation rate is 60 min/in, no percolation test performed 10/3/01 "side slope" soil evaluation: <10% slope, 22,28inches to seasonal water table, no free water present, soil texture group II and III, estimated percolation rate 75 min/in, no percolation test performed. Note on this soil eval says "existing garage over septic tank/distribution box" third soil evaluation 8/14/2001: slope 2%, depth to seasonal water table 38 inches, no free water present, soil texture group II and III, estimated percolation rate 75 min/in, no percolation test performed	9/21/19 application for a sewage disposal system for 4 bdroom house
[redacted]	WWIN-1999-0423	1999	23	?	active	77°47'24.478"W 39°2'16.394"N	—	?	2	720	—	—	—	—	—	—

Appendix D

Survey Results

Unison, Property Information

Extra Question from Draft Survey 3.1		Extra Question from Draft Survey 4		Extra Question from Draft Survey 5	
*Qualitative question	If any, specify additional structure(s)/ property uses	Full	Seasonal	Average:	3
		15	1	Min:	2
				Max:	4
		Is the primary structure for seasonal use or full-time use?		If applicable, number of bedrooms in primary structure?	
Answer:		**Answer:**		**Answer:**	
1	—	**1**	—	**1**	—
2	—	**2**	—	**2**	—
3	Studio barn	**3**	full time	**3**	3
4	—	**4**	full-time	**4**	3
5	2 barns.	**5**	Full time use	**5**	3
6	—	**6**	—	**6**	—
7	—	**7**	—	**7**	—
8	Home Office and a Chicken Coop	**8**	Full Time	**8**	4
9	garden shed	**9**	full-time	**9**	4
10	—	**10**	full time	**10**	2
11	Barns, Paddocks	**11**	full time	**11**	3
12	—	**12**	—	**12**	—
13	Barn/garage	**13**	Full time	**13**	2
14	—	**14**	Full Time	**14**	3
15	Farm, barns, office, agricultural	**15**	Full time	**15**	3
16	Studio	**16**	Full time	**16**	2
17	—	**17**	Full time	**17**	4
18	—	**18**	full time	**18**	2
19	—	**19**	Full Time	**19**	4
20	It serves as a community center and upstairs apartment rental	**20**	seasonal part-time use	**20**	2
21	House, guesthouse, barn	**21**	Full-time	**21**	4

Unison, Sewer Survey

Question 1			What type of sewage disposal system(s) do you have (septic tank with drain field, pump and haul, pit privy, other, etc.)?
Septic Tank with Drainfield	Pump and Haul	Alternative	
15	1	4	

Question 2		What year was the current sewage disposal system(s) installed (estimate if unkown)?
Average:	1998	
Min:	1971	
Max:	2016	
N/A or no answer	6	

Answer:		Answer:	
1	septic tank with drainfield	**1**	1995
2	septic	**2**	2004
3	Septic with drain field Two systems on property - (1) for dwelling, (2) barn and studio.	**3**	2015
4	septic tank w/ drain field	**4**	N/A
5	Septic/drain field	**5**	Late 80's on construction of house
6	septic tank + drainfield	**6**	2015
7	Approved for a 4 bdr alternative system	**7**	N/A
8	Septic tank, Pump Tank, up hill to drain field on neighhbors property.	**8**	1989 I think
9	septic tank with drain field	**9**	1989
10	Alternative	**10**	2007 or 2008
11	Septic Tank/Drainfield	**11**	1975
12	Drain Field	**12**	—
13	Pump & haul	**13**	2016
14	Alternative dispersal	**14**	?
15	Septic and drain field	**15**	??
16	Septic tank with drain fiel	**16**	1971
17	Alternative septic with drain field	**17**	1998?
18	septic tank & drain field	**18**	—
19	septic with drain field	**19**	1990
20	alternative dispersal	**20**	??
21	Septic w/ drain field	**21**	~10 years

Unison, Sewer Survey

Extra Question from Draft Survey		Are you the original owner of the current sewage disposal system?	Extra Question from Draft Survey 1		Have bedrooms been added since installation of the current sewage disposal system?	Extra Question from Draft Survey 2		Do you have an automatic clothes washer installed?	Extra Question from Draft Survey 3		Do you have a garbage disposal installed?
Yes	No		Yes	No		Yes	No		Yes	No	
3	13		2	14		16	0		8	8	
Not asked:	5		Not asked:	5		Not asked:	5		Not asked:	5	

Answer:		Answer:		Answer:		Answer:	
1	—	**1**	—	**1**	—	**1**	—
2	—	**2**	—	**2**	—	**2**	—
3	Of the new one not the old one	**3**	no	**3**	yes	**3**	no
4	No	**4**	No	**4**	yes	**4**	Yes (we don't use it)
5	NO	**5**	NO	**5**	Yes	**5**	Yes
6	—	**6**	—	**6**	—	**6**	—
7	—	**7**	—	**7**	—	**7**	—
8	No	**8**	No	**8**	Yes	**8**	Yes
9	no	**9**	no	**9**	yes	**9**	yes
10	no	**10**	no	**10**	yes	**10**	no
11	no	**11**	no	**11**	yes	**11**	yes
12	—	**12**	—	**12**	—	**12**	—
13	Yes	**13**	No	**13**	Yes	**13**	No
14	No	**14**	No	**14**	Yes	**14**	Yes
15	yes	**15**	no	**15**	yes	**15**	no
16	No	**16**	Yes	**16**	Yes	**16**	No
17	No	**17**	No	**17**	Yes	**17**	No
18	No	**18**	No	**18**	Yes	**18**	No
19	No	**19**	Yes	**19**	Yes	**19**	Yes
20	No	**20**	No	**20**	yes	**20**	no
21	no	**21**	No	**21**	Yes	**21**	Yes

Unison, Sewer Survey

Question 3			Question 4			Extra Question from Draft Survey 4			Question 5		
Yes	No	N/A or no answer:	Yes	No	N/A	Offsite	On property	Not Identified	Average:	3.5	Not Asked:
3	16	2	0	20	1	3	11	2	Min:	2	16
						Not asked:	5		Max:	5	N/A:
									# Answered:	4	1
Is there a sewage ejector pump inside the house (typically in basement level)*			Do you have a pool or hot tub that drains into the sewage disposal system?			Is the entire sewage disposal system on your property or offsite within easements?			How often is your septic tank pumped out (if applicable)?		

Answer:		Answer:		Answer:		Answer:		
1	no	**1**	no	**1**	—	**1**	2	years (approximately)
2	no	**2**	no	**2**	—	**2**	5	years
3	No	**3**	no	**3**	on property	**3**	not asked	
4	no	**4**	no	**4**	On property	**4**	not asked	
5	(A ‘sump pump?’ yes	**5**	No	**5**	On property	**5**	not asked	
6	no, outside pump	**6**	No	**6**	—	**6**	2	years
7	N/A	**7**	N/A	**7**	N/A	**7**	N/A	
8	No	**8**	No	**8**	Offsite easements	**8**	not asked	
9	no	**9**	no	**9**	offsite with easement	**9**	not asked	
10	no	**10**	no	**10**	Our property	**10**	not asked	
11	no	**11**	no	**11**	On property	**11**	not asked	
12	No	**12**	No	**12**	—	**12**	5	years
13	—	**13**	No	**13**	On my property	**13**	not asked	
14	No	**14**	No	**14**	On Site	**14**	not asked	
15	no	**15**	no	**15**	on the property	**15**	not asked	
16	No	**16**	No	**16**	No	**16**	not asked	
17	Yes	**17**	No	**17**	drain field offsite with easements	**17**	not asked	
18	No	**18**	No	**18**	on property	**18**	not asked	
19	Yes	**19**	No	**19**	Yes	**19**	not asked	
20	no	**20**	no	**20**	yes on	**20**	not asked	
21	No	**21**	No	**21**	Onsite	**21**	not asked	

Unison, Sewer Survey

Question 6			When was the last time your septic tank was pumped out (if applicable)?	Extra Question from Draft Survey 5		Has use of the property changed since installation of the current sewage disposal system?	Extra Question from Draft Survey 6		If yes, describe changes (day care? Home business?)	Extra Question from Draft Survey 7		How many people living in the dwelling on a full-time basis in the last 30 days?
Average:	2020	N/A or no answer:		Yes	No		*qualitative question			Average:	2	
Min:	2016			0	16		Not asked:	5		Min:	1	
Max:	2021	3		Not asked:	5					Max:	4	
# Answered:	14									Not asked:	5	
Answer:				**Answer:**			**Answer:**			**Answer:**		
1	2020			**1**	—		**1**	—		**1**	—	
2	2018			**2**	—		**2**	—		**2**	—	
3	2021			**3**	no		**3**	—		**3**	3	
4	2016			**4**	no		**4**	—		**4**	2	
5	2 years ago			**5**	no		**5**	—		**5**	1	
6	2020			**6**	—		**6**	—		**6**	—	
7	N/A			**7**	—		**7**	—		**7**	—	
8	3/2020, Pump Tank and Dist Boxes Replaced			**8**	no		**8**	—		**8**	3	
9	2019			**9**	NO		**9**	—		**9**	2	
10	N/A			**10**	none		**10**	—		**10**	2	
11	2 years			**11**	no		**11**	—		**11**	3	
12	3 years ago			**12**	—		**12**	—		**12**	—	
13	About every 30 days @ $275			**13**	No		**13**	—		**13**	2	
14	?			**14**	No		**14**	—		**14**	2	
15	last year			**15**	no		**15**	—		**15**	2	
16	2021			**16**	No		**16**	—		**16**	2	
17	April 2022			**17**	No		**17**	—		**17**	1-2	
18	—			**18**	No		**18**	—		**18**	2	
19	3 years ago			**19**	No		**19**	—		**19**	2	
20	??			**20**	No		**20**	—		**20**	3	
21	Last year			**21**	No		**21**	—		**21**	4	

Unison, Sewer Survey

Question 7		How long have you lived at this address?	Question 8		Are you aware of any sewage disposal system repairs, sewage on the ground or backups in the house?	Question 8.1	If Yes, describe event or repair and number of service calls, and year event/repair occurred	Question 9			Are you aware of any standing water near or on the drainfield (if applicable)?	Question 9.1	If Yes, describe the volume of water and frequency:
Average:	12.9		Yes	No		*Qualitative question		Yes	No	N/A		*Qualitative question	
Min:	0.4		4	17				1	19	1			
Max:	50												
N/A	1												
Answer:			**Answer:**			**Answer:**		**Answer:**				**Answer:**	
1	22	years	**1**	no		**1**	—	**1**	no			**1**	—
2	17	years	**2**	no		**2**	—	**2**	no			**2**	—
3	9	years	**3**	Yes		**3**	Two minor back up after major rain / snow events (never into house). Emergency pump out. So far okay since then.	**3**	none			**3**	—
4	5	years	**4**	no		**4**	—	**4**	no			**4**	—
5	17	years	**5**	no		**5**	—	**5**	no			**5**	—
6	6	years	**6**	no		**6**	—	**6**	no			**6**	—
7	no house yet		**7**	—		**7**	—	**7**	—			**7**	—
8	18	years (Since March 2004)	**8**	Yes Repairs		**8**	We spent $14000.00 replacing the Septic Pump Chamber in Feb/March of 2020.. In addition to the pump chamber the three distribution boxes were replaced at the top of the drain-field.. All was inspected by the county and passed inspection.	**8**	No			**8**	—
9	21	years	**9**	NO		**9**	—	**9**	no			**9**	—
10	7.7	years	**10**	none		**10**	—	**10**	none			**10**	—
11	38	years	**11**	no		**11**	—	**11**	NO			**11**	—
12	0.42	years (5 months)	**12**	No		**12**	—	**12**	No			**12**	—
13	16	years	**13**	No		**13**	—	**13**	No			**13**	—
14	4	years	**14**	No		**14**	—	**14**	No			**14**	—
15	3	years	**15**	no		**15**	—	**15**	no			**15**	—
16	50	years	**16**	E Yes		**16**	Over 50 years several sewage backups after heavy rainfalls. These episodes followed by septic tank pumping and when conditions dry with normal weather.	**16**	Yes			**16**	Some standing water over septic tank on occasions described above
17	1	year	**17**	No		**17**	—	**17**	No			**17**	—
18	2.17	years	**18**	No		**18**	—	**18**	No			**18**	—
19	3	years	**19**	Distribution box replaced		**19**	Replaced when we bought house.	**19**	No			**19**	—
20	Community Center/Not a residence		**20**	No		**20**	—	**20**	no			**20**	—
21	5	years	**21**	No		**21**	—	**21**	No			**21**	—

Unison, Sewer Survey

Question 10				Question 10.1		Question 11		
Yes	No	N/A	Are you aware of any foul odors near the drainfield or septic tanks (if applicable)?	*Qualitative question	If Yes, describe the duration, time of day and weather conditions:	*Qualitative question		Please provide any additional information regarding your sewage disposal system applicable to the purpose of this study:
1	19	1				Not asked:	16	

Answer:		Answer:		Answer:	
1	no	**1**	—	**1**	—
2	no	**2**	—	**2**	—
3	none	**3**	—	**3**	not asked
4	no	**4**	—	**4**	not asked
5	—	**5**	—	**5**	not asked
6	no	**6**	—	**6**	The drainfield is located on a neighbors property with an easment
7	—	**7**	—	**7**	—
8	No	**8**	—	**8**	not asked
9	no	**9**	—	**9**	not asked
10	none	**10**	—	**10**	not asked
11	NO	**11**	—	**11**	not asked
12	No	**12**	—	**12**	—
13	No	**13**	—	**13**	not asked
14	No	**14**	—	**14**	not asked
15	no	**15**	—	**15**	not asked
16	Yes	**16**	On occasions described above.	**16**	not asked
17	No	**17**	—	**17**	not asked
18	No	**18**	—	**18**	not asked
19	No	**19**	—	**19**	not asked
20	no	**20**	—	**20**	not asked
21	No	**21**	—	**21**	not asked

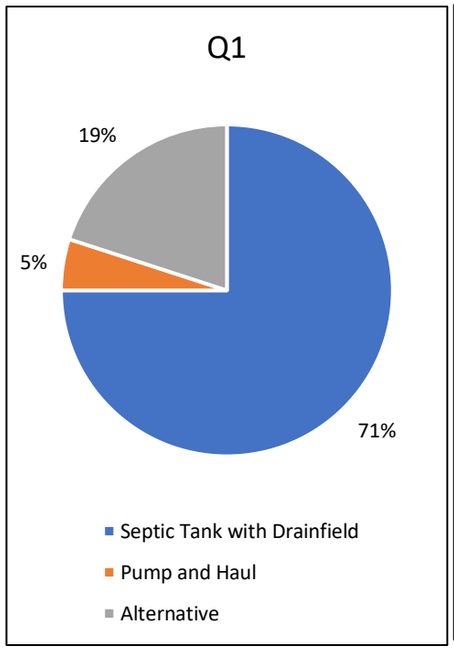
Unison, Sewer Survey

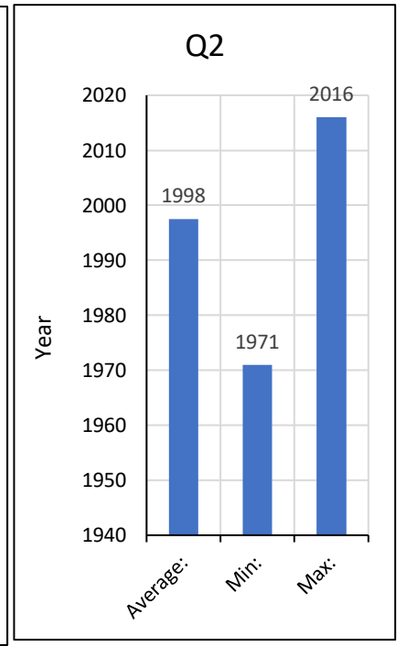
Extra Question from Draft Survey 8		Extra Question from Draft Survey 9		Extra Question from Draft Survey 10	
Yes	No	Yes	No	*Qualitative question	
3	13	6	10	Not asked:	5
Not asked:	5	Not asked:	5		
Is there a service agreement for this system with a vendor or service contractor?		Do you have yearly inspections performed on your sewage disposal system?		Who performs these inspections?	

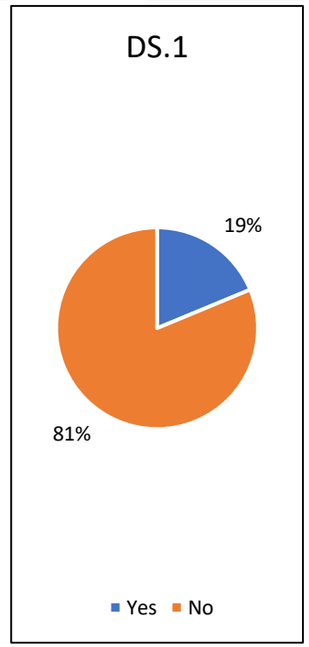
Answer:		Answer:		Answer:	
1	—	**1**	—	**1**	—
2	—	**2**	—	**2**	—
3	no	**3**	No - just when pumped out	**3**	Powels or Loudoun Septic
4	no	**4**	no	**4**	N/A
5	no	**5**	No, just as needed	**5**	Broy and Sons
6	—	**6**	—	**6**	—
7	—	**7**	—	**7**	—
8	No	**8**	Not every year	**8**	Stewarts Septic
9	no	**9**	no	**9**	—
10	no	**10**	yes	**10**	Bill Poindexter
11	NO	**11**	NO	**11**	—
12	—	**12**	—	**12**	—
13	Yes	**13**	Yes	**13**	Stewart's Septic
14	Yes	**14**	Yes	**14**	Powel Plumbing
15	no	**15**	yes	**15**	DTS
16	No	**16**	No	**16**	—
17	No	**17**	Yes	**17**	EcoVirginia - Bill Poindexter
18	No	**18**	No	**18**	—
19	No	**19**	No	**19**	FFL Plumbing when they come out
20	yes	**20**	yes	**20**	—
21	No	**21**	No	**21**	—

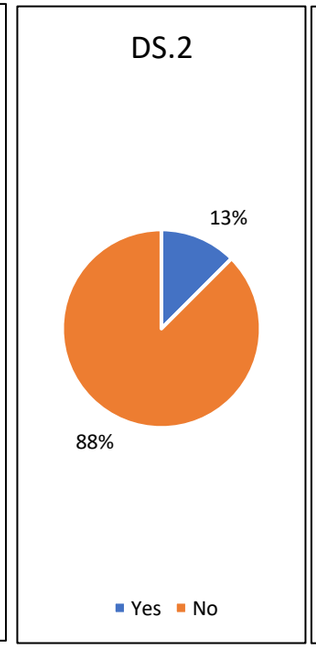
Unison, Sewer Survey – Summary of Quantitative Questions

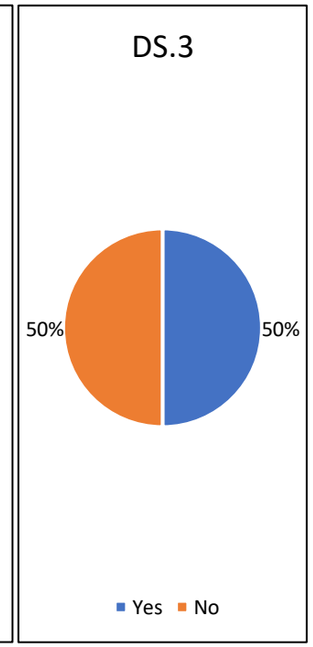
Q1			Q2				Extra Question from Draft Survey 1			Extra Question from Draft Survey 2			Extra Question from Draft Survey 3		
Septic Tank with Drainfield	Pump and Haul	Alternative	Average:	Min:	Max:	N/A or no answer	Yes	No	Not asked:	Yes	No	Not asked:	Yes	No	Not asked:
15	1	4	1998	1971	2016	6	3	13	5	2	14	5	8	8	5
71%	5%	19%					19%	81%		13%	88%		50%	50%	





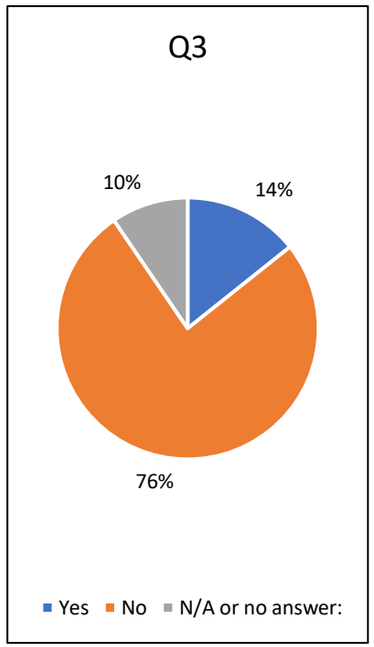


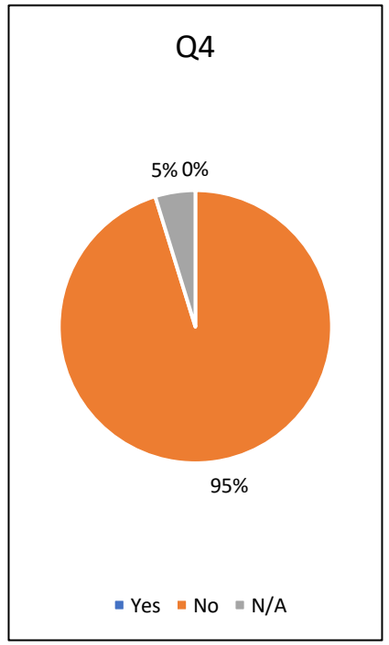


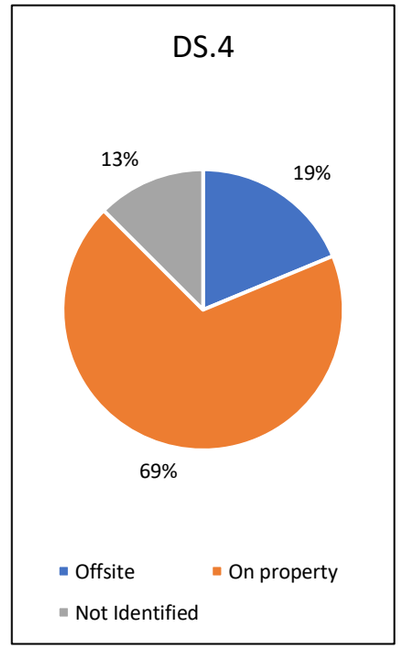


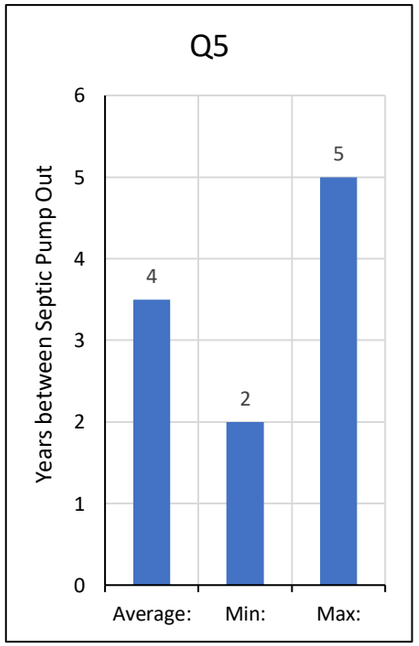
Unison, Sewer Survey – Summary of Quantitative Questions

Q3			Q4			Extra Question from Draft Survey 4				Q5				
Yes	No	N/A or no answer:	Yes	No	N/A	Offsite	On property	Not Identified	Not asked:	Average:	Min:	Max:	N/A:	Not Asked:
3	16	2	0	20	1	3	11	2	5	4	2	5	1	16
14%	76%	10%	0%	95%	5%	19%	69%	13%						



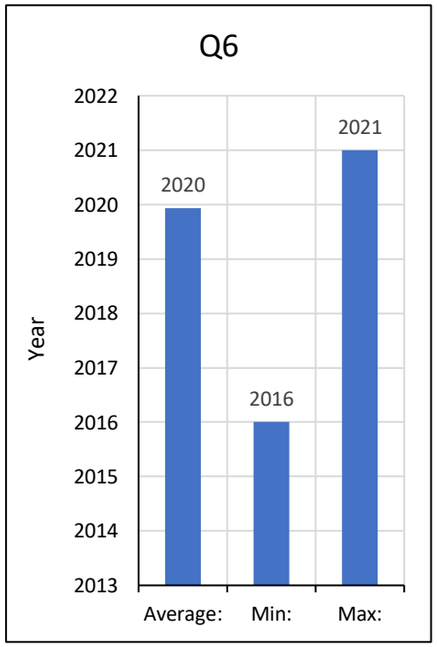


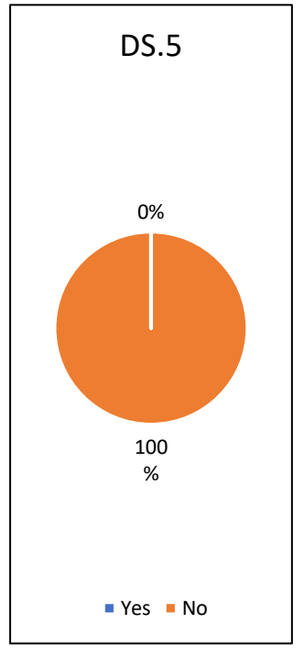


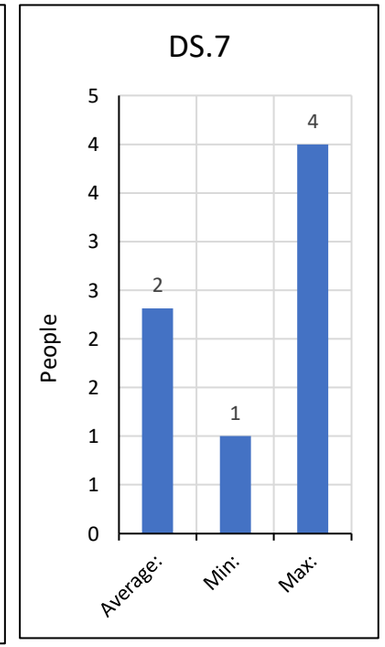


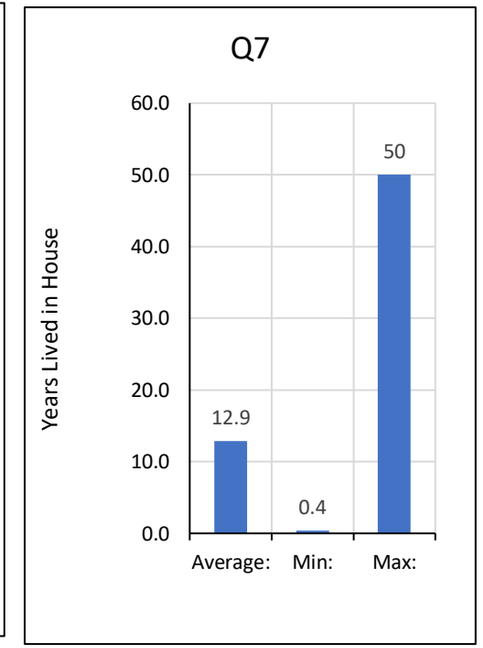
Unison, Sewer Survey – Summary of Quantitative Questions

Q6				Extra Question from Draft Survey 5			Extra Question from Draft Survey 7				Q7			
Average:	Min:	Max:	N/A or no answer:	Yes	No	Not asked:	Average:	Min:	Max:	Not asked:	Average:	Min:	Max:	N/A
2020	2016	2021	3	0	16	5	2	1	4	5	12.9	0.4	50	1
				0%	100%									



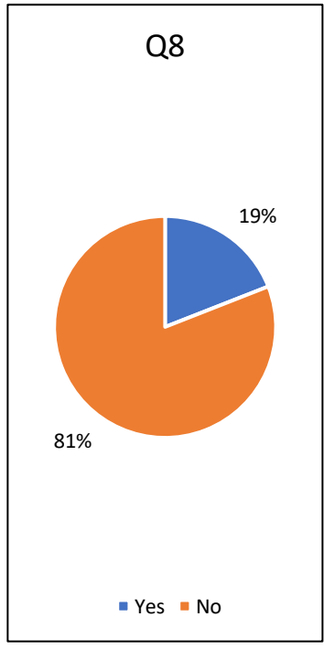


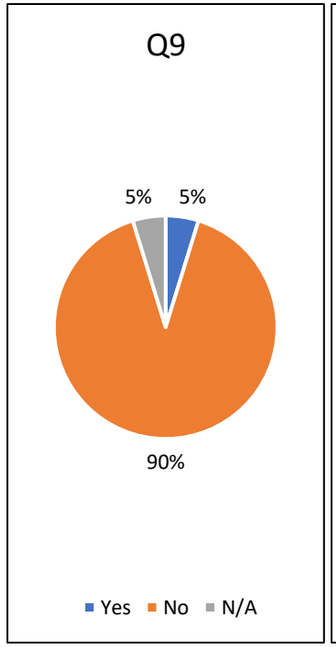


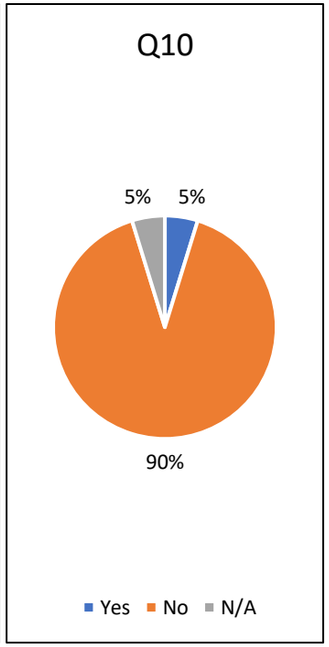


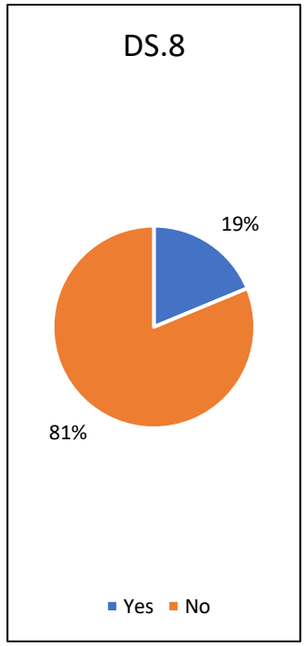
Unison, Sewer Survey – Summary of Quantitative Questions

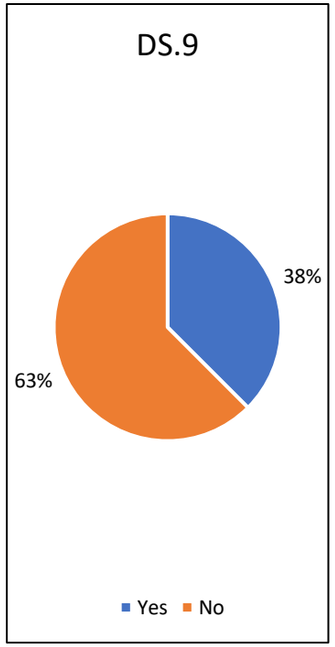
Q8		Q9			Q10			Extra Question from Draft Survey 8			Extra Question from Draft Survey 9		
Yes	No	Yes	No	N/A	Yes	No	N/A	Yes	No	Not asked:	Yes	No	Not asked:
4	17	1	19	1	1	19	1	3	13	5	6	10	5
19%	81%	5%	90%	5%	5%	90%	5%	19%	81%		38%	63%	











Unison, Water Survey

Question 1		How many wells are on your property?	Extra Question from Draft Survey 1		If known, what is the depth of your well(s)?	Extra Question from Draft Survey 2		If known, what is the depth of the pump in your well(s)?	Extra Question from Draft Survey 3		Is the control panel for your pump instide or outside the home?
Average:	2		Average:	563		Average:	416		Inside	Outside	
Min:	1		Min:	28		Min:	200		8	2	
Max:	4		Max:	1000		Max:	900		No answer/yes/no:	6	
			Not asked:	5		Not asked:	5		Not asked:	5	
Answer:			**Answer:**			**Answer:**			**Answer:**		
1	1		**1**	—		**1**	—		**1**	—	
2	2		**2**	—		**2**	—		**2**	—	
3	1		**3**	600		**3**	400		**3**	outside	
4	1		**4**	—		**4**	—		**4**	—	
5	1		**5**	? Broy will know		**5**	? “ “		**5**	In the well	
6	1		**6**	—		**6**	—		**6**	—	
7	1		**7**	—		**7**	—		**7**	—	
8	1		**8**	330		**8**	I believe 280 or 300 feet		**8**	inside	
9	2 hand dug and drilled -abandoned		**9**	580		**9**	460		**9**	inside	
10	2		**10**	unknown		**10**	unkown		**10**	yes	
11	4		**11**	1000, 750, 250 + hand dug		**11**	900, 600, 200		**11**	inside	
12	4		**12**	—		**12**	—		**12**	—	
13	1		**13**	400		**13**	400		**13**	Inside	
14	1		**14**	800		**14**	—		**14**	Yes	
15	2		**15**	400		**15**	1 unknown 1 about 270		**15**	??	
16	2		**16**	450 feet & 28 feet		**16**	420		**16**	O circuit breaker inside	
17	1		**17**	750 feet		**17**	200 feet or more		**17**	Inside	
18	2		**18**	805, 465		**18**	—		**18**	Inside	
19	1		**19**	650		**19**	?		**19**	Yes	
20	1		**20**	600/800		**20**	??		**20**	no	
21	1		**21**	—		**21**	—		**21**	Outside	

Unison, Water Survey

Extra Question from Draft Survey 4		Do you irrigate landscaping, grass or garden?	Extra Question from Draft Survey 5		Do you have a water treament system?	Extra Question from Draft Survey 6		If Yes, please describe the system:	Question 2			How many of these wells are in use (active)?
Yes	No		Yes	No		*Qualitative question			Average:	1	Not Asked:	
7	9		13	3		Not asked:	5		Min:	0	16	
Not asked:	5		Not asked:	5					Max:	2		

Answer:		Answer:		Answer:		Answer:	
1	—	**1**	—	**1**	—	**1**	1
2	—	**2**	—	**2**	—	**2**	1
3	No	**3**	Yes	**3**	Whole house sediment filters	**3**	not asked
4	No	**4**	Yes	**4**	We have a culligan water system. Water tank, salt-brine tank.	**4**	not asked
5	No	**5**	No	**5**	—	**5**	not asked
6	—	**6**	—	**6**	—	**6**	1
7	—	**7**	—	**7**	—	**7**	0
8	no	**8**	yes	**8**	Iron Curtain water purifying system to reduce calcium iron etc installed by Valley Drilling	**8**	not asked
9	yes	**9**	yes	**9**	Water Right AirCat model WR--1054M-ACGSP Iron/Sulphur filter	**9**	not asked
10	small garden	**10**	no	**10**	—	**10**	not asked
11	yes	**11**	yes	**11**	for hard water and rust	**11**	not asked
12	—	**12**	—	**12**	—	**12**	2
13	No	**13**	Yes	**13**	A simple filter system	**13**	not asked
14	No	**14**	Yes	**14**	Closed Tank Aeration System	**14**	not asked
15	not meaningfuly	**15**	yes	**15**	hard water treatment	**15**	not asked
16	some	**16**	N yes	**16**	Particle filter for deep well, UV filter for hand dug well	**16**	not asked
17	No	**17**	Yes	**17**	Basic filter for sediment and UV light for coliform bacteria.	**17**	not asked
18	No	**18**	Yes	**18**	—	**18**	not asked
19	No	**19**	No	**19**	—	**19**	not asked
20	occasionally not often	**20**	yes	**20**	??	**20**	not asked
21	Yes	**21**	Yes	**21**	Water softener and UV system	**21**	not asked

Unison, Water Survey

Question 3			How many of these wells are abandoned (if any)?
Average:	1	Not Asked:	
Min:	0	16	
Max:	2		

Question 4		Why was the well abandoned (dry well, low yield, etc.)?
*Qualitative question	Not Asked:	
	16	

Question 5			Do you supplement your well water supply (cistern, truck in water, etc.)?
Yes	No	Not Asked:	
2	3	16	

Question 6			Has there ever been a problem with the water quantity (yield), quality (bacteria, chemical, odor, etc.)?
Yes	No	N/A	
10	10	1	

Answer:		Answer:		Answer:		Answer:	
1	—	**1**	—	**1**	truck in water, cistern	**1**	no
2	—	**2**	—	**2**	cistern	**2**	no
3	not asked	**3**	not asked	**3**	not asked	**3**	no
4	not asked	**4**	not asked	**4**	not asked	**4**	no
5	not asked	**5**	not asked	**5**	not asked	**5**	Yes
6	—	**6**	—	**6**	no	**6**	Yes
7	0	**7**	—	**7**	no	**7**	—
8	not asked	**8**	not asked	**8**	not asked	**8**	no not to our knowledge
9	not asked	**9**	not asked	**9**	not asked	**9**	YES
10	not asked	**10**	not asked	**10**	not asked	**10**	no
11	not asked	**11**	not asked	**11**	not asked	**11**	always
12	2	**12**	Dry	**12**	No	**12**	Yield
13	not asked	**13**	not asked	**13**	not asked	**13**	Yes
14	not asked	**14**	not asked	**14**	not asked	**14**	No
15	not asked	**15**	not asked	**15**	not asked	**15**	no
16	not asked	**16**	not asked	**16**	not asked	**16**	No
17	not asked	**17**	not asked	**17**	not asked	**17**	Apparently since the UV filter was installed by previous owners.
18	not asked	**18**	not asked	**18**	not asked	**18**	No
19	not asked	**19**	not asked	**19**	not asked	**19**	Yes
20	not asked	**20**	not asked	**20**	not asked	**20**	Yes
21	not asked	**21**	not asked	**21**	not asked	**21**	Yes

Unison, Water Survey

Question 6.1		Question 7				Question 7.1					
*qualitative question	If Yes, please describe the issue(s), when it occurred and how it was resolved:	Average:	2015	Not Asked:	When was the most recent well test completed?	Satisfactory	Unsatisfactory	N/A	No answer:	Not Asked:	Please explain what was tested and the results of the test (satisfactory/ unsatisfactory):
		Min:	2004	16		3	0	1	1	16	
		Max:	2022	Other: 1							
		# Answered:	4								
Answer:		**Answer:**				**Answer:**					
1	—	**1**	2019			**1**	checked well pump				
2	—	**2**	2004			**2**	—				
3	—	**3**	not asked			**3**	not asked				
4	—	**4**	not asked			**4**	not asked				
5	At times the water contains fine silts that settle in the water buckets, dog bowls, etc. We only drink it after filtering (Brita)	**5**	not asked			**5**	not asked				
6	Iron, Egg smell	**6**	2015			**6**	potable, satisfactory				
7	—	**7**	mineral analysis			**7**	satisfactory				
8	—	**8**	not asked			**8**	not asked				
9	iron in water. now solved by WaterRight AirCat filter	**9**	not asked			**9**	not asked				
10	—	**10**	not asked			**10**	not asked				
11	iron bacteria, sulfur	**11**	not asked			**11**	not asked				
12	Well ran dry in December 2021, drilled a new well.	**12**	Jan 2022			**12**	satisfactory				
13	Quantity and quality are constant problems	**13**	not asked			**13**	not asked				
14	—	**14**	not asked			**14**	not asked				
15	—	**15**	not asked			**15**	not asked				
16	—	**16**	not asked			**16**	not asked				
17	No information. Ask the Methodist Church	**17**	not asked			**17**	not asked				
18	—	**18**	not asked			**18**	not asked				
19	We have ran out of water a couple times. We also needed to sanitized the water one time.	**19**	not asked			**19**	not asked				
20	When the well runs dry not bacterial just discolored water	**20**	not asked			**20**	not asked				
21	The water has a heavy iron content.	**21**	not asked			**21**	not asked				

Unison, Water Survey

Question 8				
Yes	No	N/A or Unknown	Not Asked:	Do you experience seasonal fluctuation with well yield?
1	1	3	16	

Question 8.1		
*Qualitative question	Not Asked:	If Yes, please explain:
	16	

Answer:		Answer:	
1	yes	1	Regarding well productivity—winter and spring are generally good. If we have a summer drought, which has been happening often recently, the well stops. We have trucked in water far more in the last three years than in the previous 19 years.
2	no	2	—
3	not asked	3	not asked
4	not asked	4	not asked
5	not asked	5	not asked
6	not sure	6	—
7	—	7	—
8	not asked	8	not asked
9	not asked	9	not asked
10	not asked	10	not asked
11	not asked	11	not asked
12	Don't know yet	12	Have only lived in the house for 6 mos
13	not asked	13	not asked
14	not asked	14	not asked
15	not asked	15	not asked
16	not asked	16	not asked
17	not asked	17	not asked
18	not asked	18	not asked
19	not asked	19	not asked
20	not asked	20	not asked
21	not asked	21	not asked

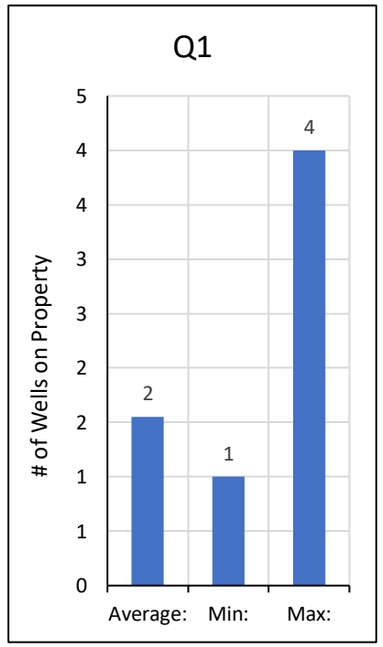
Unison, Water Survey

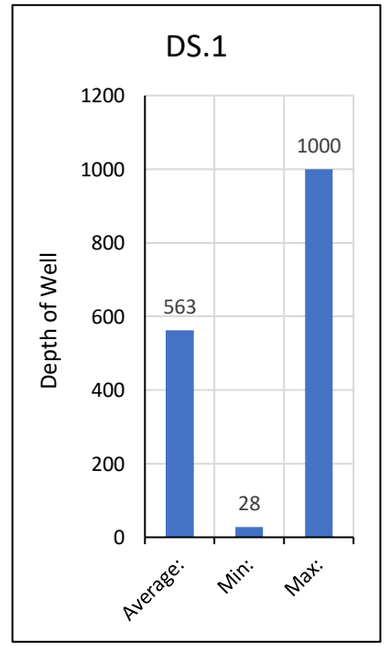
Question 9	
*Qualitative question	Please describe your overall satisfaction with your well water (taste, odor, yield)/any additional water supply information applicable to this study:

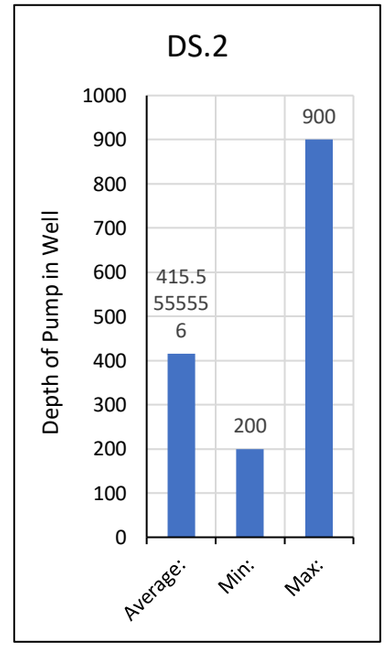
Answer:	
1	quality is good. We also have a UV system to assist with quality.
2	good
3	Good taste no odor unless filters are not changed after a long time. Yield so far adequate.
4	We are satisfied and have no complaints at this time.
5	Overall, it's a good well, with ample supply (we are lucky!)
6	—
7	—
8	tast is ok, no odor, yield as long as you don't waste it.
9	great now with AirCat filter. Approx 3gals/min
10	Our water is great
11	terrible
12	Not satisfied - due to having to redrill new well.
13	Not drinkable. Heavy in minerals/hard water.
14	—
15	a little stinky hot water
16	The water is hard, generally clear unless disturbed by filter change then runs brown until clear.
17	The well has a very low yield of 1.5 gallons per minute therefore I worry about running out of water and am very conservative with water use. I also worry about the overall use of water in Unison and drilling of any new wells that might tap into the same aquifer or deplete the ground water. I do not drink my well water because of the high iron content and the smell. The high levels of iron in the water discolors all that it comes into contact with.
18	Satisfactory taste, no odor, decent yield
19	Would be nice to have public utilities.
20	Need new water. The well only draws about a quart a minute and is easily taxed beyond its limits like all water sources in core of the Unison Village. The Unison Store is one of the reasons this water sewer project is so necessary.
21	If the water were not treated, it would have a reddish tint, which is what occurs at the barn and it leaves a residue.

Unison, Water Survey – Summary of Quantitative Questions

Q1			Extra Question from Draft Survey 1				Extra Question from Draft Survey 2			
Average:	Min:	Max:	Average:	Min:	Max:	Not asked:	Average:	Min:	Max:	Not asked:
2	1	4	563	28	1000	5	415.556	200	900	5

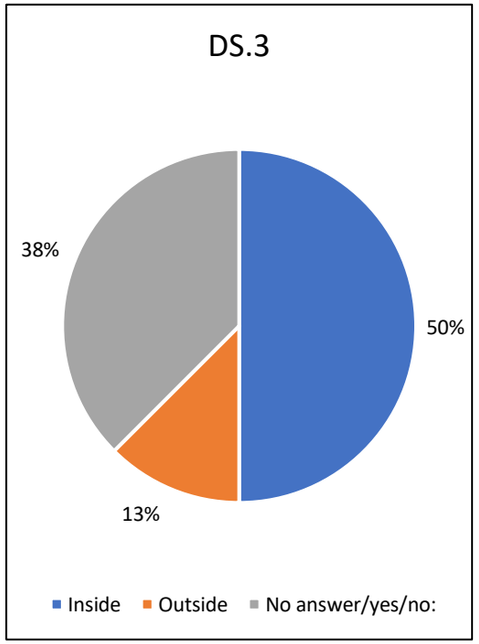


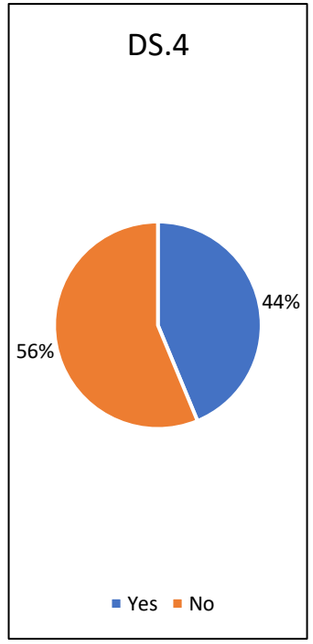


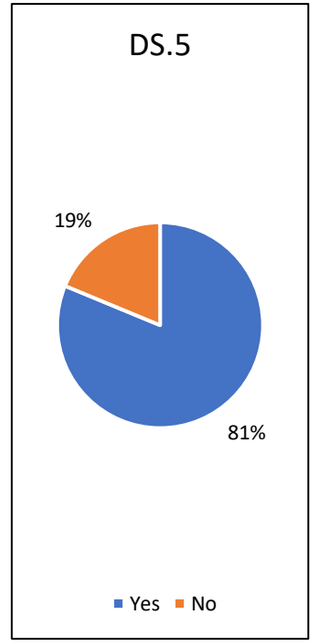


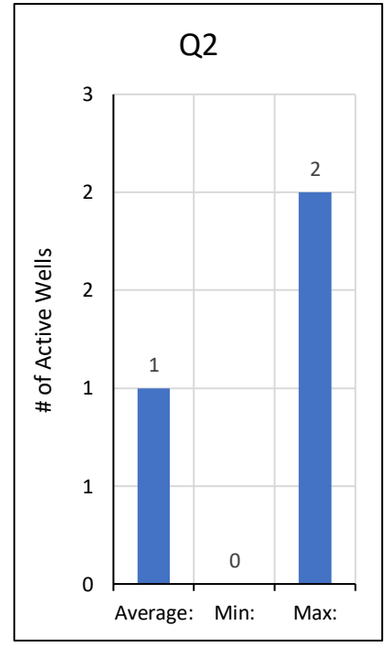
Unison, Water Survey – Summary of Quantitative Questions

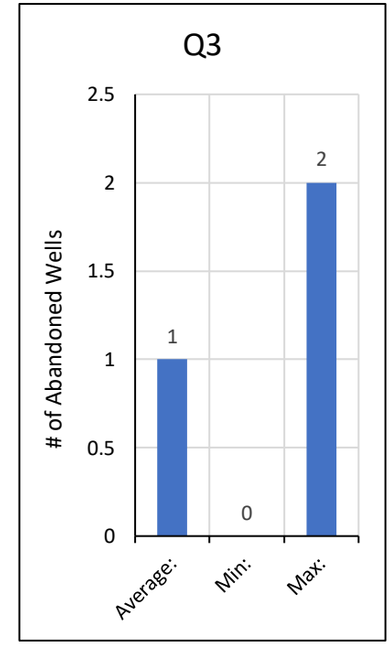
Extra Question from Draft Survey 3				Extra Question from Draft Survey 4			Extra Question from Draft Survey 5			Q2				Q3			
Inside	Outside	No answer/yes/no:	Not asked:	Yes	No	Not asked:	Yes	No	Not asked:	Average:	Min:	Max:	Not Asked:	Average:	Min:	Max:	Not Asked:
8	2	6	5	7	9	5	13	3	5	1	0	2	16	1	0	2	16
50%	13%	38%		44%	56%		81%	19%									





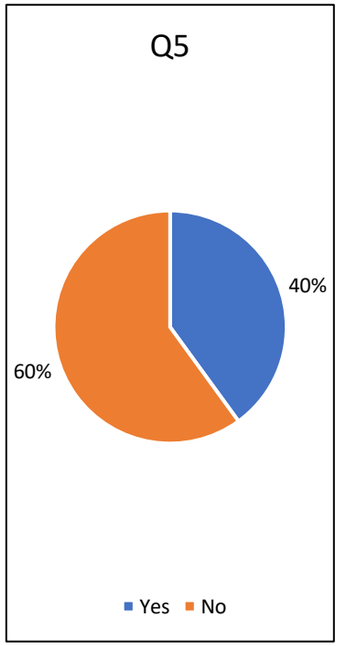


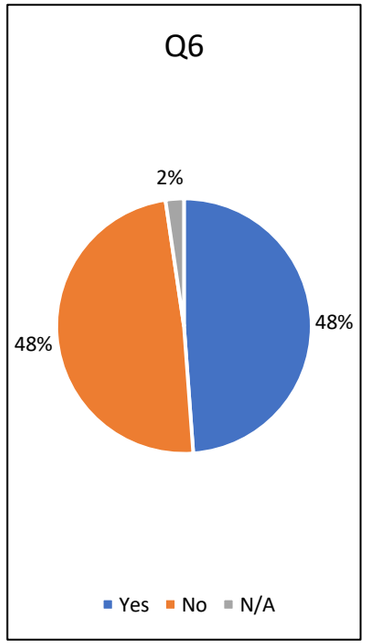


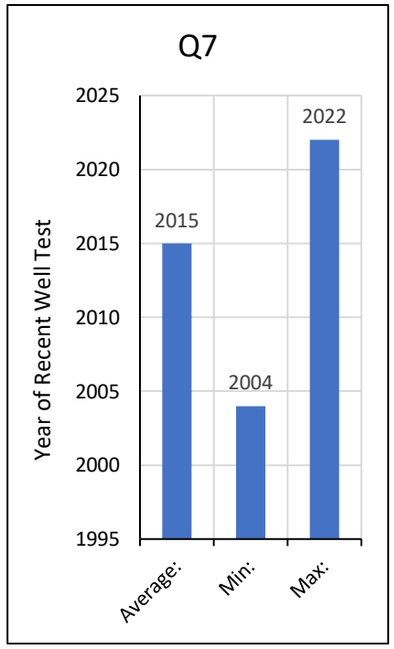


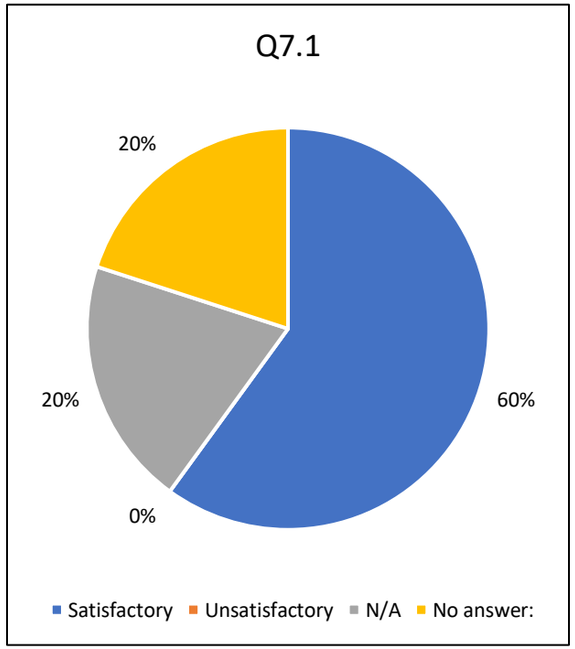
Unison, Water Survey – Summary of Quantitative Questions

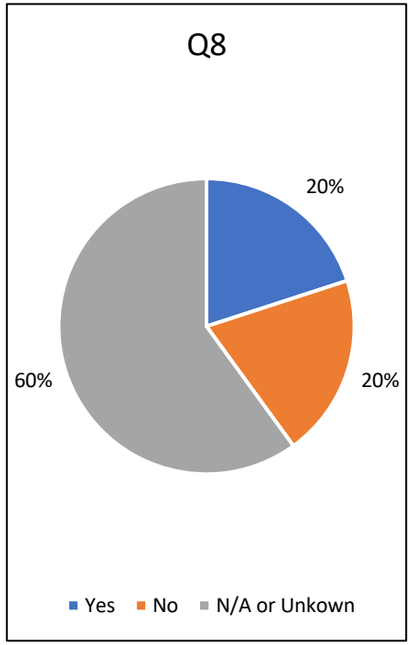
Q5			Q6			Q7				Q7.1					Q8			
Yes	No	Not Asked:	Yes	No	N/A	Average:	Min:	Max:	Not Asked:	Satisfactory	Unsatisfactory	N/A	No answer:	Not Asked:	Yes	No	N/A or Unknown	Not Asked:
2	3	16	10	10	1	2015	2004	2022	16	3	0	1	1	16	1	1	3	16
40%	60%		48%	48%	2%					60%	0%	20%	20%		20%	20%	60%	











Additional Information

Question 1	
*Qualitative question	Please provide any additional information applicable to the purpose of this study:

Answer:	
1	We pay a lot of taxes and until now, have gotten no attention to the Unison water problem that has been known for decades. It is incumbent on the County to help Unison residents finally solve this problem. Current County staff has worked well with us, but any solution other than one that provides the village with consistent water will be unacceptable. Funding in the 2021 Federal Infrastructure bill for water systems, that has been distributed to the state and County, should be a source of support for our issues. Time for action, please.
2	—
3	Old Septic nearing end of useful life. New one doing fine.
4	—
5	—
6	—
7	—
8	—
9	—
10	—
11	we do not drink our water it stinks and is rusty even with all expenses & water treatment siphon
12	—
13	—
14	—
15	—
16	Deep well produces aproximatly 3 quarts per minute, this well supplies all potable water. The handdug well (28') serves the toilets and outside hose used for garden and pottery studio water. Without the supplemental water supply, supply would be inadequate.
17	—
18	—
19	—
20	UNISON Needs this water and sewer program
21	—

Appendix E

Groundwater Hydrology Report

Dewberry

Emery & Garrett
GROUNDWATER INVESTIGATIONS
A Division of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

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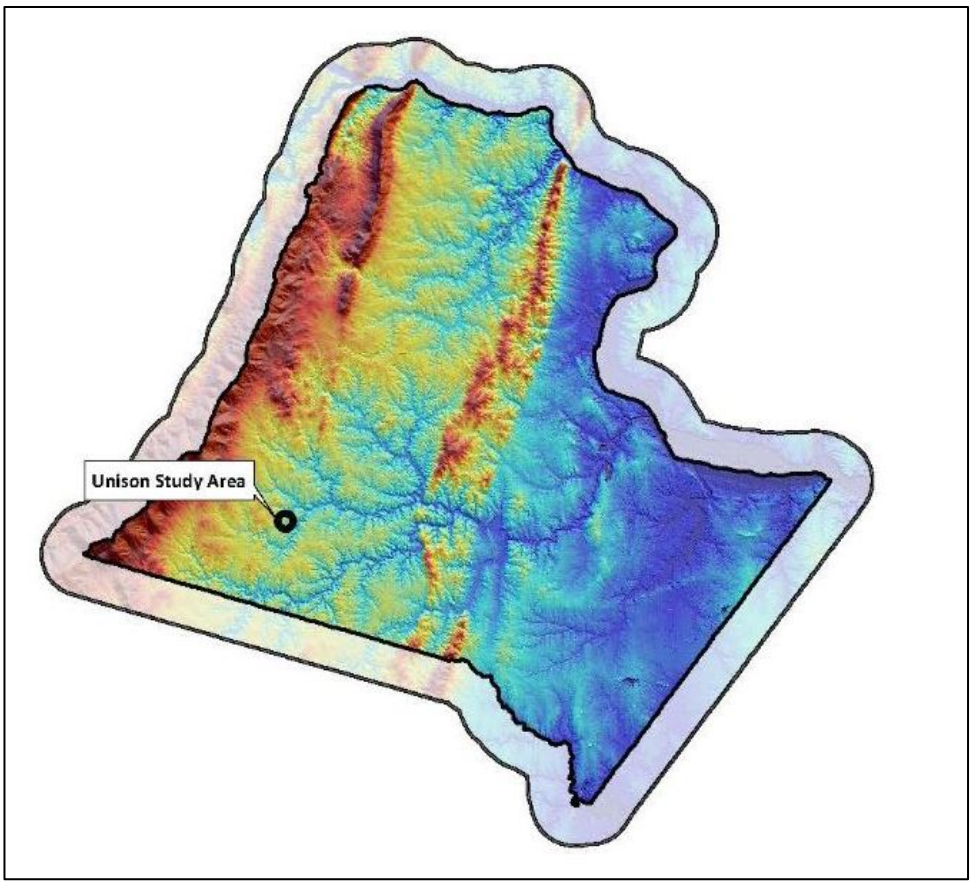
PRELIMINARY HYDROGEOLOGIC SITE ASSESSMENT UNISON PROJECT SITE

LOUDOUN COUNTY, VIRGINIA

February 2, 2022
33.0083181.00



PREPARED FOR:
Randall Flowers, P.E., Senior Project Manager
Dewberry

Emery & Garrett Groundwater Investigations, A Division of GZA
56 Main Street | P.O. Box 1578 | Meredith, New Hampshire 03253
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VIA EMAIL: rflowers@Dewberry.com

February 2, 2022
Project No.: 33.0083181.00

Mr. Randall Flowers, P.E.
Dewberry
Water and Wastewater Division
8401 Arlington Boulevard
Fairfax, VA 22031

Re: Technical Memorandum of Preliminary Hydrogeologic Site Assessment of Unison Project site

Dear Mr. Flowers:

This report provides a brief summary of Emery & Garrett Groundwater Investigations (EGGI), a Division of GZA GeoEnvironmental, Inc. (GZA)'s hydrogeologic assessment of the potential availability of groundwater resources derived from bedrock aquifers underlying the Unison project site in Loudoun County, Virginia (**Figure 1**). Unison is an unincorporated community village that depends upon individual wells and septic drainfields for their water and wastewater treatment. EGGI has been contracted to evaluate the feasibility of developing groundwater resources to serve as a central public drinking water supply for this residential community. This report is subject to the Limitations presented in **Appendix A**.

The Unison project site encompasses approximately 288 acres and is roughly defined as a circle with a 2,000-foot radius centered near the center of the village **(Figure 1)**. The Unison project site consists of approximately 30 residential lots that range in size from 0.20 acres to 97 acres and average 11 acres. In accordance with Loudoun Water guidelines, it is necessary to develop 1.2 gpm per residential connection or 36 gallons per minute. In contrast, Loudoun County requires that one gallon per minute per residential connection (30 gpm) be developed and the Virginia Water Works Regulations require only 0.5 gpm per residential connection (15 gpm) be developed when constructing a community water system.

The results of the work conducted to date are summarized below and are presented on the accompanying figure. The data analyzed and evaluations performed included:

- A remote sensing analysis of high and low altitude photography and imagery;
- An assessment of the local bedrock geology through the compilation of existing geologic maps;
- A groundwater recharge analysis;

- A review of potential contaminant threats to groundwater quality; and
- A compilation of available existing well data.

Remote Sensing Analysis

A remote sensing analysis was conducted using available imagery, topographic maps, and digital elevation models (DEMs) to help characterize potential structural discontinuities that may underlie the Unison project site. Many water-bearing subsurface features, such as fracture zones, bedrock discontinuities, faults, and geologic contacts, have a ground surface expression that can be detected through remote sensing analyses of photographic images and topographic maps. These surface expressions typically appear on the ground surface as topographic linear features, vegetation changes or tonal anomalies (i.e., contrast changes), and are known as lineaments. A lineament can be loosely defined as a mappable linear feature, as seen on the terrain surface, whose parts are aligned in a rectilinear or curvilinear manner.

A total of 505 lineaments were identified in this investigation. Lineaments were defined on three scales of platforms **(Table 1 on Plate 1)**. Each lineament was described by its length, azimuth (trend in degrees east of north), and location.

A synoptic rose diagram[1] was created as part of this analysis, which shows the prominent trends of lineaments observed within 1.5 kilometers of the Unison project site **(Plate 1)**. The most common trends identified by the rose diagram are 1°, 21°, 44°, and 133°. Subordinate trends also occur at 60°, 88°, and 164°. Note, however, that lineaments trending at orientations other than those shown on the rose diagram do occur locally, as shown on the map **(Plate 1, View A)**.

From the original 505 lineaments, 51 coincident lineaments[2] were identified **(Plate 1, View A)**. Since discontinuities in the bedrock that possess enhanced water-bearing properties often underlie coincident lineaments, the lineaments helped EGGI identify the proposed groundwater development zones/areas and locations where geophysical surveys should be performed. (These geophysical data will ultimately determine where the best locations exist for drilling exploratory wells, if such targets exist.)

Bedrock Geology

Existing geologic maps (**Southworth and others, 1999**), indicate that the bedrock beneath the Unison project site is made up of three different rock units: a Pink metagranite (Yml), Layered granitic gneiss (Ylg), and Metabasalt dikes (Zmd) **(Plate 1, View B).**

The Pink metagranite underlies the central and eastern portion the project site. The Layered granitic gneiss is located northwestern portion of the project site. These rock units are separated by the Short-Hill Fault which is interpreted to be a low angle thrust fault (**Southworth, 1994**). Both rock units are intruded by metadiabase dikes

[1] A rose diagram is illustrated on **Plate 1** and shows the orientations of lineament data. The trend of each rose petal represents lineament orientations posted in degrees east of north. Petal width is a measure of lineament data scatter and petal length is a measure of relative numbers of data in each lineament family.

[2] Lineaments observed on images at different scales that have a similar trend (±5°) and similar location (±2 mm at the scale of the image) are referred to as coincident lineaments (**Mabee, and others, 1994)**. The use of such coincident lineaments helps to remove the inherent subjectivity of lineament analysis (**Wise, 1982**) and facilitates the confident use of lineament mapping as a groundwater exploration tool.

(Zmd) (**Plate 1, View B**). The foliation[3] and compositional layering in all these rocks all trend to the north-northeast and dip to the southeast at moderate angles.

Preliminary Groundwater Recharge Review

Estimates of groundwater recharge in northern Virginia and Maryland have ranged from 8.4 inches per year (**Pavich, 1986**), to 10.5 inches per year (**Richardson, 1980**), to 11.3 inches per year (**Nutter and Otton, 1969**). For the purposes of this study, EGGI applied an average recharge value of ten inches per year to estimate available recharge within the project site.

A recharge value of ten inches per year is equivalent to approximately 477,000 gallons per day per square mile. The project site covers an area of approximately 0.45 square miles. Therefore, a minimum of 214,650gpd (149 gpm) of groundwater recharge is potentially available from the Unison project site.[4] This amount groundwater recharge is more than sufficient to support the required production capacity for Unison. However, the actual amount of groundwater recharge received by the local bedrock aquifer and the extent of pumping impacts will need to be determined through the hydrologic testing (pumping tests) of potential production wells.

Preliminary Review of Potential Contaminant Threats to Groundwater Quality

The quality of groundwater resources can be adversely affected by land uses that allow groundwater contaminants to migrate into underlying bedrock aquifers. Therefore, one element of this groundwater resource investigation was to review the presence of potential contaminant threats to groundwater quality. This survey was carried out to a distance of 4,000 feet from the center of Unison **(Plate 1, View C)**. The sources used to investigate potential threats to groundwater quality included Environmental Data Resources (EDR) of Southport, Connecticut (a private firm that conducts contaminant threat searches) **(Appendix B)** and a review of Loudoun County GIS data on the location of existing drainfields, chemical storage tanks and other potential contaminants.

EDR identified only two specific sites within the boundaries of Unison project study area not including the individual septic drainfields which also can serve as potential sources of groundwater contamination **(Plate 1, View C).**

Loudoun County GIS data identified numerous drainfields and one chemical storage tank **(Plate 1, View C)**. In areas with small lot sizes, nitrate leaching from closely-spaced drainfields can cause elevated nitrate concentration in the groundwater.

As the exploration process moves forward and potential test well drilling targets are selected, consideration will be given to the proximity of the potential groundwater contamination to any potential new source of water for the Unison.

Existing Wells

Homes and business within the Unison project site are served by groundwater from individual wells. Well records compiled from the Loudoun County GIS database within 4,000 feet of the project site are shown on **Plate 1, View**

[3] Foliation is the parallel alignment of minerals developed during the metamorphism and deformation of the rocks.

[4] This is considered a rough estimate only, as topography, vegetation, soil type, slope, the amount impermeable surfaces, and geomorphology of the landscape all impact recharge rates.

C. Reported airlift yields from the GIS wells range from 0.5 to 50 gpm and the well depths range from 100 to 1,000 feet (**Table 2 on Plate 1**). The average yield of the wells is 8.4 gpm and their average depth is 525 feet, respectively.

Overall, these data show that bedrock wells in the local area are deep and have very low to moderate yields. EGGI believes it will be essential to conduct geophysical surveys within the selected favorable areas to specifically identify where new groundwater supplies may be able to be developed in a sustainable manner.

Recommendations / Conclusions

The hydrogeologic assessment of the Unison project site has served to identify three potential Groundwater Development Zones identified as UNI-1, UNI-2, and UNI-3. These Zones are considered the best candidate areas for developing potable groundwater resources proximal to Unison. These areas are priority ranked according to their overall hydrogeological favorability for yielding appreciable groundwater resources. Therefore, UNI-1 is considered more favorable for groundwater development than UNI-3.

Based upon the hydrogeologic data collected in Phase I, EGGI strongly recommends that this groundwater exploration program proceed to Phase II. Phase II will include conducting geophysical surveys within the selected Groundwater Development Zones to aid in the selection of specific exploratory test well drilling targets/sites. The geophysical surveys (Phase II) will be conducted in two parts for this project. Magnetometer/VLF surveys initially will be conducted to obtain additional insights into the geology underlying the property. Electrical resistivity surveys will then be conducted in order to locate site specific proposed exploratory test well targets.

The geophysical surveys should be conducted on selected land parcels where permission to gain access onto private or public property can be obtained and where it is technically feasible to conduct the surveys.[5] EGGI has successfully obtained permission for thousands of landowners over the years to conduct such geophysical investigations, subsequently resulting in drilling test wells, and would be happy to assist in this matter. Conducting Phase II investigations will result in the following:

- Identification of specific exploratory test well drilling sites.
- Provide a relative favorability "priority" ranking of the proposed exploratory test well drilling targets in all Zones;
- Provide additional estimates of potential groundwater yield; and
- Provide a recommended drilling order for the subsequent Phase III, exploratory test well drilling program.

Should Phase II serve to identify favorable drilling targets, the following work phases will then need to be carried out.

Phase III Exploratory Test Well Drilling and Testing – An appropriate number of exploratory test wells well be drilled at those locations defined in Phases I and II

[5] Geophysical surveys can be conducted where access permission is granted and where parcel size is sufficient to allow geophysical surveys. Furthermore, because public supply wells have specific sanitary setback requirements, some land parcels may need to be combined to obtain sufficient setbacks from property boundaries.

Phase IV Production Well Drilling -- Convert the Highest Yielding Exploratory Test Wells to Large-Diameter Production Well(s)

Phase V Conduct Long-Term Pumping Tests on Highest Yielding Production Well(s)

Determination of long-term safe yield and quality of developed groundwater resources. Determination of off-site impacts to local homeowners (if any). Assessment of impact to the local water table and environment.

Phase VI Preparation of Final Hydrogeological Report – Submittal to Loudoun Water, Loudoun County Department of Building, and Development and Virginia Department of Health

The hydrogeologic data collected from the pumping test(s) will be analyzed and a final report will be prepared. The report will include all pertinent pumping test information and provide estimates for the long-term sustainable yield of each well. The report would also provide a Groundwater Use Management Plan with recommendations on how to utilize the well(s) in the most effective manner to meet community potable water supply needs. Once these submittals are reviewed and approved, the Proposed Project can proceed to complete engineering design and construction of the water supply infrastructure.

We hope you find the information contained within this report to be responsive to your needs. If you have any questions, please do not hesitate to contact us.

Best regards,

EMERY & GARRETT GROUNDWATER INVESTIGATIONS, A DIVISION OF GZA

Mark B. Wingsted, P.G.
Project Manager/Senior Hydrogeologist

James M. Emery, P.G.
Principal/District Office Manager
Senior Hydrogeologist

COMMONWEALTH OF VIRGINIA
MARK B WINGSTED
No. 2801002055
CERTIFIED PROFESSIONAL GEOLOGIST

COMMONWEALTH OF VIRGINIA
JAMES M EMERY
No. 2801002057
CERTIFIED PROFESSIONAL GEOLOGIST

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Enclosures:

Figure 1	Topographic Setting of the Study Area
Plate 1	Bedrock Geology, Lineaments, Existing Wells, and Potential Threats to Groundwater Quality
Appendix A	Limitations
Appendix B	Environmental Data Resources, Inc. (EDR) Report

References:

Mabee, S.B., Hardcastle, K.C., and Wise, D.U., 1994, A Method of Collecting and Analyzing Lineaments for Regional-Scale Fractured-Bedrock Aquifer Studies, *Ground Water,* Vol. 21, No. 6, 884-894.

Nutter, L.J., Otton, E.G., 1969, Ground-Water Occurrence in the Maryland Piedmont, Maryland Geological Survey, Report of Investigations No. 10.

Pavich, M.J., 1986, Processes and Rates of Saprolite Production and Erosion on a Foliated Granitic Rock in the Virginia Piedmont: in Colman, S.M. and Dethier, D.P., eds, Rates of Chemical Weathering of Rocks and Minerals: Academic Press, Inc., New York, p. 541-591.

Southworth, S., 1994, Geologic Map of the Bluemont Quadrangle, Loudoun and Clarke Counties, Virginia, USGS GQ-1739.

Southworth, S., Burton, W.C., Schindler, J.S., and Froelich, A.J., 1999, Digital Geologic Map of Loudoun County, Virginia, USGS Open-File Report 99-150.

Richardson, C.A., 1980, Groundwater in the Piedmont Upland of Central Maryland: U.S. Geol. Survey, Water Res. Invest. 80-118.

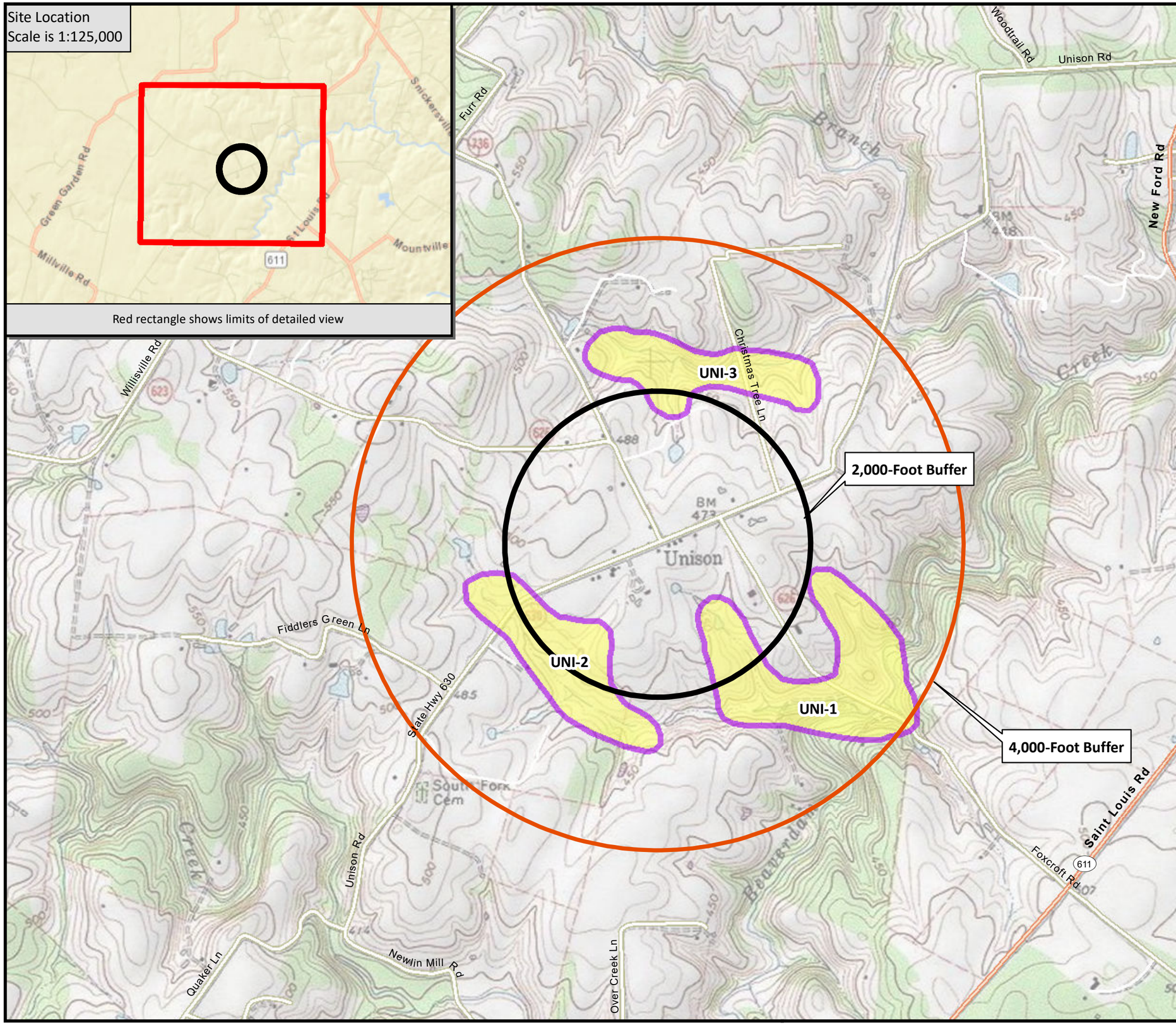
Wise; D. U., 1982, Linesmanship and the Practice of Linear Geo-art, Geol. Soc. Amer. Bull; 9; 886-888.

Figure

FIGURE 1

Topographic Setting of the
Unison Project Site
Loudoun County, Virginia

Preliminary Hydrogeologic Assessment



Legend

Unison Project Site

Potential Groundwater Development Zones

N

Scale is 1:15,000

1 inch = 1,250 feet

0 150 300 600 Meters

0 625 1,250 2,500 Feet

FIGURE 1

Emery & Garrett

Groundwater Investigations, A Division of GZA

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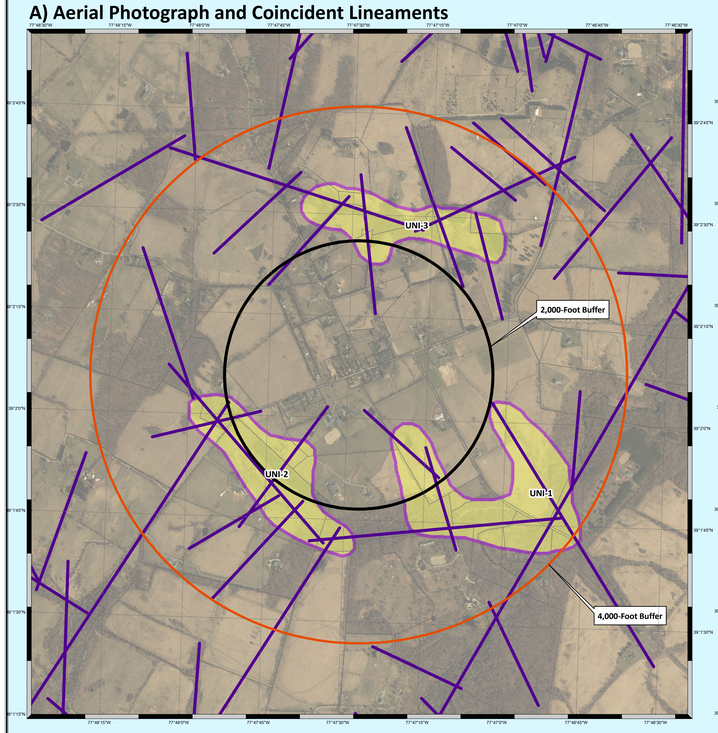
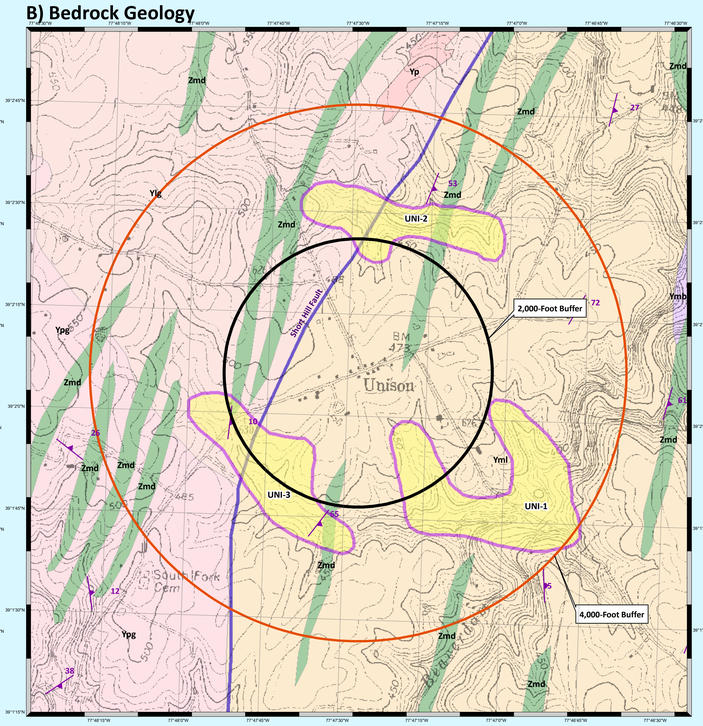
Plate

RESULTS of the HYDROGEOLOGIC INVESTIGATION FOR UNISON, LOUDOUN COUNTY, VIRGINIA

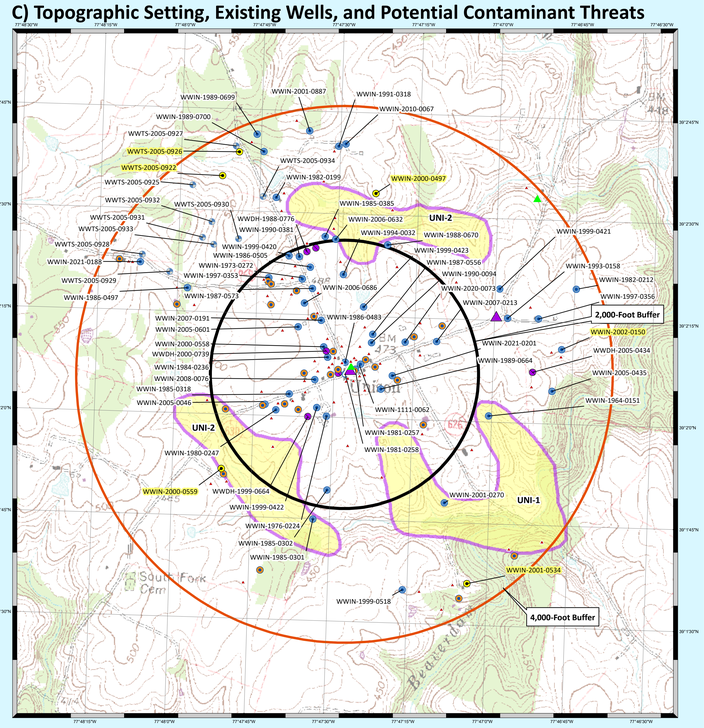
A) Aerial Photograph and Coincident Lineaments



B) Bedrock Geology



C) Topographic Setting, Existing Wells, and Potential Contaminant Threats



Legend - View A

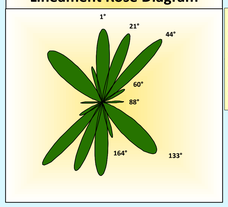
Coincident Lineaments

- Observed on more than three scales of imagery. (trend is posted in degrees east of north)
- Unison Project Site

Potential Groundwater Development Zones

- Primary Zone

Lineament Rose Diagram



ROSE DIAGRAM NOTATION - Rose petals represent trends of fractures derived by fitting gaussian curves to azimuth frequency histograms. Mean dip is posted parenthetically. The trend of each peak is posted in degrees east of north. Petal width is a measure of data scatter and petal length a measure of relative numbers of data in each fracture family.

Legend - View B

- Unison Project Site
- Strike and Dip of Foliation
- Faults

Bedrock Units

- Biotitic Marshall metagranite
- Layered granitic gneiss
- Metadiabase dike
- Paragneiss Metagranite
- Pink leucocratic metagranite
- Porphyroblastic metagranite

Legend - View C

- Loudoun County Drainfield
- Chemical Storage Tank
- Potential Contaminant Threat Identified by EDR
- Wells that yield at least 20 gpm
- Individual Water Well -no data available
- Dry Hole Well
- Individual Water Well
- Test Well

TABLE 1 - LINEAMENT PLATFORMS EVALUATED

Scale	Image Id (Name / Roll / Frame)	Image Type	Number of Observational Trials	Total Number of Lineaments Observed
1:12,000	3m Digital Elevation Model	Digital Elevation Model	2	300
1:20,000	Lidar	Digital Elevation Model	2	124
1:58,000	Landsat	Satellite Image	2	81
		TOTALS:	6	505

Table 2 - Well Data from Loudoun County GIS Database - only those wells with data tabulated in table*

WellSite ID	Well Type	Well Depth (Feet)	Well Yield (GPM)	WellSite ID	Well Type	Well Depth (Feet)	Well Yield (GPM)	WellSite ID	Well Type	Well Depth (Feet)	Well Yield (GPM)
WWDH-1977-0275	Dry Hole	740		WWIN-1988-0670	Individual Water Well	495		WWIN-2005-0601	Individual Water Well	800	1
WWDH-1988-0776	Dry Hole	600		WWIN-1989-0664	Individual Water Well	580		WWIN-2006-0632	Individual Water Well	630	1
WWDH-1999-0664	Dry Hole	1000	0.5	WWIN-1989-0699	Individual Water Well	325		WWIN-2006-0686	Individual Water Well	700	1
WWDH-2000-0739	Dry Hole	620		WWIN-1989-0700	Individual Water Well	145		WWIN-2007-0191	Individual Water Well	800	
WWDH-2005-0434	Dry Hole	800		WWIN-1990-0094	Individual Water Well	445		WWIN-2007-0213	Individual Water Well	500	
WWDH-2006-0310	Dry Hole	600		WWIN-1990-0381	Individual Water Well	300		WWIN-2008-0076	Individual Water Well	540	5
WWIN-1111-0062	Individual Water Well	800	2.5	WWIN-1991-0318	Individual Water Well	300		WWIN-2010-0067	Individual Water Well	220	14
WWIN-1964-0151	Individual Water Well	180		WWIN-1993-0158	Individual Water Well	400		WWIN-2020-0073	Individual Water Well	540	5
WWIN-1973-0272	Individual Water Well	360		WWIN-1994-0032	Individual Water Well	560		WWIN-2021-0188	Individual Water Well	500	6
WWIN-1976-0224	Individual Water Well	300		WWIN-1997-0353	Individual Water Well	360	9	WWIN-2021-0201	Individual Water Well	740	1
WWIN-1980-0247	Individual Water Well	310		WWIN-1997-0356	Individual Water Well	360	10	WWTS-2005-0922	Test Well	260	20
WWIN-1981-0257	Individual Water Well	600		WWIN-1999-0420	Individual Water Well	680	7	WWTS-2005-0925	Test Well	420	15
WWIN-1981-0258	Individual Water Well	560		WWIN-1999-0421	Individual Water Well	600	5	WWTS-2005-0926	Test Well	200	20
WWIN-1982-0199	Individual Water Well	100		WWIN-1999-0422	Individual Water Well	700	1.5	WWTS-2005-0927	Test Well	500	5
WWIN-1982-0212	Individual Water Well	440	15	WWIN-1999-0423	Individual Water Well	720	2	WWTS-2005-0928	Test Well	700	2.5
WWIN-1984-0236	Individual Water Well	325		WWIN-1999-0518	Individual Water Well	600	5	WWTS-2005-0929	Test Well	800	1
WWIN-1985-0385	Individual Water Well	550		WWIN-2000-0558	Individual Water Well	360	1	WWTS-2005-0930	Test Well	800	1
WWIN-1985-0301	Individual Water Well	605		WWIN-2000-0559	Individual Water Well	300	20	WWTS-2005-0931	Test Well	900	1
WWIN-1985-0302	Individual Water Well	445		WWIN-2000-0497	Individual Water Well	175	50	WWTS-2005-0932	Test Well	800	5
WWIN-1985-0318	Individual Water Well	510		WWIN-2001-0270	Individual Water Well	500	10	WWTS-2005-0933	Test Well	500	5
WWIN-1986-0483	Individual Water Well	1000		WWIN-2001-0534	Individual Water Well	700	20	WWTS-2005-0934	Test Well	300	11
WWIN-1986-0497	Individual Water Well	445		WWIN-2001-0887	Individual Water Well	250	15	* Wells yielding 20 gpm or more are highlighted			
WWIN-1986-0505	Individual Water Well	600		WWIN-2002-0150	Individual Water Well	340	20	Minimum =		100	0.5
WWIN-1987-0556	Individual Water Well	805		WWIN-2005-0046	Individual Water Well	500	0.5	Maximum =		1000	50
WWIN-1987-0573	Individual Water Well	660		WWIN-2005-0435	Individual Water Well	420	10	Average =		525	8.4

0 700 1,400 2,800 Feet

0 165 330 660 Meters

1:9,600
1 inch = 800 feet

USGS Topographic quadrangle map base.
UTM Zone 18N, NAD 83, meters.
Topographic contours interval: 10 feet.

PLATE 1
HYDROGEOLOGIC INVESTIGATION RESULTS for Unison, Loudoun County, Virginia

BEDROCK GEOLOGY, LINEAMENTS, EXISTING WELLS, and POTENTIAL THREATS to GROUNDWATER QUALITY

Emery & Garrett Groundwater Investigations, A Division of GZA
Groundwater Exploration, Development, and Protection
Northeast Mid Atlantic South Atlantic

February 2022 J:\33.0083\00 to 33.0083\00.33.0083\01.00 UNI\Work\GIS\Unison_Plate_1.mxd (last modified 2/2/2022) 33.0083083

Appendix A - Limitations

USE OF REPORT

1. Emery & Garrett Groundwater Investigations (EGGI), a Division of GZA GeoEnvironmental, Inc. (GZA) (hereafter referenced as GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Proposal for Services and/or Report and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).

3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made. Specifically, GZA does not and cannot represent that the Site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during its study. Additionally, GZA makes no warranty that any response action or recommended action will achieve all of its objectives or that the findings of this study will be upheld by a local, state or federal agency.

4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

COMPLIANCE WITH CODES AND REGULATIONS

5. We used reasonable care in identifying and interpreting applicable codes and regulations necessary to execute our scope of work. These codes and regulations are subject to various, and possibly contradictory, interpretations. Interpretations and compliance with codes and regulations by other parties is beyond our control.

INTERPRETATION OF DATA

6. Our opinions are based on available information as described in the Report, and on our professional judgment. Additional observations made over time, and/or space, may not support the opinions provided in the Report.

ADDITIONAL INFORMATION

7. In the event that the Client or others authorized to use this report obtain additional information on environmental or hazardous waste issues in the Study Area that are not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this report.

ADDITIONAL SERVICES

8. GZA recommends that we be retained to provide services during any future groundwater investigations, including drilling supervision, pumping tests, and/or evaluation of sustainable yields of the well sites we have recommended for drilling. This will allow us the opportunity to: i) observe conditions and compliance with our exploration methods and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our recommendations; and iv) assess the overall results of this groundwater development program.

Appendix B – Environmental Data Resources, Inc. (EDR) Report

Unison Study Area
20985 Unison Road
Middleburg, VA 20117

Inquiry Number: 6831014.2s
January 24, 2022

The EDR Radius Map™ Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

GEOCHECK ADDENDUM

GeoCheck - Not Requested

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E1527-21), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

20985 UNISON ROAD
MIDDLEBURG, VA 20117

COORDINATES

Latitude (North):	39.0348600 - 39ˆ 2' 5.49''
Longitude (West):	77.7911950 - 77ˆ 47' 28.30''
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	258398.0
UTM Y (Meters):	4324145.0
Elevation:	481 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	13862047 BLUEMONT, VA
Version Date:	2019

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140816
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
20985 UNISON ROAD
MIDDLEBURG, VA 20117

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	UNISON STORE	21081 UNISON ROAD	LUST	Lower	71, 0.013, NE
2	P F HANSEN TESTAMENT	20836 UNISON RD	LTANKS	Lower	2289, 0.434, ENE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

Lists of Federal Delisted NPL sites

Delisted NPL ..... National Priority List Deletions

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY ..... Federal Facility Site Information listing
SEMS ..... Superfund Enterprise Management System

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE ..... Superfund Enterprise Management System Archive

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS ..... Corrective Action Report

Lists of Federal RCRA TSD facilities

RCRA-TSDF ..... RCRA - Treatment, Storage and Disposal

Lists of Federal RCRA generators

RCRA-LQG ..... RCRA - Large Quantity Generators
RCRA-SQG ..... RCRA - Small Quantity Generators
RCRA-VSQG ..... RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ..... Land Use Control Information System

EXECUTIVE SUMMARY

US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROLS..... Institutional Controls Sites List

Federal ERNS list

ERNS..... Emergency Response Notification System

Lists of state- and tribal hazardous waste facilities

SHWS..... This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF..... Solid Waste Management Facilities

Lists of state and tribal leaking storage tanks

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

Lists of state and tribal registered storage tanks

FEMA UST..... Underground Storage Tank Listing
UST..... Registered Petroleum Storage Tanks
AST..... Registered Petroleum Storage Tanks
INDIAN UST..... Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

ENG CONTROLS..... Engineering Controls Sites Listing
INST CONTROL..... Voluntary Remediation Program Database

Lists of state and tribal voluntary cleanup sites

INDIAN VCP..... Voluntary Cleanup Priority Listing
VCP..... Voluntary Remediation Program

Lists of state and tribal brownfield sites

BROWNFIELDS..... Brownfields Site Specific Assessments

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands
ODI..... Open Dump Inventory
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL..... Delisted National Clandestine Laboratory Register

EXECUTIVE SUMMARY

US CDL ..... National Clandestine Laboratory Register

Local Land Records

LIENS 2 ..... CERCLA Lien Information

Records of Emergency Release Reports

HMIRS ..... Hazardous Materials Information Reporting System
SPILLS ..... Prep/Spills Database Listing
SPILLS 90 ..... SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR ..... RCRA - Non Generators / No Longer Regulated
FUDS ..... Formerly Used Defense Sites
DOD ..... Department of Defense Sites
SCRD DRYCLEANERS ..... State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ..... Financial Assurance Information
EPA WATCH LIST ..... EPA WATCH LIST
2020 COR ACTION ..... 2020 Corrective Action Program List
TSCA ..... Toxic Substances Control Act
TRIS ..... Toxic Chemical Release Inventory System
SSTS ..... Section 7 Tracking Systems
ROD ..... Records Of Decision
RMP ..... Risk Management Plans
RAATS ..... RCRA Administrative Action Tracking System
PRP ..... Potentially Responsible Parties
PADS ..... PCB Activity Database System
ICIS ..... Integrated Compliance Information System
FTTS ..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ..... Material Licensing Tracking System
COAL ASH DOE ..... Steam-Electric Plant Operation Data
COAL ASH EPA ..... Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ..... PCB Transformer Registration Database
RADINFO ..... Radiation Information Database
HIST FTTS ..... FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ..... Incident and Accident Data
CONSENT ..... Superfund (CERCLA) Consent Decrees
INDIAN RESERV ..... Indian Reservations
FUSRAP ..... Formerly Utilized Sites Remedial Action Program
UMTRA ..... Uranium Mill Tailings Sites
LEAD SMELTERS ..... Lead Smelter Sites
US AIRS ..... Aerometric Information Retrieval System Facility Subsystem
US MINES ..... Mines Master Index File
ABANDONED MINES ..... Abandoned Mines
FINDS ..... Facility Index System/Facility Registry System
DOCKET HWC ..... Hazardous Waste Compliance Docket Listing
UXO ..... Unexploded Ordnance Sites
ECHO ..... Enforcement & Compliance History Information
FUELS PROGRAM ..... EPA Fuels Program Registered Listing
AIRS ..... Permitted Airs Facility List
NPDES ..... Comprehensive Environmental Data System
COAL ASH ..... Coal Ash Disposal Sites

EXECUTIVE SUMMARY

DRYCLEANERS..... Drycleaner List
ENF..... Enforcement Actions Data
Financial Assurance..... Financial Assurance Information Listing
TIER 2..... Tier 2 Information Listing
UIC..... Underground Injection Control Wells
MINES MRDS..... Mineral Resources Data System

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP..... EDR Proprietary Manufactured Gas Plants
EDR Hist Auto..... EDR Exclusive Historical Auto Stations
EDR Hist Cleaner..... EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF..... Recovered Government Archive Solid Waste Facilities List
RGA LUST..... Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Lists of state and tribal leaking storage tanks

LUST: The Leaking Underground Storage Tank Database.

A review of the LUST list, as provided by EDR, has revealed that there is 1 LUST site within approximately 0.875 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
UNISON STORE	21081 UNISON ROAD	NE 0 - 1/8 (0.013 mi.)	1	8

Database: LUST REG NO, Date of Government Version: 05/18/2004
Facility Status: Closed
Pollution Complaint #: 97-3066
Closed Date: 10/22/1999

EXECUTIVE SUMMARY

Facility ID: 3026037

LTANKS: The Leaking Tanks Database contains current Leaking petroleum tanks. The data comes from the Department of Environmental Quality.

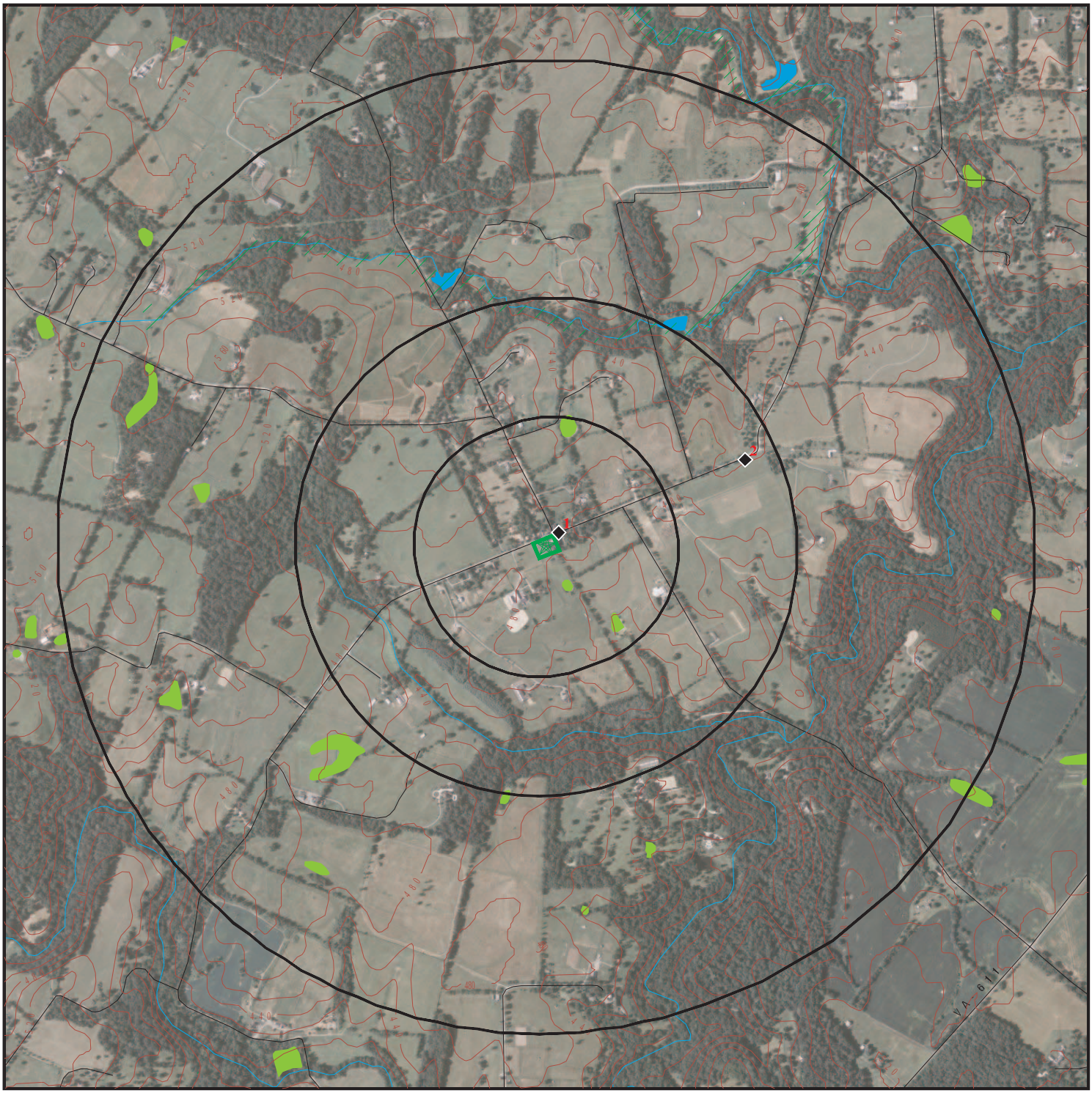
A review of the LTANKS list, as provided by EDR, and dated 08/02/2021 has revealed that there is 1 LTANKS site within approximately 0.875 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
P F HANSEN TESTAMENT Facility Status: Closed CEDS Facility Id: 200000881554 Pollution Complaint #: 20163093	20836 UNISON RD	ENE 1/4 - 1/2 (0.434 mi.)	2	8

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 6831014.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Unison Study Area	CLIENT: Emery & Garrett Groundwater
ADDRESS: 20985 Unison Road Middleburg VA 20117	CONTACT: Jon-Erik Tryggestad
	INQUIRY #: 6831014.2s
LAT/LONG: 39.03486 / 77.791195	DATE: January 24, 2022 4:31 pm

DETAIL MAP - 6831014.2S

Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/16 1/8 1/4 Miles

Indian Reservations BIA

National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Unison Study Area	CLIENT: Emery & Garrett Groundwater
ADDRESS: 20985 Unison Road Middleburg VA 20117	CONTACT: Jon-Erik Tryggestad INQUIRY #: 6831014.2s
LAT/LONG: 39.03486 / 77.791195	DATE: January 24, 2022 4:33 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Lists of Federal NPL (Superfund) sites								
NPL	0.875		0	0	0	0	NR	0
Proposed NPL	0.875		0	0	0	0	NR	0
NPL LIENS	0.875		0	0	0	0	NR	0
Lists of Federal Delisted NPL sites								
Delisted NPL	0.875		0	0	0	0	NR	0
Lists of Federal sites subject to CERCLA removals and CERCLA orders								
FEDERAL FACILITY	0.875		0	0	0	0	NR	0
SEMS	0.875		0	0	0	0	NR	0
Lists of Federal CERCLA sites with NFRAP								
SEMS-ARCHIVE	0.875		0	0	0	0	NR	0
Lists of Federal RCRA facilities undergoing Corrective Action								
CORRACTS	0.875		0	0	0	0	NR	0
Lists of Federal RCRA TSD facilities								
RCRA-TSDF	0.875		0	0	0	0	NR	0
Lists of Federal RCRA generators								
RCRA-LQG	0.875		0	0	0	0	NR	0
RCRA-SQG	0.875		0	0	0	0	NR	0
RCRA-VSQG	0.875		0	0	0	0	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.875		0	0	0	0	NR	0
US ENG CONTROLS	0.875		0	0	0	0	NR	0
US INST CONTROLS	0.875		0	0	0	0	NR	0
Federal ERNS list								
ERNS	0.875		0	0	0	0	NR	0
Lists of state- and tribal hazardous waste facilities								
SHWS	N/A		N/A	N/A	N/A	N/A	N/A	N/A
Lists of state and tribal landfills and solid waste disposal facilities								
SWF/LF	0.875		0	0	0	0	NR	0
Lists of state and tribal leaking storage tanks								
LUST	0.875		1	0	0	0	NR	1

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.875		0	0	0	0	NR	0
LTANKS	0.875		0	0	1	0	NR	1
Lists of state and tribal registered storage tanks								
FEMA UST	0.875		0	0	0	0	NR	0
UST	0.875		0	0	0	0	NR	0
AST	0.875		0	0	0	0	NR	0
INDIAN UST	0.875		0	0	0	0	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS	0.875		0	0	0	0	NR	0
INST CONTROL	0.875		0	0	0	0	NR	0
Lists of state and tribal voluntary cleanup sites								
INDIAN VCP	0.875		0	0	0	0	NR	0
VCP	0.875		0	0	0	0	NR	0
Lists of state and tribal brownfield sites								
BROWNFIELDS	0.875		0	0	0	0	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.875		0	0	0	0	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
INDIAN ODI	0.875		0	0	0	0	NR	0
ODI	0.875		0	0	0	0	NR	0
DEBRIS REGION 9	0.875		0	0	0	0	NR	0
IHS OPEN DUMPS	0.875		0	0	0	0	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.875		0	0	0	0	NR	0
US CDL	0.875		0	0	0	0	NR	0
Local Land Records								
LIENS 2	0.875		0	0	0	0	NR	0
Records of Emergency Release Reports								
HMIRS	0.875		0	0	0	0	NR	0
SPILLS	0.875		0	0	0	0	NR	0
SPILLS 90	0.875		0	0	0	0	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.875		0	0	0	0	NR	0
FUDS	0.875		0	0	0	0	NR	0
DOD	0.875		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SCRD DRYCLEANERS	0.875		0	0	0	0	NR	0
US FIN ASSUR	0.875		0	0	0	0	NR	0
EPA WATCH LIST	0.875		0	0	0	0	NR	0
2020 COR ACTION	0.875		0	0	0	0	NR	0
TSCA	0.875		0	0	0	0	NR	0
TRIS	0.875		0	0	0	0	NR	0
SSTS	0.875		0	0	0	0	NR	0
ROD	0.875		0	0	0	0	NR	0
RMP	0.875		0	0	0	0	NR	0
RAATS	0.875		0	0	0	0	NR	0
PRP	0.875		0	0	0	0	NR	0
PADS	0.875		0	0	0	0	NR	0
ICIS	0.875		0	0	0	0	NR	0
FTTS	0.875		0	0	0	0	NR	0
MLTS	0.875		0	0	0	0	NR	0
COAL ASH DOE	0.875		0	0	0	0	NR	0
COAL ASH EPA	0.875		0	0	0	0	NR	0
PCB TRANSFORMER	0.875		0	0	0	0	NR	0
RADINFO	0.875		0	0	0	0	NR	0
HIST FTTS	0.875		0	0	0	0	NR	0
DOT OPS	0.875		0	0	0	0	NR	0
CONSENT	0.875		0	0	0	0	NR	0
INDIAN RESERV	0.875		0	0	0	0	NR	0
FUSRAP	0.875		0	0	0	0	NR	0
UMTRA	0.875		0	0	0	0	NR	0
LEAD SMELTERS	0.875		0	0	0	0	NR	0
US AIRS	0.875		0	0	0	0	NR	0
US MINES	0.875		0	0	0	0	NR	0
ABANDONED MINES	0.875		0	0	0	0	NR	0
FINDS	0.875		0	0	0	0	NR	0
DOCKET HWC	0.875		0	0	0	0	NR	0
UXO	0.875		0	0	0	0	NR	0
ECHO	0.875		0	0	0	0	NR	0
FUELS PROGRAM	0.875		0	0	0	0	NR	0
AIRS	0.875		0	0	0	0	NR	0
NPDES	0.875		0	0	0	0	NR	0
COAL ASH	0.875		0	0	0	0	NR	0
DRYCLEANERS	0.875		0	0	0	0	NR	0
ENF	0.875		0	0	0	0	NR	0
Financial Assurance	0.875		0	0	0	0	NR	0
TIER 2	0.875		0	0	0	0	NR	0
UIC	0.875		0	0	0	0	NR	0
MINES MRDS	0.875		0	0	0	0	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	0.875		0	0	0	0	NR	0
EDR Hist Auto	0.875		0	0	0	0	NR	0
EDR Hist Cleaner	0.875		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.875		0	0	0	0	NR	0
RGA LUST	0.875		0	0	0	0	NR	0
- Totals --		0	1	0	1	0	0	2

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

1
NE
< 1/8
0.013 mi.
71 ft.

UNISON STORE
21081 UNISON ROAD
LOUDOUN, VA 22117

LUST **S103916150**
N/A

Relative:
Lower

Actual:
480 ft.

LUST REG NO:

Region:	NO
Facility ID:	3026037
Status:	**Closed**
Tank Size:	Not reported
Product:	kerosene
Release Date:	10/09/1996
Closed Date:	10/22/1999
Case Type:	Article 11
Case Officer:	Thomas R. Lancaster, P.G.
Pollution Complaint #:	97-3066
Permit Number:	Not reported
Priority:	3

2
ENE
1/4-1/2
0.434 mi.
2289 ft.

P F HANSEN TESTAMENTARY TRUST PROPERTY
20836 UNISON RD
ROUND HILL, VA 20141

LTANKS **S118456858**
N/A

Relative:
Lower

Actual:
458 ft.

LTANKS:

Name:	P F HANSEN TESTAMENTARY TRUST PROPERTY
Address:	20836 UNISON RD
City,State,Zip:	ROUND HILL, VA 20141
City,State,Zip:	ROUND HILL, VA 20141
Region:	NRO
CEDS Facility Id:	200000881554
Case Status:	**Closed**
Pollution Complaint #:	20163093
Reported:	11/05/2015
Case Closed Date:	01/28/2016
Program:	RP Lead
Federally Regulated UST (Y/N):	N
Regulated Petroleum UST (1):	N
Excluded UST (1):	N
Deferred UST (1):	N
Partially Deferred UST (1):	N
Exempt 1 UST (2):	N
Exempt 2 Heating Oil UST (2):	Y
Small Heating Oil AST (2):	N
Regulated AST (3):	N
Unregulated AST (3):	N
Other Y/N:	N
Unknown Y/N:	N
Other Description:	Not reported
Heating Oil Category:	Category 1

Count: 0 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/20/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 11/29/2021
Number of Days to Update: 24

Source: EPA
Telephone: N/A
Last EDR Contact: 01/13/2022
Next Scheduled EDR Contact: 04/11/2022
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/20/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 11/29/2021
Number of Days to Update: 24

Source: EPA
Telephone: N/A
Last EDR Contact: 01/13/2022
Next Scheduled EDR Contact: 04/11/2022
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Lists of Federal Delisted NPL sites

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/20/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 11/29/2021
Number of Days to Update: 24

Source: EPA
Telephone: N/A
Last EDR Contact: 01/13/2022
Next Scheduled EDR Contact: 04/11/2022
Data Release Frequency: Quarterly

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 05/25/2021
Date Data Arrived at EDR: 06/24/2021
Date Made Active in Reports: 09/20/2021
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 12/29/2021
Next Scheduled EDR Contact: 04/11/2022
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/20/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 11/29/2021
Number of Days to Update: 24

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 01/13/2022
Next Scheduled EDR Contact: 04/25/2022
Data Release Frequency: Quarterly

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 10/20/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 11/29/2021
Number of Days to Update: 24

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 01/13/2022
Next Scheduled EDR Contact: 04/25/2022
Data Release Frequency: Quarterly

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 09/13/2021
Date Data Arrived at EDR: 09/15/2021
Date Made Active in Reports: 10/12/2021
Number of Days to Update: 27

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/17/2021
Next Scheduled EDR Contact: 04/04/2022
Data Release Frequency: Quarterly

Lists of Federal RCRA TSD facilities

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/13/2021
Date Data Arrived at EDR: 09/15/2021
Date Made Active in Reports: 10/12/2021
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 12/17/2021
Next Scheduled EDR Contact: 04/04/2022
Data Release Frequency: Quarterly

Lists of Federal RCRA generators

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/13/2021
Date Data Arrived at EDR: 09/15/2021
Date Made Active in Reports: 10/12/2021
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 12/17/2021
Next Scheduled EDR Contact: 04/04/2022
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/13/2021
Date Data Arrived at EDR: 09/15/2021
Date Made Active in Reports: 10/12/2021
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 12/17/2021
Next Scheduled EDR Contact: 04/04/2022
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/13/2021
Date Data Arrived at EDR: 09/15/2021
Date Made Active in Reports: 10/12/2021
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 12/17/2021
Next Scheduled EDR Contact: 04/04/2022
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 07/12/2021
Date Data Arrived at EDR: 08/06/2021
Date Made Active in Reports: 10/22/2021
Number of Days to Update: 77

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/08/2021
Next Scheduled EDR Contact: 02/21/2022
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/23/2021
Date Data Arrived at EDR: 08/23/2021
Date Made Active in Reports: 11/12/2021
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/18/2021
Next Scheduled EDR Contact: 03/06/2022
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 08/23/2021
Date Data Arrived at EDR: 08/23/2021
Date Made Active in Reports: 11/12/2021
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/19/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/13/2021
Date Data Arrived at EDR: 09/21/2021
Date Made Active in Reports: 12/15/2021
Number of Days to Update: 85

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/16/2021
Next Scheduled EDR Contact: 04/04/2022
Data Release Frequency: Quarterly

Lists of state- and tribal hazardous waste facilities

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: Department of Environmental Quality
Telephone: 804-698-4236
Last EDR Contact: 12/09/2021
Next Scheduled EDR Contact: 03/28/2022
Data Release Frequency: N/A

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF: Solid Waste Management Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 03/02/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 05/21/2021
Number of Days to Update: 79

Source: Department of Environmental Quality
Telephone: 804-698-4238
Last EDR Contact: 11/29/2021
Next Scheduled EDR Contact: 03/14/2022
Data Release Frequency: Semi-Annually

Lists of state and tribal leaking storage tanks

LUST REG WC: Leaking Underground Storage Tank List

Leaking underground storage tank site locations. Includes: counties of Alleghany, Bedford, Botetourt, Craig, Floyd, Franklin, Giles, Henry, Montgomery, Patrick, Pulaski, Roanoke; cities of Bedford, Clifton Forge, Covington, Martinsville, Radford, Roanoke, Salem.

Date of Government Version: 06/04/2015
Date Data Arrived at EDR: 06/05/2015
Date Made Active in Reports: 07/07/2015
Number of Days to Update: 32

Source: Department of Environmental Quality West Central Regional Office
Telephone: 540-562-6700
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: No Update Planned

LUST REG VA: Leaking Underground Storage Tank List

Leaking underground storage tank site locations. Includes: counties of Albemarle, Augusta, Bath, Clarke, Fluvanna, Frederick, Greene, Highland, Nelson, Page, Rockbridge, Rockingham, Shenandoah, Warren; cities of Buena Vista, Charlottesville, Harrisonburg, Lexington, Staunton, Waynesboro, Winchester.

Date of Government Version: 12/06/2011
Date Data Arrived at EDR: 12/08/2011
Date Made Active in Reports: 01/16/2012
Number of Days to Update: 39

Source: Department of Environmental Quality Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: No Update Planned

LUST REG TD: Leaking Underground Storage Tank Sites
Leaking underground storage tank site locations. Includes: counties of Accomack, Isle of Wight, James City, Northampton, Southampton, York; cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 07/05/2013
Date Made Active in Reports: 09/16/2013
Number of Days to Update: 73

Source: Department of Environmental Quality Tidewater Regional Office
Telephone: trofoia@deq.vir
Last EDR Contact: 09/26/2016
Next Scheduled EDR Contact: 01/09/2017
Data Release Frequency: Quarterly

LUST REG SW: Leaking Underground Storage Tank Database
Leaking underground storage tank site locations. Includes: counties of Bland, Buchanan, Carroll, Dickenson, Grayson, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise, Wythe; cities of Bristol, Galax, Norton.

Date of Government Version: 07/15/2013
Date Data Arrived at EDR: 07/18/2013
Date Made Active in Reports: 09/16/2013
Number of Days to Update: 60

Source: Department of Environmental Quality Southwest Regional Office
Telephone: 276-676-4800
Last EDR Contact: 10/11/2016
Next Scheduled EDR Contact: 01/23/2017
Data Release Frequency: No Update Planned

LUST REG SC: Leaking Underground Storage Tanks
Leaking underground storage tank site locations. Includes: counties of Amherst, Appomattox, Buckingham, Campbell, Charlotte, Cumberland, Halifax, Lunenburg, Mecklenburg, Nottoway, Pittsylvania, Prince Deward; cities of Danville, Lynchburg.

Date of Government Version: 09/06/2013
Date Data Arrived at EDR: 09/06/2013
Date Made Active in Reports: 09/17/2013
Number of Days to Update: 11

Source: Department of Environmental Quality, South Central Region
Telephone: 434-582-5120
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Semi-Annually

LUST REG PD: Leaking Underground Storage Tank Sites
Leaking underground storage tank site locaitons. Includes: counties of Amelia, Brunswick, Charles City, Chesterfield, Dinwiddie, Essex, Gloucester, Goochland, Greensville, Hanover, Henrico, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northumberland, Powhatan, Prince George, Richmond, Surry, Sussex, Westmoreland; cities of Colonial Heights, Emporia, Hopewell, Petersburg.

Date of Government Version: 12/02/2014
Date Data Arrived at EDR: 12/04/2014
Date Made Active in Reports: 01/16/2015
Number of Days to Update: 43

Source: Department of Environmental Quality Piedmont Regional Office
Telephone: 804-527-5020
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Quarterly

LUST REG NO: Leaking Underground Storage Tank Tracking Database
Leaking underground storage tank site locations. Includes: counties of Arlington, Caroline, Culpeper, Fairfax, Fauquier, King George, Loudoun, Louisa, Madison, Orange, Prince William, Rappahannock, Spotsylvania, Stafford; cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas, Manassas Park.

Date of Government Version: 05/18/2004
Date Data Arrived at EDR: 05/22/2004
Date Made Active in Reports: 07/09/2004
Number of Days to Update: 48

Source: Department of Environmental Quality Northern Regional Office
Telephone: 703-583-3800
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 05/27/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/28/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 05/28/2021
Date Data Arrived at EDR: 06/22/2021
Date Made Active in Reports: 09/20/2021
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 05/17/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/06/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 06/01/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 05/27/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

LTANKS: Leaking Petroleum Storage Tanks
Includes releases of petroleum from underground storage tanks and aboveground storage tanks.

Date of Government Version: 08/02/2021
Date Data Arrived at EDR: 08/24/2021
Date Made Active in Reports: 11/16/2021
Number of Days to Update: 84

Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 11/22/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: Quarterly

Lists of state and tribal registered storage tanks

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/29/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 33

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/20/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Varies

UST: Registered Petroleum Storage Tanks
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 08/02/2021
Date Data Arrived at EDR: 08/24/2021
Date Made Active in Reports: 11/16/2021
Number of Days to Update: 84

Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 11/22/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: Quarterly

AST: Registered Petroleum Storage Tanks
Registered Aboveground Storage Tanks.

Date of Government Version: 08/02/2021
Date Data Arrived at EDR: 08/24/2021
Date Made Active in Reports: 11/16/2021
Number of Days to Update: 84

Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 11/22/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 06/01/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 05/27/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 05/27/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/28/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/06/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/17/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 05/28/2021
Date Data Arrived at EDR: 06/22/2021
Date Made Active in Reports: 09/20/2021
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 06/11/2021
Date Made Active in Reports: 09/07/2021
Number of Days to Update: 88

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

ENG CONTROLS: Engineering Controls Sites Listing
A listing of sites with Engineering Controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 10/05/2021
Date Data Arrived at EDR: 10/06/2021
Date Made Active in Reports: 01/03/2022
Number of Days to Update: 89

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/03/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Quarterly

INST CONTROL: Voluntary Remediation Program Database
Sites included in the Voluntary Remediation Program database that have deed restrictions.

Date of Government Version: 10/05/2021
Date Data Arrived at EDR: 10/06/2021
Date Made Active in Reports: 01/03/2022
Number of Days to Update: 89

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/03/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Quarterly

Lists of state and tribal voluntary cleanup sites

VRP: Voluntary Remediation Program
The Voluntary Cleanup Program encourages owners of elected contaminated sites to take the initiative and conduct voluntary cleanups that meet state environmental standards.

Date of Government Version: 10/05/2021
Date Data Arrived at EDR: 10/06/2021
Date Made Active in Reports: 01/03/2022
Number of Days to Update: 89

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 01/03/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Quarterly

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 07/08/2021
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/14/2021
Next Scheduled EDR Contact: 04/04/2022
Data Release Frequency: Varies

Lists of state and tribal brownfield sites

BROWNFIELDS: Brownfields Site Specific Assessments
To qualify for Brownfields Assessment, the site must meet the Federal definition of a Brownfields and should have contaminant issues that need to be addressed and a redevelopment plan supported by the local government and community. Virginia's Department of Environmental Quality performs brownfields assessments under a cooperative agreement with the U.S. Environmental Protection Agency at no cost to communities, property owners or, prospective purchasers. The assessment is an evaluation of environmental impacts caused by previous site uses similar to a Phase II Environmental Assessment.

Date of Government Version: 07/16/2021
Date Data Arrived at EDR: 07/20/2021
Date Made Active in Reports: 10/11/2021
Number of Days to Update: 83

Source: Department of Environmental Quality
Telephone: 804-698-4207
Last EDR Contact: 01/19/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/10/2021
Date Data Arrived at EDR: 06/10/2021
Date Made Active in Reports: 08/17/2021
Number of Days to Update: 68

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/08/2021
Next Scheduled EDR Contact: 03/28/2022
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 10/22/2021
Next Scheduled EDR Contact: 02/07/2022
Data Release Frequency: Varies

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/13/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 10/28/2021
Next Scheduled EDR Contact: 02/07/2022
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 05/18/2021
Date Data Arrived at EDR: 05/18/2021
Date Made Active in Reports: 08/03/2021
Number of Days to Update: 77

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/16/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 05/18/2021
Date Data Arrived at EDR: 05/18/2021
Date Made Active in Reports: 08/03/2021
Number of Days to Update: 77

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/16/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: Quarterly

PFAS: Per- and Polyfluoroalkyl Substances

PFOS and PFOA stand for perfluorooctane sulfonate and perfluorooctanoic acid, respectively. Both are fluorinated organic chemicals, part of a larger family of compounds referred to as perfluoroalkyl substances (PFASs).

Date of Government Version: 03/18/2021
Date Data Arrived at EDR: 04/06/2021
Date Made Active in Reports: 06/25/2021
Number of Days to Update: 80

Source: Department of Environmental Quality
Telephone: 804-698-4336
Last EDR Contact: 01/03/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Varies

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 10/20/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 11/29/2021
Number of Days to Update: 24

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 01/13/2022
Next Scheduled EDR Contact: 04/11/2022
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 09/12/2021
Date Data Arrived at EDR: 09/13/2021
Date Made Active in Reports: 09/28/2021
Number of Days to Update: 15

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 12/16/2021
Next Scheduled EDR Contact: 04/04/2022
Data Release Frequency: Quarterly

SPILLS: Prep/Spills Database Listing

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment. PREP staff often work to assist local emergency responders, other state agencies, federal agencies, and responsible parties, as may be needed, to manage pollution incidents. Oil spills, fish kills, and hazardous materials spills are examples of incidents that may involve the DEQ's PREP Program.

Date of Government Version: 08/02/2021
Date Data Arrived at EDR: 08/24/2021
Date Made Active in Reports: 11/17/2021
Number of Days to Update: 85

Source: Department of Environmental Quality
Telephone: 804-698-4287
Last EDR Contact: 11/22/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: Quarterly

SPILLS PC: Pollution Complaint Database

Pollution Complaints Database. The pollution reports contained in the PC database include the initial release reporting of Leaking Underground Storage Tanks and all other releases of petroleum to the environment as well as releases to state waters. The database is current through 12/1/93. Since that time, all spill and pollution reporting information has been collected and tracked through the DEQ regional offices.

Date of Government Version: 06/01/1996
Date Data Arrived at EDR: 10/22/1996
Date Made Active in Reports: 11/21/1996
Number of Days to Update: 30

Source: Department of Environmental Quality
Telephone: 804-698-4287
Last EDR Contact: 03/08/2010
Next Scheduled EDR Contact: 06/21/2010
Data Release Frequency: No Update Planned

SPILLS NO: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/29/2009
Date Made Active in Reports: 10/30/2009
Number of Days to Update: 31

Source: Department of Environmental Quality, Northern Region
Telephone: 703-583-3864
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

SPILLS PD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 10/20/2009
Date Data Arrived at EDR: 10/29/2009
Date Made Active in Reports: 12/03/2009
Number of Days to Update: 35

Source: Department of Environmental Quality, Piedmont Region
Telephone: 804-527-5020
Last EDR Contact: 02/06/2012
Next Scheduled EDR Contact: 05/21/2012
Data Release Frequency: Quarterly

SPILLS SW: Reportable Spills

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 01/21/2010
Date Data Arrived at EDR: 01/22/2010
Date Made Active in Reports: 02/16/2010
Number of Days to Update: 25

Source: Department of Environmental Quality, Southwest Region
Telephone: 276-676-4839
Last EDR Contact: 07/13/2012
Next Scheduled EDR Contact: 10/29/2012
Data Release Frequency: No Update Planned

SPILLS TD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/17/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/06/2009
Number of Days to Update: 13

Source: Department of Environmental Quality, Tidewater Region
Telephone: trofoia@deq.vir
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: Quarterly

SPILLS VA: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 08/08/2012
Date Data Arrived at EDR: 08/09/2012
Date Made Active in Reports: 10/05/2012
Number of Days to Update: 57

Source: Department of Environmental Quality, Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 05/06/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Quarterly

SPILLS WC: Prep Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/21/2009
Date Data Arrived at EDR: 09/29/2009
Date Made Active in Reports: 10/30/2009
Number of Days to Update: 31

Source: Department of Environmental Quality, West Central Region
Telephone: 540-562-6700
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

SPILLS BRL: Prep/Spills Database Listing

A listing of spills locations located in the Blue Ridge Regional area, Lynchburg.

Date of Government Version: 09/18/2009
Date Data Arrived at EDR: 09/18/2009
Date Made Active in Reports: 10/06/2009
Number of Days to Update: 18

Source: DEQ, Blue Ridge Regional Office
Telephone: 434-582-6218
Last EDR Contact: 11/28/2011
Next Scheduled EDR Contact: 03/12/2012
Data Release Frequency: Varies

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 09/01/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 43

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/13/2021
Date Data Arrived at EDR: 09/15/2021
Date Made Active in Reports: 10/12/2021
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 12/17/2021
Next Scheduled EDR Contact: 04/04/2022
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 08/10/2021
Date Data Arrived at EDR: 08/17/2021
Date Made Active in Reports: 10/22/2021
Number of Days to Update: 66

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 11/16/2021
Next Scheduled EDR Contact: 02/28/2022
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/14/2022
Next Scheduled EDR Contact: 04/25/2022
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/07/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 11/08/2021
Next Scheduled EDR Contact: 02/21/2022
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/13/2021
Date Data Arrived at EDR: 09/15/2021
Date Made Active in Reports: 09/28/2021
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 12/17/2021
Next Scheduled EDR Contact: 04/04/2022
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 11/01/2021
Next Scheduled EDR Contact: 02/14/2022
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 11/05/2021
Next Scheduled EDR Contact: 02/14/2022
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/17/2020
Date Made Active in Reports: 09/10/2020
Number of Days to Update: 85

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/17/2021
Next Scheduled EDR Contact: 03/28/2022
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 08/14/2020
Date Made Active in Reports: 11/04/2020
Number of Days to Update: 82

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 11/16/2021
Next Scheduled EDR Contact: 02/28/2022
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 10/18/2021
Date Data Arrived at EDR: 10/20/2021
Date Made Active in Reports: 01/10/2022
Number of Days to Update: 82

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/19/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 10/20/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 11/29/2021
Number of Days to Update: 24

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/01/2021
Next Scheduled EDR Contact: 03/14/2022
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 10/20/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 11/12/2021
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/20/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 12/15/2021
Number of Days to Update: 40

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 01/13/2022
Next Scheduled EDR Contact: 02/14/2022
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/19/2020
Date Data Arrived at EDR: 01/08/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 73

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/07/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/29/2021
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/29/2021
Date Data Arrived at EDR: 08/24/2021
Date Made Active in Reports: 11/19/2021
Number of Days to Update: 87

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 05/02/2022
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 12/01/2020
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 70

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 11/30/2021
Next Scheduled EDR Contact: 03/14/2022
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/02/2021
Next Scheduled EDR Contact: 03/14/2022
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/05/2021
Next Scheduled EDR Contact: 02/14/2022
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 12/27/2021
Next Scheduled EDR Contact: 04/11/2022
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 10/26/2021
Next Scheduled EDR Contact: 02/07/2022
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/30/2021
Date Data Arrived at EDR: 10/13/2021
Date Made Active in Reports: 01/10/2022
Number of Days to Update: 89

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 01/03/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 09/15/2021
Date Made Active in Reports: 12/14/2021
Number of Days to Update: 90

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 12/17/2021
Next Scheduled EDR Contact: 04/04/2022
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/04/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 07/26/2021
Date Data Arrived at EDR: 07/27/2021
Date Made Active in Reports: 10/22/2021
Number of Days to Update: 87

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 11/01/2021
Next Scheduled EDR Contact: 02/14/2022
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 12/09/2021
Next Scheduled EDR Contact: 02/28/2022
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 10/20/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 11/29/2021
Number of Days to Update: 24

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 01/13/2022
Next Scheduled EDR Contact: 04/11/2022
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/09/2021
Date Data Arrived at EDR: 08/24/2021
Date Made Active in Reports: 11/19/2021
Number of Days to Update: 87

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 11/22/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 06/30/2021
Date Data Arrived at EDR: 07/01/2021
Date Made Active in Reports: 09/28/2021
Number of Days to Update: 89

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 12/20/2021
Next Scheduled EDR Contact: 03/14/2022
Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/06/2020
Date Data Arrived at EDR: 05/27/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 78

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/22/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/22/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 09/14/2021
Date Data Arrived at EDR: 09/15/2021
Date Made Active in Reports: 12/15/2021
Number of Days to Update: 91

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 12/14/2021
Next Scheduled EDR Contact: 03/21/2022
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 05/05/2021
Date Data Arrived at EDR: 05/18/2021
Date Made Active in Reports: 08/17/2021
Number of Days to Update: 91

Source: EPA
Telephone: (215) 814-5000
Last EDR Contact: 11/22/2021
Next Scheduled EDR Contact: 03/14/2022
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/06/2021
Date Data Arrived at EDR: 05/21/2021
Date Made Active in Reports: 08/11/2021
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 11/23/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 01/01/2022
Date Data Arrived at EDR: 01/04/2022
Date Made Active in Reports: 01/10/2022
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 01/04/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 07/02/2020
Date Made Active in Reports: 09/17/2020
Number of Days to Update: 77

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 01/11/2022
Next Scheduled EDR Contact: 04/25/2022
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 08/13/2021
Date Data Arrived at EDR: 08/13/2021
Date Made Active in Reports: 10/22/2021
Number of Days to Update: 70

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 11/15/2021
Next Scheduled EDR Contact: 02/28/2022
Data Release Frequency: Quarterly

AIRS: Permitted Airs Facility List

A listing of permitted Airs facilities.

Date of Government Version: 09/20/2021
Date Data Arrived at EDR: 09/23/2021
Date Made Active in Reports: 12/15/2021
Number of Days to Update: 83

Source: Department of Environmental Quality
Telephone: 804-698-4000
Last EDR Contact: 12/09/2021
Next Scheduled EDR Contact: 03/28/2022
Data Release Frequency: Annually

CEDS: Comprehensive Environmental Data System

Virginia Water Protection Permits, Virginia Pollution Discharge System (point discharge) permits and Virginia Pollution Abatement (no point discharge) permits.

Date of Government Version: 09/14/2021
Date Data Arrived at EDR: 09/15/2021
Date Made Active in Reports: 09/23/2021
Number of Days to Update: 8

Source: Department of Environmental Quality
Telephone: 804-698-4077
Last EDR Contact: 11/29/2021
Next Scheduled EDR Contact: 03/14/2022
Data Release Frequency: Quarterly

COAL ASH: Coal Ash Disposal Sites

A listing of facilities with coal ash impoundments.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 05/26/2021
Date Made Active in Reports: 08/18/2021
Number of Days to Update: 84

Source: Department of Environmental Protection
Telephone: 804-698-4285
Last EDR Contact: 11/29/2021
Next Scheduled EDR Contact: 03/14/2022
Data Release Frequency: Varies

DRYCLEANERS: Drycleaner List

A listing of registered drycleaners.

Date of Government Version: 10/15/2021
Date Data Arrived at EDR: 10/19/2021
Date Made Active in Reports: 01/12/2022
Number of Days to Update: 85

Source: Department of Environmental Quality
Telephone: 804-698-4407
Last EDR Contact: 01/18/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Varies

ENFORCEMENT: Enforcement Actions Data

A listing of enforcement actions.

Date of Government Version: 07/22/2021
Date Data Arrived at EDR: 07/27/2021
Date Made Active in Reports: 10/22/2021
Number of Days to Update: 87

Source: Department of Environmental Quality
Telephone: 804-698-4031
Last EDR Contact: 12/20/2021
Next Scheduled EDR Contact: 04/11/2022
Data Release Frequency: Quarterly

Financial Assurance 1: Financial Assurance Information Listing

A listing of financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 10/25/2021
Date Data Arrived at EDR: 10/28/2021
Date Made Active in Reports: 01/19/2022
Number of Days to Update: 83

Source: Department of Environmental Quality
Telephone: 804-698-4205
Last EDR Contact: 10/25/2021
Next Scheduled EDR Contact: 02/07/2022
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information listing

Solid waste financial assurance information.

Date of Government Version: 07/24/2021
Date Data Arrived at EDR: 07/27/2021
Date Made Active in Reports: 10/20/2021
Number of Days to Update: 85

Source: Department of Environmental Quality
Telephone: 804-698-4123
Last EDR Contact: 10/25/2021
Next Scheduled EDR Contact: 02/07/2022
Data Release Frequency: Varies

TIER 2: Tier 2 Information Listing

A listing of facilities which store or manufacture hazardous materials and submit a chemical inventory report.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 06/23/2021
Date Made Active in Reports: 07/07/2021
Number of Days to Update: 14

Source: Department of Environmental Quality
Telephone: 804-698-4159
Last EDR Contact: 12/20/2021
Next Scheduled EDR Contact: 03/28/2022
Data Release Frequency: No Update Planned

UIC: Underground Injection Control Wells

A listing of underground injection controls wells.

Date of Government Version: 10/26/2021
Date Data Arrived at EDR: 10/27/2021
Date Made Active in Reports: 01/19/2022
Number of Days to Update: 84

Source: Department of Mines, Minerals and Energy
Telephone: 276-415-9700
Last EDR Contact: 10/27/2021
Next Scheduled EDR Contact: 02/07/2022
Data Release Frequency: Quarterly

MINES MRDS: Mineral Resources Data System

Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 11/23/2021
Next Scheduled EDR Contact: 03/07/2022
Data Release Frequency: Varies

PCS: Permit Compliance System

PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 12/29/2021
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Semi-Annually

PCS INACTIVE: Listing of Inactive PCS Permits

An inactive permit is a facility that has shut down or is no longer discharging.

Date of Government Version: 11/05/2014
Date Data Arrived at EDR: 01/06/2015
Date Made Active in Reports: 05/06/2015
Number of Days to Update: 120

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 12/29/2021
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Semi-Annually

PCS ENF: Enforcement data
No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 12/29/2021
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners
EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List
The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Virgina.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 203

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank
The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Virgina and at the Regional VA Levels.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/15/2014
Number of Days to Update: 198

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/23/2021
Date Data Arrived at EDR: 08/10/2021
Date Made Active in Reports: 11/08/2021
Number of Days to Update: 90

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/12/2021
Next Scheduled EDR Contact: 02/21/2022
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/07/2022
Next Scheduled EDR Contact: 04/18/2022
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 10/29/2021
Date Made Active in Reports: 01/19/2022
Number of Days to Update: 82

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 10/29/2021
Next Scheduled EDR Contact: 02/07/2022
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/10/2022
Next Scheduled EDR Contact: 04/25/2022
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 02/24/2021
Number of Days to Update: 13

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/29/2021
Next Scheduled EDR Contact: 02/28/2022
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/06/2021
Next Scheduled EDR Contact: 03/21/2022
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 804-692-1900

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

Emery & Garrett Groundwater Investigations
A Division of GZA GeoEnvironmental, Inc.

Appendix F

Flow Analysis Technical Memorandum

Dewberry

Date: February 17, 2022

To: Andrew Beatty, P.E.

From: Randall Flowers, P.E.

Subject: Unison Flow Analysis Technical Memorandum

Introduction

Project Background

The Village of Unison (Unison) is located in a historic district in Loudoun County, Virginia. Unison is a Virginia Historic Landmark (ID#053-0692) and is listed on the National Register of Historic Places (ID#3000442). The community water is provided via individual private wells, and wastewater is managed by the use of individual septic systems, pump and haul, pit privy or alternative dispersal/pre-treatment. In 2020, Unison submitted an application for the Water and Wastewater Program (The Program) for assistance with both their water and wastewater needs. A map of Unison, which shows the study boundary, is included as **Figure 1**. There are 34 total parcels within the study boundary, including two (2) vacant parcels.

Dewberry Engineers Inc. (Dewberry) is under agreement with Loudoun Water to develop an engineering feasibility study for Unison in order to ascertain potential technical solutions to the community's water and wastewater needs. The following options are being evaluated to help improve water and wastewater conditions within the Village of Unison:

Water:

1. Upgrade Existing On-Site Systems
2. Communal Water Treatment Facility (Using New Community Well)
3. Wholesale Purchase of Water from a Nearby Municipal System

Wastewater:

1. Upgrade Existing On-Site Systems
2. Subsurface Discharging Wastewater Treatment Facility
3. Surface Water Discharging Wastewater Treatment Facility (with Potential Discharge into Beaverdam Creek)
4. Conveyance and Pump Station Connection to a Nearby St. Louis Community System

Technical Memorandum Purpose

The purpose of this technical memorandum (TM) is to present the current and future water demand/sewage flow estimates for the Unison community and to provide a recommendation for the water demand/sewage flow to be used when evaluating sizing water/sewer distribution piping and associated treatment facilities, should they be necessary. The TM is divided into the following sections:

- Introduction
  - Project Background
  - Purpose of TM
- Water Demand Analysis
  - Water Regulatory Requirements
  - Existing Water Demand Estimates
  - Potential Future Water Demand Estimates
- Sewage Flow Analysis
  - Sewer Regulatory Requirements
  - Existing Sewage Flow Estimates
  - Potential Future Sewage Flow Estimates
- Conclusion

Figure 1 – Unison Study Boundary

Water Demand Analysis

This section describes how the existing and potential future water demands were determined for the Unison community and presents these estimates. Due to the historic nature of this community, current and future water demand estimates for the community have been developed by considering regulatory requirements, current zoning, the Loudoun County Comprehensive Plan and engineering best practices. These methods will be described in detail below.

Water Regulatory Requirements

Loudoun Water's Engineering Design Manual (EDM) standards, Loudoun County's Facility Standards Manual (FSM), the Loudoun County Codified Ordinances, and Commonwealth of Virginia statue 12VAC5-590-640 — General Design Considerations, which are administered by the Virginia Department of Health (VDH), were considered for water demand regulations.

Based on research of the parcels within the study boundary shown in **Figure 1**, the existing buildings and structures within the Unison community that would be connected to water include one (1) church and 31 dwelling units. It should be noted that three (3) of the 31 properties with dwelling units also have additional structures and/or uses. However per the site visit conducted on December 14th, 2021 and records research, it appears that these properties, which consist of the Unison Pottery and Tile Store, the Eight Oaks Farm and the Unison Store, are primarily utilized as a permanent residence.

The two (2) vacant parcels, as well as structures that do not require water service (e.g., sheds), were not considered in the existing demand estimates. **Table 1** summarizes the community by use.

Table 1 – Unison Community by Use

Use	# of Existing Buildings
Dwelling Units	31
Church	1

Using these existing buildings and structures within the Unison community, the applicable standards to be used for the demand estimates were then determined.

Demands for dwelling units were estimated using Loudoun Water's EDM standards since all other applicable standards require a community population, and the exact population of the Unison community within the study boundary cannot be determined using available population data sources (including, but not limited to, US Census, Commonwealth of Virginia, and Loudoun County population data). Loudoun Water's EDM standards are based on the number of dwelling units within the community, which has been determined using available data. The EDM standards state to include 3.5 persons per dwelling unit, and 100 gallons per day (gpd) for each person within the dwelling unit, therefore; the exact demand for each dwelling unit was determined to be 350 gpd.

Demands for churches are not explicitly provided in any of the listed standards. However, as outlined in the VDH regulations, demands can be based on sound engineering practice. Therefore, demand for the Unison United Methodist Church was estimated using the historic (12VAC-590-690) demand calculations of 'theaters, auditorium type' (5 gpd/seat), as the usage of these facilities is similar. A conservative average daily demand (ADD) was calculated using the maximum capacity of the church, which was estimated to be approximately 150 seats based on online research.

The standards used in calculating the estimated demands are summarized in **Table 2**.

Table 2 – Water Demand Estimate Standards

Regulating Agency	Facility	Unit	Demand (gpd)
Loudoun Water EDM	Dwelling Unit	Per Dwelling Unit	350
VDH	Church	Per Seat	5

After calculating the total ADD, the peak hour demand can be calculated using Loudoun Water standards. According to the EDM, the maximum daily demand is found by multiplying the average daily water demand by 2, and the peak hour demand is found by multiplying the maximum ADD by 2.

Existing Water Demand Estimates

As described above, Loudoun Water's EDM standards were used to estimate water demand for dwelling units, and VDH standards/sound engineering practice were used to estimate water demand for the Unison United Methodist Church. The existing water demand estimates are summarized in **Table 3**.

Table 3 – Existing Water Demand Estimates

Current Development				
Use	**Quantity**	**Demand**	**Unit**	**Estimated Existing ADD (gpd)**
Dwelling Unit	31	350	gpd/dwelling unit	10,850
Church (Seats)	150	5	gpd/seat	750
			Total	**11,600**

The existing estimated ADD for water was calculated to be 11,600 gpd. Therefore, the maximum daily demand is 23,200 gpd, and the peak hour demand is 46,400 gpd. The peak hour demand in gallons per minute (gpm) is 32 gpm.

However, there are several additional requirements that need to be met when determining the required quantity of water to serve the community. These requirements are as follows:

- Loudoun Water – 1.8 gpm per connection (for community water systems with 26 to 50 connections)
- Loudoun County – 1.0 gpm per connection

As previously described, there are 31 dwelling units and one (1) church in Unison. Assuming all of these facilities would be connected to water, should a water system be installed at Unison, there would be 32 connections. Loudoun Water has the most conservative connection requirements, therefore; the total minimum required demand would be as calculated below:

$$32\ connections\ \times\ 1.8\ gpm/connection\ \sim\ 58\ gpm$$

Since the estimated water demand using the Loudoun Water requirement of 1.8 gpm per connection is more conservative than the estimated peak hour demand by use, the existing water demand for the Unison community is estimated to be 58 gpm.

Potential Future Water Demand Estimates

All parcels within the Unison study boundary are zoned Agricultural Rural-2 (AR-2). Per the Revised 1993 Loudoun County Zoning Ordinance (LCZO), all development options for AR-2 require that the parcel area

be at least 40-acres. Since the largest parcel area within the Unison study boundary is 25-acres, there are no parcels within the boundary that could be further sub-divided.

However, since one (1) dwelling unit is permitted per 40 acres of a parcel, the potential future water demand estimates were developed by assuming that the two (2) vacant parcels within the study boundary would each be developed with one (1) dwelling unit. Demand for the rest of the parcels, which include 31 dwelling units and one (1) church, are assumed to remain the same since development cannot occur, assuming that zoning does not change. Therefore, a total of 33 dwelling units and one (1) church could potentially be occupied and require water service in the future. The potential future water demand estimates are summarized in **Table 4**.

Table 4 – Potential Future Water Demand Estimates

Potential Future Demand				
Use	**Quantity**	**Demand**	**Unit**	**Estimated Future ADD (gpd)**
Dwelling Unit	33	350	gpd/dwelling unit	11,550
Church (Seats)	150	5	gpd/seat	750
			Total	**12,300**

The potential future ADD for water was calculated to be 12,300 gpd. Therefore, the maximum daily demand is 24,600 gpd, and the peak hour demand is 49,200 gpd. The peak hour demand in gallons per minute is 34 gpm.

As previously described, Loudoun Water requires that a demand of 1.8 gpm be provided per connection (for community water systems with 26 to 50 connections). Since two (2) connections would be added to the existing 32 connections, the total minimum required potential future demand would be as calculated below:

$$34\ connections\ \times\ 1.8\ gpm/connection\ \sim\ 61\ gpm$$

As previously concluded, since the estimated water demand using the Loudoun Water requirement of 1.8 gpm per connection is more conservative than the estimated peak hour demand by use, the potential future water demand for the Unison community is estimated to be 61 gpm.

Sewage Flow Analysis

This section describes how the existing and potential future sewage flows were determined for the Unison community and presents these estimates. As with the water demand analysis, due to the historic nature of this community, current and future sewage flows for the community have been developed by considering regulatory requirements, current zoning, the Loudoun County Comprehensive Plan and engineering best practices. These methods will be described in detail below.

Sewer Regulatory Requirements

Loudoun Water's EDM standards, Loudoun County's FSM, Loudoun County Codified Ordinances, and Commonwealth of Virginia statues 9VAC25-790-310 – Design factors and 9VAC25-790-460 — Standards, which are administered by the VDH, were considered for flow regulations.

As previously described, the existing buildings and structures within the Unison community that would be connected to sewer include 31 dwelling units and one (1) church. Using these existing buildings and

structures within the Unison community, the applicable standards to be used for the flow estimates were then determined.

Sewage flow for dwelling units were estimated using EDM standards since all other standards require a community population, which cannot be determined for Unison, as previously described. All dwelling units in Unison are considered single family detached units.

Flows for churches are not provided in any of the listed standards. It was assumed that sewage flow for the Unison United Methodist Church can be estimated using the VDH criteria for 'theaters, auditorium type' (5 gpd/seat), as the usage of these facilities is similar. In addition, it was confirmed that several other state jurisdictions utilize similar criteria (5 gpd/seat). Sewage flow was conservatively calculated using the maximum capacity of the church, which was estimated to be approximately 150 seats based on online research. Since this estimate is more conservative than the EDM, the VDH standard was used to estimate the sewage flow from the church.

The standards used in calculating the estimated demands are summarized in **Table 5**.

Table 5 – Sewage Flow Estimate Standards

Regulating Agency	Facility	Unit	Flow (gpd)
Loudoun Water EDM	Single Family Detached Unit	Per Single Family Detached Unit	350
VDH	Church	Per Seat	5

After calculating the average daily sewage flow per the above table, the peak daily flow can be calculated using Loudoun Water's EDM/VDH standards. According to both the EDM and VDH, the peak daily flow of a trunk sewer is found by multiplying the average daily sewage flow by a peaking factor of 2.5.

Existing Sewage Flow Estimates

As described above, the EDM standard for a single family detached unit was used to estimate sewage flow for dwelling units, and the VDH standard for theaters (auditorium type) was used to estimate sewage flow from the Unison United Methodist Church. The existing sewage flow estimates are summarized in **Table 6**.

Table 6 – Existing Sewage Flow Estimates

Current Development				
Use	**Quantity**	**Demand**	**Unit**	**Estimated Flow (gpd)**
Single Family Detached Unit	31	350	gpd/single family detached unit	10,850
Church (Seats)	150	5	gpd/seat	750
			Total	**11,600**

The estimated existing average sewage flow was calculated to be approximately 11,600 gpd. Multiplying this by a peaking factor of 2.5, the peak daily flow was calculated to be approximately 29,000 gpd. Dividing the peak daily flow by 1,440 gpd/gpm, the peak instantaneous flow was calculated to be approximately 20 gpm.

Potential Future Sewage Flow Estimates

As previously described, due to all parcels within the Unison community being zoned AR-2 and being sized less than 40 acres, there are no parcels within the boundary that could be further sub-divided.

Similar to the potential future water demand estimates, the potential future sewage flow estimates were developed by assuming that the two (2) vacant parcels within the study boundary would be developed with a single family detached unit. Therefore, a total of 33 single family detached units and one (1) church could potentially be occupied and require sewer service in the future. The potential future sewage flow estimates are summarized in **Table 7**.

Table 7 – Potential Future Sewage Flow Estimates

Potential Future Flows				
Use	**Quantity**	**Demand**	**Unit**	**Estimated Flow (gpd)**
Single Family Detached Unit	33	350	gpd/single family detached unit	11,550
Church (Seats)	150	5	gpd/seat	750
			Total	**12,300**

The estimated average future sewage flow was calculated to be approximately 12,300 gpd. Multiplying this by a peaking factor of 2.5, the peak daily flow was calculated to be approximately 30,750 gpd. Dividing the peak daily flow by 1,440 gpd/gpm, the peak instantaneous flow was calculated to be approximately 21 gpm.

Conclusion

For existing development demand estimates, water demand/sewage flows for dwelling units/single family detached units were estimated using Loudoun Water's EDM standards, and water demand/sewage flows for the Unison United Methodist Church were estimated using VDH standards. The potential future water demand/sewage flow estimates were developed by assuming that the two (2) vacant parcels within the Unison study boundary become occupied and require water and sewer service. The results of the analysis are summarized in **Table 8**.

Table 8 – Flow Analysis Results

	Water Demand	Sewage Flow
Existing Development	58 gpm	20 gpm
Potential Future Build-Out	61 gpm	21 gpm

Based on the previously described analysis and results shown in the above table, the recommended water demand to be used for sizing water distribution piping and an associated communal well/water treatment facility (as needed) for the Unison community is 61 gpm. The recommended sewage flow to be used for sizing sewer distribution piping and an associated wastewater treatment facility (as needed) for the Unison community is 21 gpm. It should be noted that the small size of the Unison community results in very minor differences between existing development and potential future build-out. Since the difference between the current and future demand and flow is so small, it is recommended that any solution be built for the future condition, without phasing, since there is a negligible difference operationally or in the cost of building the larger infrastructure.

Appendix G

Soil Analysis Technical Memorandum

Dewberry

MEMORANDUM

Date: February 24, 2022

To: Andrew Beatty, P.E.

From: Randall Flowers, P.E.

Subject: **DRAFT -** Unison Soil Analysis Technical Memorandum

Introduction

Project Background

The Village of Unison (Unison) is located in a historic district in Loudoun County, Virginia. Unison is a Virginia Historic Landmark (ID#053-0692) and is listed on the National Register of Historic Places (ID#3000442). The community water is provided via individual private wells, and wastewater is managed by the use of individual septic systems, pump and haul, pit privy or alternative dispersal/pre-treatment. In 2020, Unison submitted an application for the Community Water and Wastewater Program (The Program) for assistance for both their water and wastewater needs. A map of Unison, which shows the study boundary, is included as **Figure 1**. There are 34 total parcels within the study boundary, including two (2) vacant parcels.

Dewberry Engineers Inc. (Dewberry) is under agreement with Loudoun Water to develop an engineering feasibility study for Unison in order to investigate potential technical solutions to the community's water and wastewater needs. The following options are being evaluated to help improve water and wastewater conditions within the Village of Unison:

Water:

1. Upgrade Existing On-Site Systems
2. Communal Water Treatment Facility (Using New Community Well)
3. Wholesale Purchase of Water from a Nearby Municipal System

Wastewater:

1. Upgrade Existing On-Site Systems
2. Subsurface Discharging Wastewater Treatment Facility
3. Surface Water Discharging Wastewater Treatment Facility (with Potential Discharge into Beaverdam Creek)
4. Conveyance and Pump Station Connection to the St. Louis Community System

Technical Memorandum Purpose

The purpose of this technical memorandum (TM) is to present the findings of the soil analysis completed by Dewberry and Marsh & Legge Land Surveyor, P.L.C. (Marsh & Legge), and to identify potential drainfield sites, should a communal subsurface discharging wastewater treatment facility be pursued. The TM is divided into the following sections:

- Introduction
  - Project Background
  - Purpose of TM
- Preliminary Review & Potential Parcels
- Sewage Flow Analysis
- Soil Analysis
  - Drainfield Area
  - Disposal Limits
  - Dilution Area
  - Estimated Total Land Requirement
- Conclusion

Figure 1 – Unison Study Boundary

Preliminary Review & Potential Parcels

Dewberry completed a preliminary review of soils and existing features for parcels near and within the Unison study boundary in order to identify potential drainfield sites using Loudoun County Geographic Information System (GIS) data.

GIS data was used to identify soil types and potential of the soil from very poor (severe problems) to good (few major problems), as well as locations of soil drains, within each parcel. Soil potential is dependent on soil characteristics and site topography. A breakdown of the soil types and areas for each parcel, as well as descriptions for each soil type identified, is included in **Attachment A**. When considering drainfield placement, areas containing soils with very poor potential, soil drains and higher slopes (due to topography) should be avoided.

Dewberry contracted Marsh & Legge to further investigate up to seven (7) parcels. When selecting parcels for further analysis, parcel size was considered. Of the 34 parcels within the Unison study boundary, four (4) parcels are greater than 20 acres in size, and the remaining parcels are less than 10 acres in size. Five (5) parcels adjacent to or near the study boundary that range from approximately 45 acres to 268 acres in size were also evaluated. Larger parcel sizes are preferred to ensure sufficient area for the wastewater treatment system, which includes a wastewater treatment plant (WWTP), drainfield with nitrogen dilution area, and 100% reserve drainfield. Based on the preliminary soil analysis and parcel size evaluation, it was assumed that the seven (7) largest parcels, including two (2) parcels within the Unison study boundary and the five (5) parcels evaluated outside of the boundary, may have adequate soil and area wastewater treatment system. In addition to soil types and parcel area, required setback distances were also considered.

Drainfields must meet required setback distances from existing property features, such as abandoned wells and drainfields, structures, streams and water bodies, forests and floodplains. The Commonwealth of Virginia Statue 12VAC5-610-597, which is administered by the Virginia Department of Health (VDH), and Loudoun County Code of Ordinances, Chapter 1066, identify setback requirements for these and other features. The minimum horizontal distance required between a drainfield and relevant features are listed in **Table 1**.

Table 1 – Minimum Setback Requirements

Feature	Minimum Horizontal Distance (ft)
Property Lines	5
Building Foundations	10
Drinking Water Wells (All Classes)	50
Natural Lakes and Impounded Waters	50
Streams	50
Utility Lines	10

Based on the above considerations, Dewberry selected the following seven (7) parcels, which are also shown in **Figure 2,** to be further analyzed by Marsh & Legge.

Table 2 – Parcels Selected for Further Analysis

Parcel Number*	Parcel ID	Parcel Size (Acres)	Distance from Unison (Miles)**
1	618101628000	25	0.28
2	618306814000	21.849	0.37
3	618174821000	45.607	0.49
4	640496940000	268.369	1.43
5	593163665000	97.3	0.68
6	619486952000	52.099	0.64
7	619360718000	158.49	1.42

*Parcel numbers were generated by Dewberry and serve no purpose other than identification
**From intersection of Bloomfield Rd and Unison Rd (near center of Unison study boundary) to outermost edge of parcel boundary

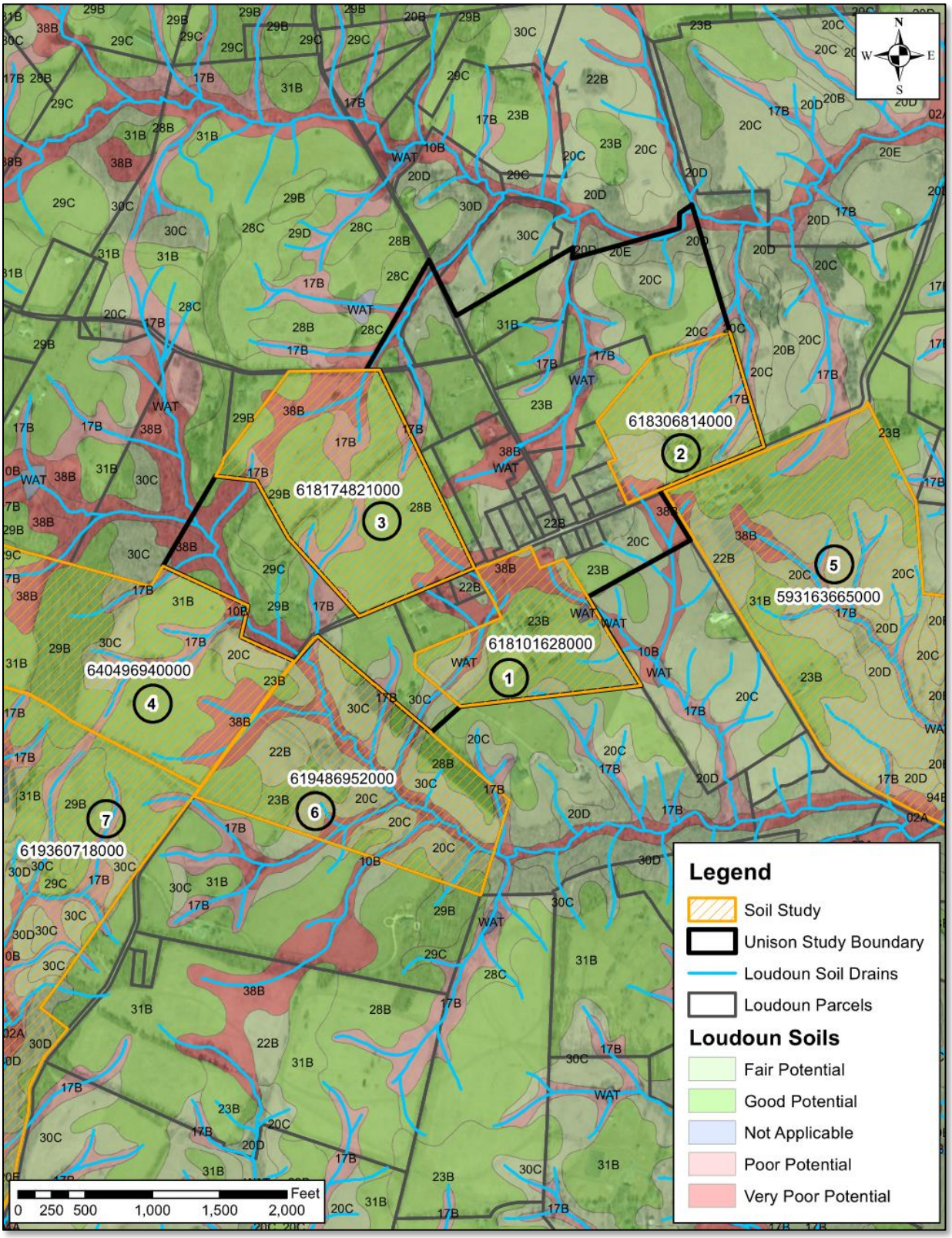


Figure 2 – Parcels Chosen for Further Soil Study

Sewage Flow Analysis

A sewage flow estimate is necessary to properly size the sewer treatment and disposal system for the community. Dewberry submitted a technical memorandum to Loudoun Water and Loudoun County (dated February 17, 2022) that details the sewage flow analysis for the Village of Unison. A summary of the sewage flow analysis is provided in this section.

The sewage flow analysis estimated both existing sewage flows for the current development and potential future flows. As previously stated, there are 34 total parcels within the study boundary, including two (2) vacant parcels. The current development includes 31 dwelling units, and one (1) church. For the potential future sewage flow estimates, it was assumed that the two (2) vacant parcels within the study boundary would be developed with a dwelling unit. Assuming the current zoning of the community (Agricultural-Residential 2) does not change, future build-out is not expected in any other parcels. Therefore, a total of 33 dwelling units and one (1) church could potentially be occupied and require sewer service in the future.

Both existing and future average sewage flow estimates were calculated using Loudoun Water's Engineering Design Manual (EDM) standards for dwelling units (350 gallons per day (gpd) per dwelling unit), and VDH standards for the Unison United Methodist Church (5 gpd/seat, for 150 seats). Peak flow estimates were calculated by applying a peaking factor of 2.5 to the average flow, per Loudoun Water EDM requirements. The results of the sewage flow analysis are summarized in **Table 3**.

Table 3 – Sewage Flow Analysis Summary

Flow Scenario	Estimated Average Flow (gpd)	Estimated Peak Flow (gpd)
Current Development	11,600	29,000
Potential Future Flows	12,300	30,750

It should be noted that the small size of the Unison community results in very minor differences between the existing development and potential future build-out. Since the difference between the current and potential future sewage flow is so small, it is recommended that any solution be built for the future condition, without phasing, since there is a negligible difference operationally or in the cost of building the larger infrastructure. Therefore, when calculating the required drainfield and nitrogen dilution areas, a sewage flow of 30,750 gpd was used.

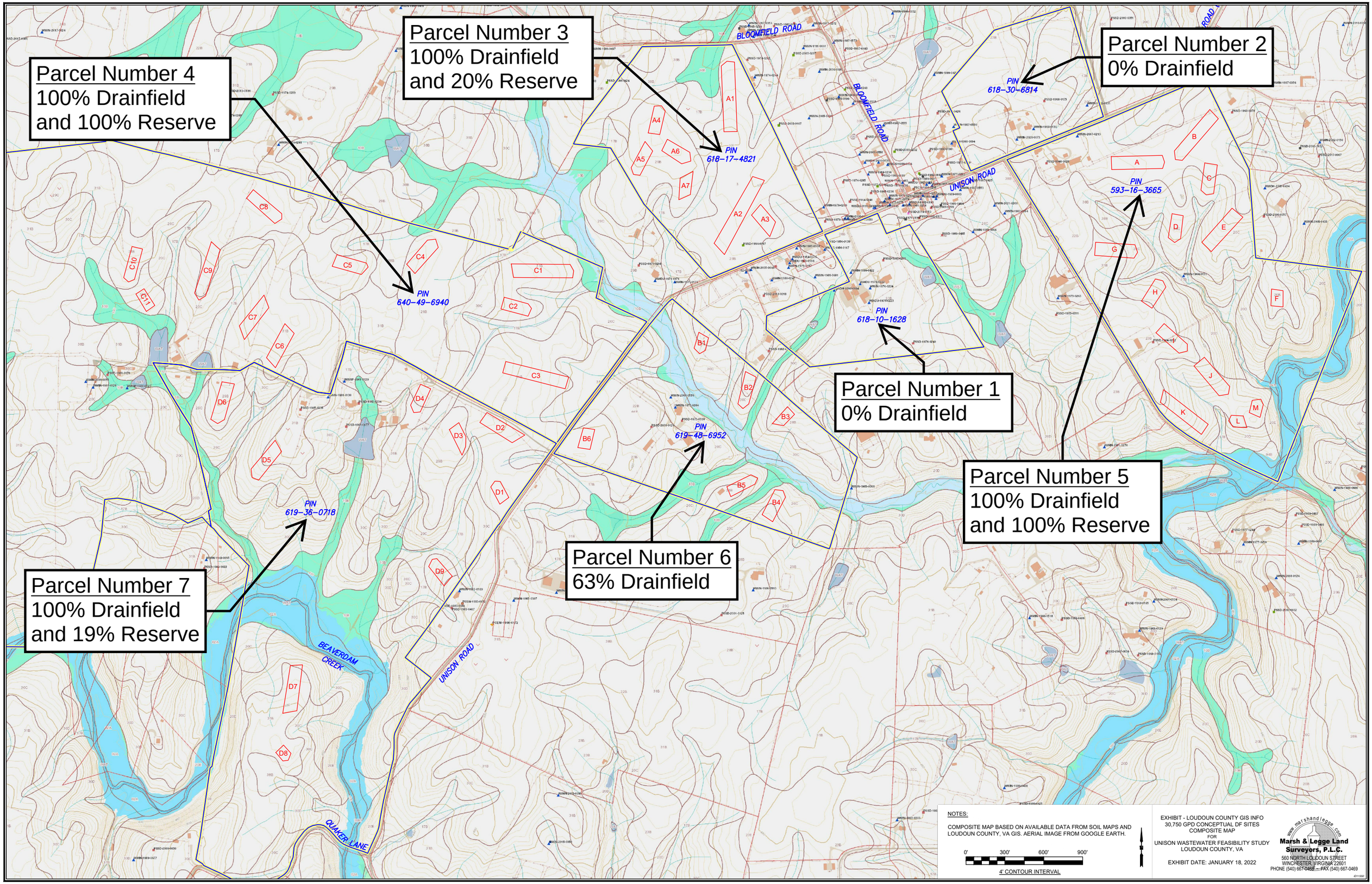
Soil Analysis

Drainfield Area

Dewberry contracted Marsh & Legge to further investigate up to seven (7) parcels, which were previously identified in **Table 2**. With the provided sewage flow of 30,750 gpd and an assumed percolation rate of 75 minutes per inch, Marsh & Legge determined the required primary drainfield area to be 161,850 square feet, which is approximately four (4) acres.

In addition to the primary drainfield area, a 100% reserve drainfield site is also required per the Sewage Handling and Disposal Regulations and Chapter 1066 of the Loudoun County Code. The reserve drainfield would not be installed, but is required to be preserved as a secondary drainfield site in the event that the installed primary drainfield fails. And no driveways, permanent structures, underground utilities, or any other physical disturbances are allowed to be sited in this area. The total area required for both the primary drainfield and reserve drainfield is approximately eight (8) acres.

It should be noted that the primary drainfield area (and consequently the reserve drainfield area) size was calculated by Marsh & Legge assuming treatment level 2 (TL-2) requirements for the five-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS), as outlined in the Commonwealth of Virginia


Parcel Number 4
100% Drainfield
and 100% Reserve
Parcel Number 3
100% Drainfield
and 20% Reserve
Parcel Number 2
0% Drainfield
Parcel Number 1
0% Drainfield
Parcel Number 5
100% Drainfield
and 100% Reserve
Parcel Number 6
63% Drainfield
Parcel Number 7
100% Drainfield
and 19% Reserve
PIN 640-49-6940
PIN 618-17-4821
PIN 618-30-6814
PIN 593-16-3665
PIN 618-10-1628
PIN 619-48-6952
PIN 619-36-0718
BLOOMFIELD ROAD
UNISON ROAD
BEAVERDAM CREEK
QUAKER LANE
NOTES:
COMPOSITE MAP BASED ON AVAILABLE DATA FROM SOIL MAPS AND LOUDOUN COUNTY, VA GIS. AERIAL IMAGE FROM GOOGLE EARTH.
0' 300' 600' 900'
4' CONTOUR INTERVAL
EXHIBIT - LOUDOUN COUNTY GIS INFO
30,750 GPD CONCEPTUAL DF SITES
COMPOSITE MAP
FOR
UNISON WASTEWATER FEASIBILITY STUDY
LOUDOUN COUNTY, VA
EXHIBIT DATE: JANUARY 18, 2022
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Disposal Limits

In addition to the required drainfield area discussed above, a nitrogen dilution buffer area will also be required to surround the proposed drainfield site. This additional area acts as a buffer and is where rain can infiltrate into the soil and dilute the nitrate into the ground water. No installation of the mass drainfield system or land disturbance can occur in the buffer area. And no structures can be built on the dilution area for the life of the mass drainfield.

According to the Commonwealth of Virginia Statute 12VAC5-613-90B for large Alternative Onsite Sewage Systems (AOSS) that treat greater than 10,000 gpd, it must be demonstrated that the TN concentration in the effluent sewage (leaving the WWTP) prior to distribution to the primary drainfield (surrounded by a dilution area) is less than or equal to 8 mg/L. Furthermore, TN concentration in the groundwater cannot exceed 5 mg/L at the project boundary, which is defined by the edge of the nitrogen dilution area. Alternatively, it must be demonstrated through in situ monitoring within 24 inches of the point of effluent application in the soil that the TN concentration is less than or equal to 5 mg/L.

For the purposes of this technical memorandum, it is assumed that the treatment technology selected will be capable of treating the effluent sewage to 8 mg/L and that a nitrogen dilution area will be required to meet 5 mg/L TN concentration at the project boundary.

Dilution Area

The VDH GMP 1995-02 was used to calculate the estimated land requirements for dilution area. This method is based on the following parameters:

1. Inches of rainfall per year
2. Infiltration rate
3. Pre-existing TN concentration
4. Design flow

According to the National Oceanic and Atmospheric Administration (NOAA), the average rainfall per year in Loudoun County is approximately 40-inches. In accordance with the VDH GMP 1995-02, it can be assumed that half of this rainfall (20 inches) is absorbed. For the purpose of this technical memorandum, it is assumed that there is no pre-existing TN concentration in the ground. As previously described, the design flow is 30,750 gpd, and it is assumed that TN concentration at the effluent pipe is 8 mg/L.

The parameter values and two (2) equations (provided in the VDH GMP 1995-02) used to calculate the dilution area are summarized in **Table 5**. The dilution area was determined by trial and error, as numerous acreage values were tested (in Equation 1) until the resulting nitrate concentration leaving the site (calculated with Equation 2) was 5.0 mg/L. The required area for nitrogen dilution is 12.5 acres.

Table 5 – Nitrogen Dilution Area Calculations

Equation 1: Rainwater Infiltration		
R (inches) x D (acres) x 74 = Rainwater Infiltration = Gallons of Dilution		
R = Absorbed rainfall in inches (50% of annual rainfall)	20	inches
D = Acres required for Nitrogen Dilution	**12.5**	**Acres**
Conversion Factor	74	converts inputs (R x D) to gpd
Rainwater Infiltration (Gallons of Dilution)	18,450	gpd
Equation 2: Nitrate Concentration Leaving the Site		
Gallons of Wastewater / (Gallons of Wastewater + Gallons of Dilution) x Concentration of Nitrogen = Nitrate Concentration Leaving the Site (mg/L)		
Gallons of Dilution (calculated in Equation 1)	18,450	gpd
Design Flow (Gallons of Wastewater)	30,750	gpd
TN Concentration (of WWTP effluent)	8	mg/L
Nitrate Concentration Leaving the Site	5	mg/L

Estimated Total Land Requirement

As noted above, the drainfield investigation performed by Marsh & Legge assumed a conservative Treatment Level (TL-2), which would require a larger drainfield area. It should be noted that based on treatment technologies available, it can reasonably be assumed that the wastewater could be treated to the more stringent TL-3 and a smaller drainfield could be sited. Treatment to a TL-3 has more stringent BOD and TSS requirements than TL-2, as outlined in the Commonwealth of Virginia Statute 12VAC5-613-10 and shown in **Table 6**.

Table 6 – Treatment Level BOD_5 and TSS Requirements

Treatment Level	BOD	TSS
TL-2	30 mg/L	30 mg/L
TL-3	10 mg/L	10 mg/L

Should wastewater be treated to meet the TL-3 requirements, the primary drainfield area (and consequently the reserve drainfield area) size could be reduced to approximately 128,125 square feet (approximately 3 acres).

Table 7 details the total approximate estimated land required, which includes the primary drainfield area, reserve drainfield area, dilution area and WWTP area (assumed to be 0.5 acres) for both TL-2 and TL-3.

Table 7 – Estimated Land Requirements

Treatment Level	Primary Drainfield Area (Acres)	Reserve Drainfield Area (Acres)	Nitrogen Dilution Area (Acres)	WWTP Area (Acres)	Total Land Required (Acres)
TL-2	4	4	12.5	0.5	21
TL-3	3	3	12.5	0.5	19

As shown in the table, meeting TL-3 requirements results in a decrease of approximately two (2) acres of total required drainfield area (primary and reserve) compared to TL-2 treatment. It is reasonable to assume that the wastewater treatment plant sited will treat the wastewater to BOD and TSS levels to meet TL-3 requirements. Therefore, for the remainder of the study and cost estimating, it will be assumed that the total required drainfield area would be sized according to TL-3 criteria.

It should also be noted that the land required for the nitrogen dilution areas is dependent on the flow and TN treatment level of the effluent leaving the WWTP. If the effluent leaving the WWTP were to be treated to a TN concentration of less than 8 mg/L (assumed for the calculations), a smaller nitrogen dilution area would be allowed.

Additionally, fencing may be required around the primary drainfield, reserve drainfield, and other onsite system components.

Conclusion

Based on a preliminary review of soils and existing features for parcels within and near the Unison study boundary, seven (7) parcels were provided for Marsh & Legge for soil analysis to determine the potential for siting a subsurface discharge drainfield.

Marsh & Legge calculated required drainfield area assuming a standard soil percolation rate of 75 mpi and TL-2 requirements. It was determined that in order to handle the estimated future sewage flow of 30,750 gpd, a primary drainfield area of approximately four (4) acres would be required. In addition to the primary drainfield, a 100% reserve drainfield area would also be required. Furthermore, an additional 12.5 acres would be required for nitrogen dilution area. The WWTP area is assumed to be 0.5 acres. Based on these

calculations and assumptions, a total of 21 acres of land would be required to site a subsurface discharge wastewater treatment facility to serve the Village of Unison.

The total required land area can be reduced by approximately 2 acres if the wastewater is treated to meet the more stringent TL-3 requirements. In the case of TL-3, the total land required is reduced to 19 acres. Based on available treatment technologies, it is reasonable to assume that the wastewater will be treated to meet the TL-3 requirements. Therefore, this land requirement will be utilized within the subsequent report and for cost estimating.

As a result of this soil analysis**,** the following three (3) options could potentially be utilized for drainfield sites:

- Parcel Number 4
- Parcel Number 5
- Combination – Portion of Parcel Number 4 & 7

Parcel numbers 4 and 7 have both a Conservation Easement and Virginia Outdoors Foundation (VOF) Easement. Additional study of the easement language will be required to determine the limitations on these properties.

This information is preliminary and may change with a detailed soil evaluation and site analysis.

Attachments:

Attachment A: Soil Breakdown by Parcel

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DRAINFIELD POTENTIAL SUMMARY

(PIN 593-16-3665)

This conceptual soil investigation was conducted using available Loudoun County GIS information on property to the southwest of Unison on the northerly side of Fiddlers Green Lane and the westerly side of Unison Road (PIN 593-16-3665).

Potential onsite wastewater disposal (drainfield) sites were determined by selecting the "best" suitable landscapes (topography) with the "best" suitable soils found in this study area. These sites were determined using the Virginia Department of Health's *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code.

Suitable soils for drainfield and reserve drainfield sites were found on side slopes and ridgetops on this parcel. (See Page 4 and exhibits showing potential drainfield areas dated January 18, 2022.) The capacity for the drainfield site is 30,750 gallons per day (includes 100% reserve drainfield requirements – additional 30,750 gallons per day).

The 100% reserve drainfield site is required in the *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code. This area is not installed but is set aside and preserved in case the installed drainfield fails to function properly. The reserve drainfield area is used as a repair installation site for the original drainfield. Limitations on the reserve drainfield include no physical disturbance (i.e., driveways, permanent structures, underground utilities, etc.).

The mass drainfield required for this project would be a large alternative pretreated system with drip dispersal installed at 18 to 20 inches. A pretreated wastewater system refers to treatment works designed to prepare sewage for disposal in a soil medium. After the septic tank effluent has been pretreated (cleaned up), it is dispersed into the drainfield area. A pump

is used to dose the dispersal field consisting of drip tubing installed into the soil. The microorganisms living in the soil also help to clean up the effluent.

Nitrogen dilution buffer areas will be required around the proposed drainfield sites (to be determined by Dewberry). The dilution buffer area is a requirement in the regulations to protect the ground water from exceeding nitrate concentration levels considered to be safe. It is where rain can infiltrate into the soil and dilute the nitrate in the ground water. No installation of the mass drainfield system or land disturbance occurs in the buffer area. No structures can be built on the dilution area for the life of the mass drainfield. Ground water monitoring wells may be required for this project as determined by the Virginia Department of Health's discretion. The monitoring wells would be used for testing (fecal coliform organisms, nitrates, etc.) to ensure that ground water is not adversely impacted by the drainfield system.

Fencing may be required around the proposed drainfield, reserve drainfield, and other onsite system components.

SUMMARY OF SOIL CHARACTERISTICS AND USE POTENTIAL

(PIN 593-16-3665)

Soils of the Purcellville series (23B) were mapped on this property in the conceptual drainfield areas. Purcellville soils are very deep and well drained. They formed in residuum derived from diorite, biotite schist and greenstone in the Blue Ridge Uplands. Slopes ranged from 2 to 7 percent. Inclusions of soils shallower to rock may occur in this mapping unit. This soil is listed as good potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

Soils of the Philomont (31B) and Tankerville series (31B) were mapped on this property in the conceptual drainfield areas. Philomont soils are very deep and well drained. Tankerville soils are moderately deep and well drained. They formed in residuum derived from weathered gneissic and granite rocks in highly dissected portions of the Blue Ridge Uplands. Slopes ranged from 2 to 7 percent. Inclusions of soils shallower to rock may occur in this mapping unit. These soils are listed as good potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

Soils of the Purcellville and Tankerville series (20B, 20C) were mapped on this property in the conceptual drainfield areas. Tankerville soils are moderately deep and well drained. Purcellville soils are very deep and well drained. They formed in residuum derived from weathered gneissic and granite rocks in highly dissected portions of the Blue Ridge Uplands. Slopes ranged from 2 to 7 percent (20B) and from 7 to 15 percent (20C). Inclusions of soils shallower to rock may occur in this mapping unit. These soils are listed as fair potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

DRAINFIELD CAPACITY

(PIN 593-16-3665)

The projected sewage flows for the Unison project are as follows:

Residential – 28,875 gallons per day (GPD), One Church – 1875 gallons per day (GPD) = 30, 750 gallons per day (GPD)

Size requirements for the mass drainfield are approximately 161,850 square feet of dispersal area (percolation rate of 75 minutes per inch)

Potential Drainfield Sites:

Site A:	100' x 400' = 40,000 square feet
Site B:	100' x 400' = 40,000 square feet
Site C:	100' x 200' = 20,000 square feet
Site D:	100' x 200' = 20,000 square feet
Site E:	100' x 350' = 35,000 square feet
Site F:	100' x 130' = 13,000 square feet
Total:	**168,000 square feet**

Potential 100% Reserve Drainfield Sites:

Site G:	100' x 300' = 30,000 square feet
Site H:	100' x 200' = 27,000 square feet
Site I:	100' x 250' = 30,000 square feet
Site J:	100' x 300' = 37,000 square feet
Site K:	100' x 400' = 25,000 square feet
Site L:	100' x 100' = 10,000 square feet
Site M:	100' x 100' = 10,000 square feet
Total:	**165,000 square feet**

Proposed dispersal method for the mass drainfield is drip irrigation with an installation depth of approximately 18 to 20 inches.

Fencing may be required around the proposed drainfield, proposed reserve drainfield and other onsite system components.

There are no known existing wells or drainfields that will impact the location of the proposed mass drainfield sites.

This information is preliminary and may change with a detailed soil evaluation and site analysis.

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DRAINFIELD POTENTIAL SUMMARY

(PIN 618-10-1628)

This conceptual soil investigation was conducted using available Loudoun County GIS information on property to the south of Unison on the southerly side of Unison Road (PIN 618-10-1628). The parcel contains 25 acres.

Potential onsite wastewater disposal (drainfield) sites were determined by selecting the "best" suitable landscapes (topography) with the "best" suitable soils found in this study area. These sites were determined using the Virginia Department of Health's *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code.

Suitable soils for drainfield and reserve drainfield sites were found on side slopes and ridge tops on this parcel. The capacity for the drainfield site is 30,750 gallons per day (includes 100% reserve drainfield requirements – additional 30,750 gallons per day).

Size requirements for the mass drainfield are approximately 161,850 square feet of dispersal area (percolation rate of 75 minutes per minute). An additional 161,850 square feet of dispersal area is required for the 100% reserve drainfield. Potential drainfield sites totaled approximately 45,000 square feet.

Potential drainfield and reserve drainfield sites are not shown on this parcel. The parcel is not large enough to support a mass drainfield system of this magnitude.

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DRAINFIELD POTENTIAL SUMMARY

(PIN 618-17-4821)

This conceptual soil investigation was conducted using available Loudoun County GIS information on property to the east of Unison on the northerly side of Unison Road and the southerly side of Bloomfield Road (PIN 618-17-4821). The parcel contains 45.61 acres.

Potential onsite wastewater disposal (drainfield) sites were determined by selecting the "best" suitable landscapes (topography) with the "best" suitable soils found in this study area. These sites were determined using the Virginia Department of Health's *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code.

Suitable soils for drainfield and reserve drainfield sites were found on side slopes on this parcel. (See exhibits showing potential drainfield areas dated January 18, 2022.) The capacity for the drainfield site is 30,750 gallons per day (includes 100% reserve drainfield requirements – additional 30,750 gallons per day).

The 100% reserve drainfield site is required in the *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code. This area is not installed but is set aside and preserved in case the installed drainfield fails to function properly. The reserve drainfield area is used as a repair installation site for the original drainfield. Limitations on the reserve drainfield include no physical disturbance (i.e., driveways, permanent structures, underground utilities, etc.). **The 100% reserve drainfield requirement could not be achieved on this parcel. Conceptually, only a 20% reserve drainfield site was located (see Page 4 and exhibit dated January 18, 2022).**

The mass drainfield required for this project would be a large alternative pretreated system with drip dispersal installed at 18 to 20 inches. A pretreated wastewater system refers to treatment work designed to prepare sewage for disposal in a soil medium. After the septic

tank effluent has been pretreated (cleaned up), it is dispersed into the drainfield area. A pump is used to dose the dispersal field consisting of drip tubing installed into the soil. The microorganisms living in the soil also help to clean up the effluent.

Nitrogen dilution buffer areas will be required around the proposed drainfield sites (to be determined by Dewberry). The dilution buffer area is a requirement in the regulations to protect the ground water from exceeding nitrate concentration levels considered to be safe. It is where rain can infiltrate into the soil and dilute the nitrate in the ground water. No installation of the mass drainfield system or land disturbance occurs in the buffer area. No structures can be built on the dilution area for the life of the mass drainfield. Ground water monitoring wells may be required for this project as determined by the Virginia Department of Health's discretion. The monitoring wells would be used for testing (fecal coliform organisms, nitrates, etc.) to ensure that ground water is not adversely impacted by the drainfield system.

Fencing may be required around the proposed drainfield, reserve drainfield, and other onsite system components.

SUMMARY OF SOIL CHARACTERISTICS AND USE POTENTIAL

(PIN 618-17-4821)

Soils of the Eubanks series (28B) were mapped on this property in the conceptual drainfield areas. They are very deep and well drained. They formed in residuum derived from weathered fine to medium grained granodiorites in the Blue Ridge Uplands. Slopes ranged from 2 to 7 percent. Inclusions of soils shallower to rock may occur in this mapping unit. This soil is listed as good potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

Soils of the Eubanks series, stony phase (29B), were mapped on this property in the conceptual drainfield areas (see above for description). These soils have a stony surface layer that may impact drainfield installation. This soil is listed as good potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia..*

DRAINFIELD CAPACITY

(PIN 618-17-4821)

The projected sewage flows for the Unison project are as follows:

Residential – 28,875 gallons per day (GPD), One Church – 1875 gallons per day (GPD) = 30,750 gallons per day (GPD)

Size requirements for the mass drainfield are approximately 161,850 square feet of dispersal area (percolation rate of 75 minutes per inch).

Potential Drainfield Sites:	
Site A1:	100' x 500' = 50,000 square feet
Site A2:	100' x 600' = 60,000 square feet
Site A3:	100' x 200' = 20,000 square feet
Site A4:	100' x 170' = 17,000 square feet
Site A5:	100' x 210' = 21,000 square feet
Total:	**168,000 square feet**
Potential 100% Reserve Drainfield Sites:	
Site A6:	100' x 180' = 18,000 square feet
Site A7:	100' x 150' = 15,000 square feet
Total:	**33,000 square feet**

Proposed dispersal method for the mass drainfield is drip irrigation with an installation depth of approximately 18 to 20 inches.

Fencing may be required around the proposed drainfield, proposed reserve drainfield and other onsite system components.

Proposed drainfields and reserve drainfields were conceptually located in one area to minimize the impact on this property.

There are no known existing wells or drainfields that will impact the location of the proposed mass drainfield site.

This information is preliminary and may change with a detailed soil evaluation and site analysis.

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DRAINFIELD POTENTIAL SUMMARY

(PIN 618-30-6814)

This conceptual soil investigation was conducted using available Loudoun County GIS information on property to the south of Unison on the southerly side of Unison Road (PIN 618-30-6814). The parcel contains 21.85 acres.

Potential onsite wastewater disposal (drainfield) sites were determined by selecting the "best" suitable landscapes (topography) with the "best" suitable soils found in this study area. These sites were determined using the Virginia Department of Health's *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code.

Suitable soils for drainfield and reserve drainfield sites were found on side slopes and ridge tops on this parcel. The capacity for the drainfield site is 30,750 gallons per day (includes 100% reserve drainfield requirements – additional 30,750 gallons per day).

Size requirements for the mass drainfield are approximately 161,850 square feet of dispersal area (percolation rate of 75 minutes per minute). An additional 161,850 square feet of dispersal area is required for the 100% reserve drainfield. Potential drainfield sites totaled approximately 95,000 square feet.

Potential drainfield and reserve drainfield sites are not shown on this parcel. The parcel is not large enough to support a mass drainfield system of this magnitude.

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DRAINFIELD POTENTIAL SUMMARY

(PIN 619-36-0718)

This conceptual soil investigation was conducted using available Loudoun County GIS information on property to the south of Unison on the southerly side of Fiddlers Green Lane and the westerly side of Unison Road (PIN 619-36-0718). The parcel contains 158.49 acres.

Potential onsite wastewater disposal (drainfield) sites were determined by selecting the "best" suitable landscapes (topography) with the "best" suitable soils found in this study area. These sites were determined using the Virginia Department of Health's *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code.

Suitable soils for drainfield and reserve drainfield sites were found on side slopes and ridge tops on this parcel. (See exhibits showing potential drainfield areas dated January 18, 2022.) The capacity for the drainfield site is 30,750 gallons per day (includes 100% reserve drainfield requirements – additional 30,750 gallons per day).

The 100% reserve drainfield site is required in the *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code. This area is not installed but is set aside and preserved in case the installed drainfield fails to function properly. The reserve drainfield area is used as a repair installation site for the original drainfield. Limitations on the reserve drainfield include no physical disturbance (i.e., driveways, permanent structures, underground utilities, etc.). **The 100% reserve drainfield requirement could not be achieved on this parcel. Conceptually, only a 19% reserve drainfield site was located (see Page 4 and exhibit dated January 18, 2022).**

The mass drainfield required for this project would be a large alternative pretreated system with drip dispersal installed at 18 to 20 inches. A pretreated wastewater system refers to treatment work designed to prepare sewage for disposal in a soil medium. After the septic

tank effluent has been pretreated (cleaned up), it is dispersed into the drainfield area. A pump is used to dose the dispersal field consisting of drip tubing installed into the soil. The microorganisms living in the soil also help to clean up the effluent.

Nitrogen dilution buffer areas will be required around the proposed drainfield sites (to be determined by Dewberry). The dilution buffer area is a requirement in the regulations to protect the ground water from exceeding nitrate concentration levels considered to be safe. It is where rain can infiltrate into the soil and dilute the nitrate in the ground water. No installation of the mass drainfield system or land disturbance occurs in the buffer area. No structures can be built on the dilution area for the life of the mass drainfield. Ground water monitoring wells may be required for this project as determined by the Virginia Department of Health's discretion. The monitoring wells would be used for testing (fecal coliform organisms, nitrates, etc.) to ensure that ground water is not adversely impacted by the drainfield system.

Fencing may be required around the proposed drainfield, reserve drainfield, and other onsite system components.

SUMMARY OF SOIL CHARACTERISTICS AND USE POTENTIAL

(PIN 619-36-0718)

Soils of the Eubanks series, stony phase (29B) were mapped on this property in the conceptual drainfield areas. They are very deep and well drained. They formed in residuum derived from weathered fine to medium grained granodiorites in the Blue Ridge Uplands. Slopes ranged from 2 to 7 percent. These soils have a stony surface layer that may impact drainfield installation. Inclusions of soils shallower to rock may occur in this mapping unit. This soil is listed as good potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

Soils of the Philomont (31B) and Tankerville series (31B) were mapped on this property in the conceptual drainfield areas. Philomont soils are very deep and well drained. Tankerville soils are moderately deep and well drained. They formed in residuum derived from weathered gneissic and granite rocks in highly dissected portions of the Blue Ridge Uplands. Slopes ranged from 2 to 7 percent. Inclusions of soils shallower to rock may occur in this mapping unit. These soils are listed as good potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

Soils of the Tankerville (30C) and Philomont series (30C) were mapped on this property in the conceptual drainfield areas. Tankerville soils are moderately deep and well drained. Philomont soils are very deep and well drained. They formed in residuum derived from weathered gneissic and granite rocks in highly dissected portions of the Blue Ridge Uplands. Slopes ranged from 7 to 15 percent. Inclusions of soils shallower to rock may occur in this

mapping unit. These soils are listed as fair potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

DRAINFIELD CAPACITY

(PIN 619-36-0718)

The projected sewage flows for the Unison project are as follows:

Residential – 28,875 gallons per day (GPD), One Church – 1875 gallons per day (GPD) = 30, 750 gallons per day (GPD)

Size requirements for the mass drainfield are approximately 161,850 square feet of dispersal area (percolation rate of 75 minutes per inch)

Potential Drainfield Sites:	
Site D1:	100' x 150' = 15,000 square feet
Site D2:	100' x 300' = 30,000 square feet
Site D3:	100' x 120' = 12,000 square feet
Site D4:	100' x 200' = 20,000 square feet
Site D5:	100' x 280' = 28,000 square feet
Site D6:	100' x 300' = 30,000 square feet
Site D7:	100' x 350' = 35,000 square feet
Total:	**170,000 square feet**
Potential 100% Reserve Drainfield Sites:	
Site D8:	100' x 100' = 10,000 square feet
Site D9:	100' x 200' = 20,000 square feet
Total:	**30,000 square feet**

Proposed dispersal method for the mass drainfield is drip irrigation with an installation depth of approximately 18 to 20 inches.

Fencing may be required around the proposed drainfield, proposed reserve drainfield and other onsite system components.

Proposed drainfields and reserve drainfields were conceptually located in one area to minimize the impact on this property.

There are no known existing wells or drainfields that will impact the location of the proposed mass drainfield site.

This information is preliminary and may change with a detailed soil evaluation and site analysis.

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DRAINFIELD POTENTIAL SUMMARY

(PIN 640-49-6940)

This conceptual soil investigation was conducted using available Loudoun County GIS information on property to the southwest of Unison on the northerly side of Fiddlers Green Lane and the westerly side of Unison Road (PIN 640-49-6940).

Potential onsite wastewater disposal (drainfield) sites were determined by selecting the "best" suitable landscapes (topography) with the "best" suitable soils found in this study area. These sites were determined using the Virginia Department of Health's *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code.

Suitable soils for drainfield and reserve drainfield sites were found on side slopes and ridge tops on this parcel. (See exhibits showing potential drainfield areas dated January 18, 2022.) The capacity for the drainfield site is 30,750 gallons per day (includes 100% reserve drainfield requirements – additional 30,750 gallons per day).

The 100% reserve drainfield site is required in the *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code. This area is not installed but is set aside and preserved in case the installed drainfield fails to function properly. The reserve drainfield area is used as a repair installation site for the original drainfield. Limitations on the reserve drainfield include no physical disturbance (i.e., driveways, permanent structures, underground utilities, etc.).

The mass drainfield required for this project would be a large alternative pretreated system with drip dispersal installed at 18 to 20 inches. A pretreated wastewater system refers to treatment work designed to prepare sewage for disposal in a soil medium. After the septic tank effluent has been pretreated (cleaned up), it is dispersed into the drainfield area. A pump

is used to dose the dispersal field consisting of drip tubing installed into the soil. The microorganisms living in the soil also help to clean up the effluent.

Nitrogen dilution buffer areas will be required around the proposed drainfield sites (to be determined by Dewberry). The dilution buffer area is a requirement in the regulations to protect the ground water from exceeding nitrate concentration levels considered to be safe. It is where rain can infiltrate into the soil and dilute the nitrate in the ground water. No installation of the mass drainfield system or land disturbance occurs in the buffer area. No structures can be built on the dilution area for the life of the mass drainfield. Ground water monitoring wells may be required for this project as determined by the Virginia Department of Health's discretion. The monitoring wells would be used for testing (fecal coliform organisms, nitrates, etc.) to ensure that ground water is not adversely impacted by the drainfield system.

Fencing may be required around the proposed drainfield, reserve drainfield, and other onsite system components.

SUMMARY OF SOIL CHARACTERISTICS AND USE POTENTIAL

(PIN 640-49-6940)

Soils of the Eubanks series (28B) were mapped on this property in the conceptual drainfield areas. They are very deep and well drained. They formed in residuum derived from weathered fine to medium grained granodiorites in the Blue Ridge Uplands. Slopes ranged from 2 to 7 percent. Inclusions of soils shallower to rock may occur in this mapping unit. This soil is listed as good potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

Soils of the Eubanks series, stony phase (29B), were mapped on this property in the conceptual drainfield areas (see above for description). These soils have a stony surface layer that may impact drainfield installation. This soil is listed as good potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

Soils of the Philomont (31B) and Tankerville series (31B) were mapped on this property in the conceptual drainfield areas. Philomont soils are very deep and well drained. Tankerville soils are moderately deep and well drained. They formed in residuum derived from weathered gneissic and granite rocks in highly dissected portions of the Blue Ridge Uplands. Slopes ranged from 2 to 7 percent. Inclusions of soils shallower to rock may occur in this mapping unit. These soils are listed as good potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

Soils of the Tankerville (30C) and Philomont series (30C) were mapped on this property in the conceptual drainfield areas. Tankerville soils are moderately deep and well drained. Philomont soils are very deep and well drained. They formed in residuum derived from weathered gneissic and granite rocks in highly dissected portions of the Blue Ridge Uplands.

Slopes ranged from 7 to 15 percent. Inclusions of soils shallower to rock may occur in this mapping unit. These soils are listed as fair potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

DRAINFIELD CAPACITY

(PIN 640-49-6940)

The projected sewage flows for the Unison project are as follows:

Residential – 28,875 gallons per day (GPD), One Church – 1875 gallons per day (GPD) = 30, 750 gallons per day (GPD)

Size requirements for the mass drainfield are approximately 161,850 square feet of dispersal area (percolation rate of 75 minutes per inch)

Potential Drainfield Sites:

Site C1:	100' x 320' = 32,000 square feet
Site C2:	100' x 350' = 35,000 square feet
Site C3:	100' x 150' = 15,000 square feet
Site C4:	100' x 250' = 25,000 square feet
Site C5:	100' x 250' = 25,000 square feet
Total:	**165,000 square feet**

Potential 100% Reserve Drainfield Sites:

Site C6:	100' x 300' = 30,000 square feet
Site C7:	100' x 270' = 27,000 square feet
Site C8:	100' x 300' = 30,000 square feet
Site C9:	100' x 370' = 37,000 square feet
Site C10:	100' x 250' = 25,000 square feet
Site C11:	100' x 150' = 15,000 square feet
Total:	**164,000 square feet**

Proposed dispersal method for the mass drainfield is drip irrigation with an installation depth of approximately 18 to 20 inches.

Fencing may be required around the proposed drainfield, proposed reserve drainfield and other onsite system components.

There are no known existing wells or drainfields that will impact the location of the proposed mass drainfield sites.

This information is preliminary and may change with a detailed soil evaluation and site analysis.

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DRAINFIELD POTENTIAL SUMMARY

(PIN 619-48-6952)

This conceptual soil investigation was conducted using available Loudoun County GIS information on property to the south of Unison on the westerly side of Unison Road (PIN 619-48-6952). The parcel contains 52.1 acres.

Potential onsite wastewater disposal (drainfield) sites were determined by selecting the "best" suitable landscapes (topography) with the "best" suitable soils found in this study area. These sites were determined using the Virginia Department of Health's *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code.

Suitable soils for drainfield and reserve drainfield sites were found on side slopes and ridge tops on this parcel. (See exhibits showing potential drainfield areas dated January 18, 2022.) The capacity for the drainfield site is 30,750 gallons per day (includes 100% reserve drainfield requirements – additional 30,750 gallons per day).

The 100% reserve drainfield site is required in the *Sewage Handling and Disposal Regulations* and Chapter 1066 of the Loudoun County Code. This area is not installed but is set aside and preserved in case the installed drainfield fails to function properly. The reserve drainfield area is used as a repair installation site for the original drainfield. Limitations on the reserve drainfield include no physical disturbance (i.e., driveways, permanent structures, underground utilities, etc.). **The drainfield requirement and the 100% reserve drainfield requirement could not be achieved on this parcel. Conceptually, only 63% of the drainfield site was located (see Page 4 and exhibit dated January 18, 2022).**

The mass drainfield required for this project would be a large alternative pretreated system with drip dispersal installed at 18 to 20 inches. A pretreated wastewater system refers to treatment work designed to prepare sewage for disposal in a soil medium. After the septic

tank effluent has been pretreated (cleaned up), it is dispersed into the drainfield area. A pump is used to dose the dispersal field consisting of drip tubing installed into the soil. The microorganisms living in the soil also help to clean up the effluent.

Nitrogen dilution buffer areas will be required around the proposed drainfield sites (to be determined by Dewberry). The dilution buffer area is a requirement in the regulations to protect the ground water from exceeding nitrate concentration levels considered to be safe. It is where rain can infiltrate into the soil and dilute the nitrate in the ground water. No installation of the mass drainfield system or land disturbance occurs in the buffer area. No structures can be built on the dilution area for the life of the mass drainfield. Ground water monitoring wells may be required for this project as determined by the Virginia Department of Health's discretion. The monitoring wells would be used for testing (fecal coliform organisms, nitrates, etc.) to ensure that ground water is not adversely impacted by the drainfield system.

Fencing may be required around the proposed drainfield, reserve drainfield, and other onsite system components.

SUMMARY OF SOIL CHARACTERISTICS AND USE POTENTIAL

(PIN 619-48-6952)

Soils of the Eubanks series (28B) were mapped on this property in the conceptual drainfield areas. They are very deep and well drained. They formed in residuum derived from weathered fine to medium grained granodiorites in the Blue Ridge Uplands. Slopes ranged from 2 to 7 percent. Inclusions of soils shallower to rock may occur in this mapping unit. This soil is listed as good potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

Soils of the Philomont (31B) and Tankerville series (31B) were mapped on this property in the conceptual drainfield areas. Philomont soils are very deep and well drained. Tankerville soils are moderately deep and well drained. They formed in residuum derived from weathered gneissic and granite rocks in highly dissected portions of the Blue Ridge Uplands. Slopes ranged from 2 to 7 percent. Inclusions of soils shallower to rock may occur in this mapping unit. These soils are listed as good potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

Soils of the Tankerville (30C) and Philomont series (30C) were mapped on this property in the conceptual drainfield areas. Tankerville soils are moderately deep and well drained. Philomont soils are very deep and well drained. They formed in residuum derived from weathered gneissic and granite rocks in highly dissected portions of the Blue Ridge Uplands. Slopes ranged from 7 to 15 percent. Inclusions of soils shallower to rock may occur in this

mapping unit. These soils are listed as fair potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia.*

Soils of the Purcellville (20C) and Tankerville series (20C) were mapped on this property in the conceptual drainfield areas. Purcellville soils are very deep and well drained and Tankerville soils are moderately deep and well drained. They formed in residuum derived from diorite, biotite schist and greenstone schist in the Blue Ridge Uplands. Slopes ranged from 7 to 15 percent. Inclusions of soils shallower to rock may occur in this mapping unit. This soil is listed as fair potential for conventional septic tank drainfields in the *Interpretive Guide to the Use of Soil Maps, Loudoun County, Virginia*

DRAINFIELD CAPACITY

(PIN 619-48-6952)

The projected sewage flows for the Unison project are as follows:

Residential – 28,875 gallons per day (GPD), One Church – 1875 gallons per day (GPD) = 30, 750 gallons per day (GPD)

Size requirements for the mass drainfield are approximately 161,850 square feet of dispersal area (percolation rate of 75 minutes per inch)

Potential Drainfield Sites:

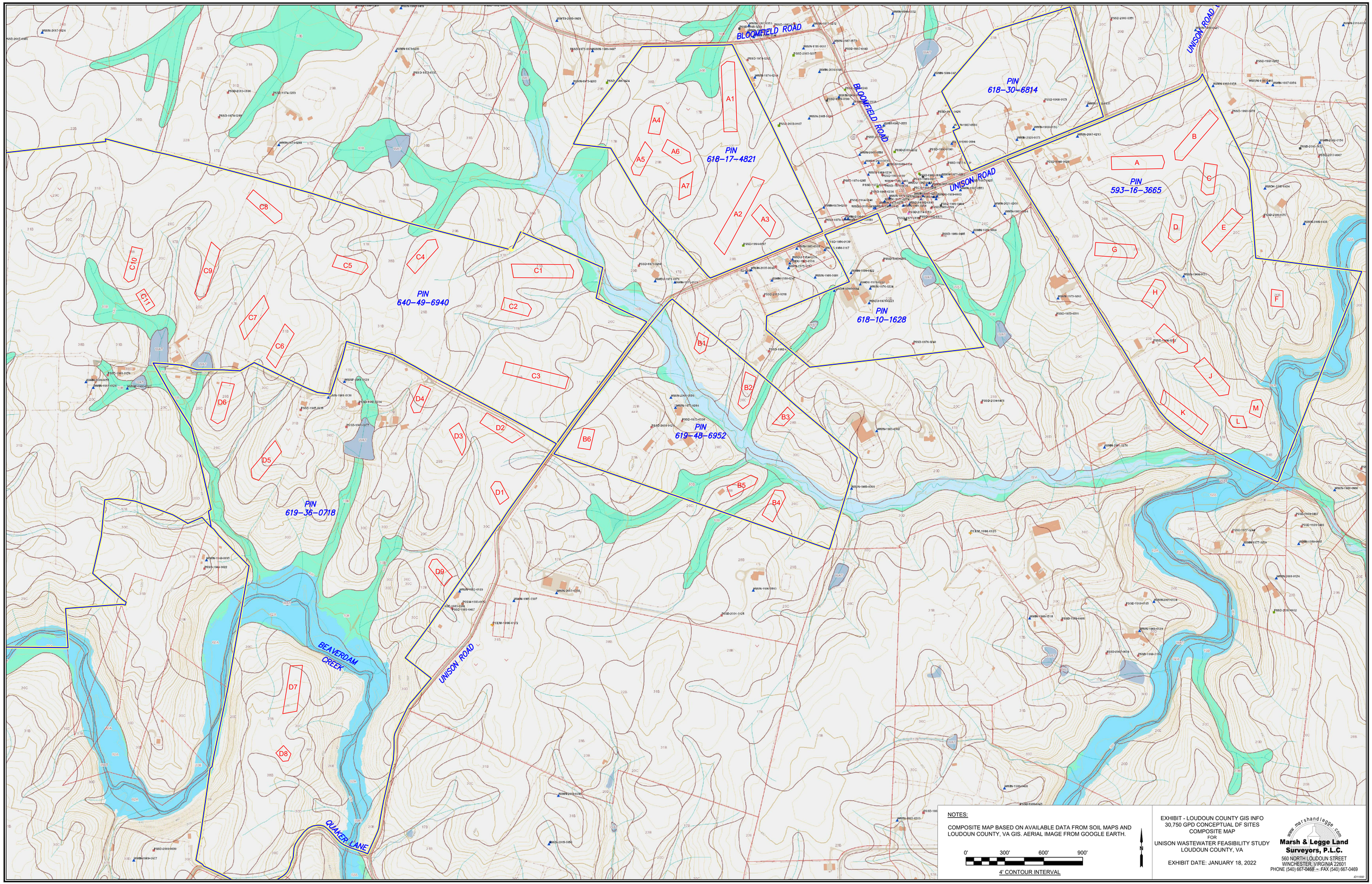
Site B1:	100' x 100' = 10,000 square feet
Site B2:	100' x 230' = 23,000 square feet
Site B3:	100' x 120' = 12,000 square feet
Site B4:	100' x 210' = 21,000 square feet
Site B5:	100' x 200' = 20,000 square feet
Site B6:	100' x 150' = 15,000 square feet
Total:	**101,000 square feet**

Proposed dispersal method for the mass drainfield is drip irrigation with an installation depth of approximately 18 to 20 inches.

Fencing may be required around the proposed drainfield, proposed reserve drainfield and other onsite system components.

There are no known existing wells or drainfields that will impact the location of the proposed mass drainfield site.

This information is preliminary and may change with a detailed soil evaluation and site analysis.


BLOOMFIELD ROAD
UNISON ROAD
BEAVERDAM CREEK
QUAKER LANE
PIN 618-17-4821
PIN 618-30-6814
PIN 593-16-3665
PIN 640-49-6940
PIN 618-10-1628
PIN 619-48-6952
PIN 619-36-0718
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NOTES:
COMPOSITE MAP BASED ON AVAILABLE DATA FROM SOIL MAPS AND LOUDOUN COUNTY, VA GIS. AERIAL IMAGE FROM GOOGLE EARTH.
0' 300' 600' 900'
4' CONTOUR INTERVAL
N
EXHIBIT - LOUDOUN COUNTY GIS INFO
30,750 GPD CONCEPTUAL DF SITES
COMPOSITE MAP
FOR
UNISON WASTEWATER FEASIBILITY STUDY
LOUDOUN COUNTY, VA
EXHIBIT DATE: JANUARY 18, 2022
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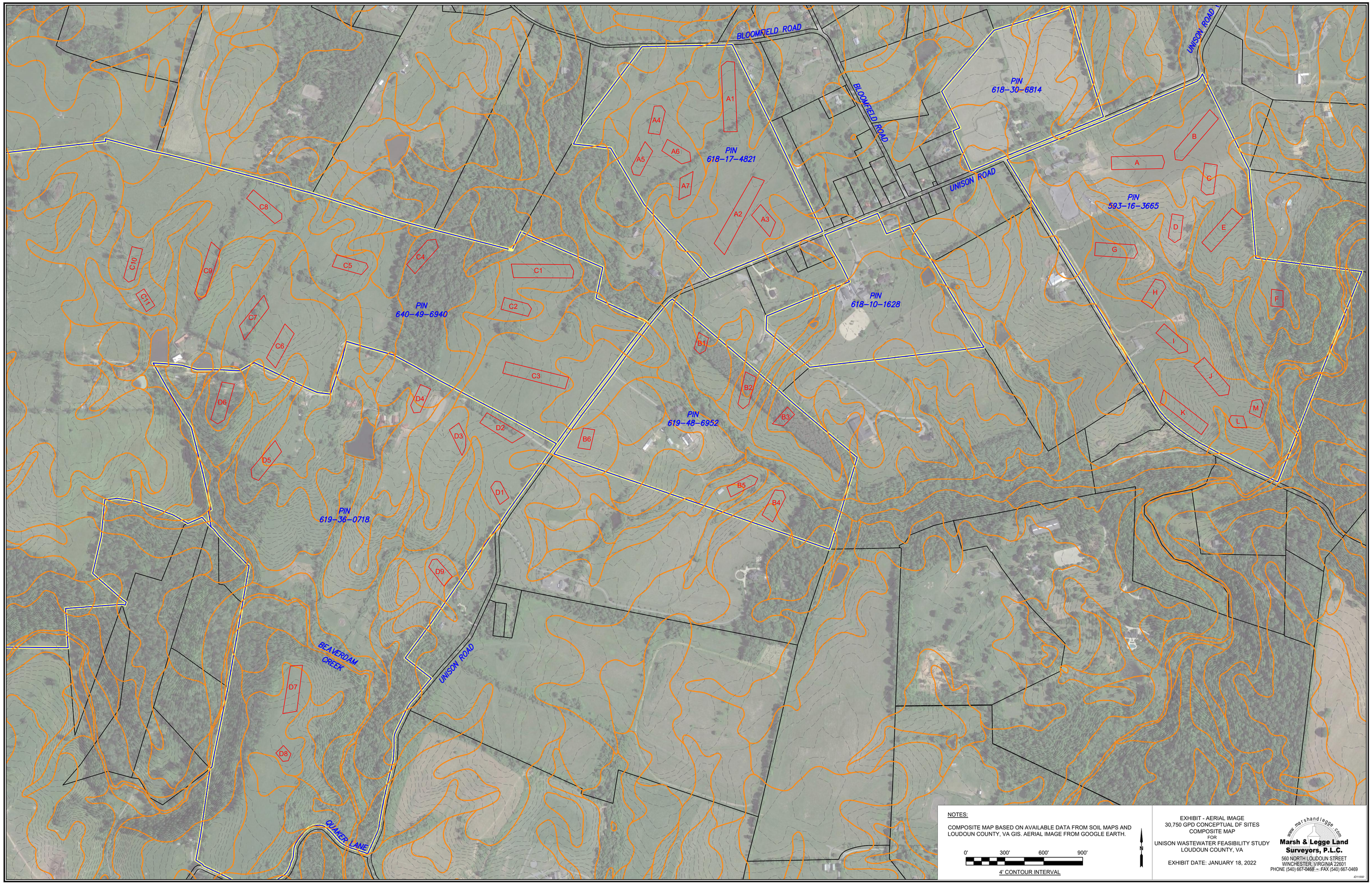

NOTES:

COMPOSITE MAP BASED ON AVAILABLE DATA FROM SOIL MAPS AND LOUDOUN COUNTY, VA GIS. AERIAL IMAGE FROM GOOGLE EARTH.

EXHIBIT - AERIAL IMAGE
30,750 GPD CONCEPTUAL DF SITES
COMPOSITE MAP
FOR
UNISON WASTEWATER FEASIBILITY STUDY
LOUDOUN COUNTY, VA

EXHIBIT DATE: JANUARY 18, 2022

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ID11550

Soil Texture	Percolation Rate (mpi)	Ksat (1) (cm/day)	Soil Type	Septic Tank Effluent (2)				TL-2 Effluent				TL-3 Effluent			
				Gravity Trench Loading (gpd/sqft)	LPD Trench Loading (gpd/sqft)	Gravity Gravelless Loading (gpd/sqft)	Drip Loading (3) (gpd/sqft)	Pressure Trench Loading (4,5) (gpd/sqft)	Gravity Trench Loading (6) (gpd/sqft)	Drip Loading (3) (gpd/sqft)	Pad Loading (7) (gpd/sqft)	Pressure Trench Loading (4,5) (gpd/sqft)	Gravity Trench Loading (6) (gpd/sqft)	Drip Loading (3) (gpd/sqft)	Pad Loading (8) (gpd/sqft)
Sand & Loamy Sand	5	>17	I	**0.91**	**0.91**	**1.20**	0.30	1.8	1.80	0.60	1.20	3.0	3.00	1.00	1.66
	10		I	**0.83**	**0.83**	**1.11**	0.28	1.67	1.67	0.56	1.11	2.67	2.67	0.89	1.66
	15		I	**0.76**	**0.76**	**1.01**	0.25	1.53	1.53	0.51	1.02	2.33	2.33	0.78	1.66
Sandy Loam	20	15 to 17	IIa	**0.68**	**0.68**	**0.91**	0.23	1.4	1.40	0.47	0.93	2.0	2.00	0.67	1.66
	25		IIa	**0.63**	**0.63**	**0.84**	0.21	1.30	1.30	0.43	0.86	1.75	1.75	0.58	1.33
Loam & Sandy Clay Loam	30	10 to <15	IIb	**0.57**	**0.61**	**0.76**	0.20	1.2	1.13	0.40	0.80	1.5	1.41	0.50	1.11
	35		IIb	**0.52**	**0.59**	**0.70**	0.20	1.10	0.98	0.37	0.73	1.38	1.22	0.46	0.95
	40		IIb	**0.48**	**0.57**	**0.64**	0.19	1.00	0.84	0.33	0.66	1.25	1.05	0.42	0.83
	45		IIb	**0.44**	**0.54**	**0.58**	0.18	0.90	0.73	0.30	0.60	1.13	0.91	0.38	0.74
Silt Loam, Clay Loam & Silty Clay Loam	50	4 to <10	III	**0.40**	**0.52**	**0.53**	0.17	0.8	0.62	0.27	0.53	1.0	0.77	0.33	0.67
	55		III	**0.36**	**0.49**	**0.49**	0.16	0.76	0.57	0.25	0.50	0.94	0.71	0.31	0.61
	60		III	**0.33**	**0.46**	**0.44**	0.15	0.71	0.51	0.24	0.47	0.89	0.64	0.30	0.55
	65		III	**0.30**	**0.44**	**0.40**	0.15	0.67	0.46	0.22	0.44	0.83	0.57	0.28	0.51
	70		III	**0.28**	**0.42**	**0.37**	0.14	0.62	0.41	0.21	0.41	0.78	0.51	0.26	0.48
	75		III	**0.25**	**0.40**	**0.33**	0.13	0.58	0.36	0.19	0.38	0.72	0.46	0.24	0.44
	80		III	**0.23**	**0.38**	**0.30**	0.13	0.53	0.32	0.18	0.35	0.67	0.40	0.22	0.42
	85		III	**0.21**	**0.37**	**0.28**	0.12	0.49	0.28	0.16	0.33	0.61	0.35	0.20	0.39
	90		III	**0.19**	**0.35**	**0.25**	0.12	0.44	0.24	0.15	0.30	0.56	0.30	0.19	0.37
Sandy Clay, Silty Clay & Clay	95	<4	IV	**0.17**	**0.35**	**0.20**	0.12	0.4	0.20	0.13	0.27	0.5	0.25	0.17	0.35
	100		IV	**0.16**	**0.32**	**0.19**	0.11	0.37	0.19	0.12	0.25	0.46	0.23	0.15	0.33
	105		IV	**0.14**	**0.29**	**0.17**	0.10	0.34	0.17	0.11	0.23	0.43	0.21	0.14	0.32
	110		IV	**0.13**	**0.26**	**0.16**	0.09	0.31	0.16	0.10	0.21	0.39	0.19	0.13	0.30
	115		IV	**0.12**	**0.24**	**0.14**	0.08	0.28	0.14	0.09	0.19	0.35	0.18	0.12	0.29
	120		IV	**0.11**	**0.22**	**0.13**	0.07	0.25	0.13	0.08	0.17	0.32	0.16	0.11	0.28

Bolded loading rates represent regulatory maximums.
Non-bolded loading rates represent interpolated/extrapolated recommendations.

Created: 2/7/2017

Footnotes:

(1) Per Peacock and Table 1 of the AOSS Regulations
(2) Regulatory maximum rates from Table 5.4 of the SH&DR
(3) Derived from Pressure rates per 12VAC5-610-955.C
(4) Regulatory maximum rates from Table 1 of the AOSS Regulations
(5) Intra-range rates interpolated/extrapolated from regulatroy rates
(6) Derived from Pressure rates using Gravity/LPD ratio from Table 5.4 of the SH&DR
(7) Derived from Pressure rates using ratio from Table 1 of GMP #147 (rescinded)
(8) From GMP #147 (rescinded)