FOR PUBLIC RELEASE

Source Water Protection Plan
Deerfield Village Subdivision

PWSID: WV3301979

Jefferson County

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Prepared By:

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In cooperation with Deerfield Village Subdivision

WV Bureau for Public Health, Source Water Assessment and Protection Program

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I Certify the information in the source water protection plan is complete and accurate to the best of my knowledge.

Responsible party of designee authorized to sign for water utility is on file:

Lee Snyder

Name of Authorizing Signatory:

Lee Snyder

Title of Authorizing Signatory:

7/9/2021

Date of Submission (mm/dd/yyyy):

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SOURCE WATER PROGRAM ACRONYMS

AST	Aboveground Storage Tank
BMP	Best Management Practices
ERP	Emergency Response Plan
GWUDI	Ground Water Under the Direct Influence of Surface Water
LEPC	Local Emergency Planning Committee
OEHS	EED Office of Environmental Health Services/Environmental Engineering Division
PE	Professional Engineer
PSSCs	Potential Source of Significant Contamination
PWSU	Public Water System Utility
RAIN	River Alert Information Network
RPDC	Regional Planning and Development Council
SDWA	Safe Drinking Water Act
SWAP	Source Water Assessment and Protection
SWAPP	Source Water Assessment and Protection Program
SWP	Source Water Protection
SWPA	Source Water Protection Area
SWPP	Source Water Protection Plan
WARN	Water/Wastewater Agency Response Network
WHPA	Wellhead Protection Area
WHPP	Wellhead Protection Program
WSDA	Watershed Delineation Area
WVBPH	West Virginia Bureau for Public Health
WVDEP	West Virginia Department of Environmental Protection
WVDHHR	West Virginia Department of Health and Human Resources
WVDHSEM	West Virginia Division of Homeland Security and Emergency Management
ZCC	Zone of Critical Concern
ZPC	Zone of Peripheral Concern

1.0 PURPOSE

The goal of the West Virginia Bureau of Public Health (WVBPH) source water assessment and protection (SWAP) program is to prevent degradation of source waters which may preclude present and future uses of drinking water supplies to provide safe water in sufficient quantity to users. The most efficient way to accomplish this goal is to encourage and oversee source water protection on a local level. Many aspects of source water protection may be best addressed by engaging local stakeholders.

The intent of this document is to describe what Deerfield Village Subdivision has done, is currently doing, and plans to do to protect its source of drinking water. Although this water system treats the water to meet federal and state drinking water standards, conventional treatment does not fully eradicate all potential contaminants and treatment that goes beyond conventional methods is often very expensive. By completing this plan, Deerfield Village Subdivision acknowledges that implementing measures to minimize and mitigate contamination can be a relatively economical way to help ensure the safety of the drinking water.

1.1. WHAT ARE THE BENEFITS OF PREPARING A SOURCE WATER PROTECTION PLAN?

- Fulfilling the requirement for the public water utilities to complete or update their source water protection plan.
- Identifying and prioritizing potential threats to the source of drinking water; and establishing strategies to minimize the threats.
- Planning for emergency response to incidents that compromise the water supply by contamination or depletion, including how the public, state, and local agencies will be informed.
- Planning for future expansion and development, including establishing secondary sources of water.
- Ensuring conditions to provide the safest and highest quality drinking water to customers at the lowest possible cost.
- Providing more opportunities for funding to improve infrastructure, purchase land in the protection area, and other improvements to the intake or source water protection areas.

2.0 BACKGROUND: WV SOURCE WATER ASSESSMENT AND PROTECTION PROGRAM

Since 1974, the federal Safe Drinking Water Act (SDWA) has set minimum standards on the construction, operation, and quality of water provided by public water systems. In 1986, Congress amended the SDWA. A portion of those amendments were designed to protect the source water contribution areas around ground water supply wells. This program eventually became known as the Wellhead Protection Program (WHPP). The purpose of the WHPP is to prevent pollution of the source water supplying the wells.

The Safe Drinking Water Act Amendments of 1996 expanded the concept of wellhead protection to include surface water sources under the umbrella term of Source Water Protection. The amendments encourage states to establish SWAP programs to protect all public drinking water supplies. As part of this initiative states must explain how protection areas for each public water system will be delineated, how potential contaminant sources will be inventoried, and how susceptibility ratings will be established.

In 1999, the WVBPH published the West Virginia Source Water Assessment and Protection Program, which was endorsed by the United States Environmental Protection Agency. Over the next few years, WVBPH staff completed an assessment (i.e., delineation, inventory and susceptibility analysis) for all of West Virginia's public water systems. Each public water system was sent a copy of its assessment report. Information regarding assessment reports for Deerfield Village Subdivision can be found in **Table 1**.

3.0 STATE REGULATORY REQUIREMENTS

On June 6, 2014, §16 1 2 and §16 1 9a of the Code of West Virginia, 1931,was reenacted and amended by adding three new sections, designated §16 1 9c, §16 1 9d and §16-1-9e. The changes to the code outlines specific requirements for public water utilities that draw water from a surface water source or a surface water influenced groundwater source.

Under the amended and new codes each existing public water utility using surface water or ground water influenced by surface water as a source must have completed or updated a source water protection plan by July 1, 2016, and must continue to update their plan every three years. Existing source water protection plans have been developed for many public water utilities in the past. If available, these plans were reviewed and considered in the development of this updated plan. Any new water system established after July 1, 2016 must submit a source water protection plan before they start to operate. A new plan is also required when there is a significant change in the potential sources of significant contamination (PSSC) within the zone of critical concern (ZCC).

The code also requires that public water utilities include details regarding PSSCs, protection measures, system capacities, contingency plans, and communication plans. Before a plan can be approved, the local health department and public will be invited to contribute information for consideration. In some instances, public water utilities may be asked to conduct independent studies of the source water protection area and specific threats to gain additional information.

4.0 SYSTEM INFORMATION

DEERFIELD VILLAGE SUBDIVISION is classified as a state regulated public utility and operates a community public water system. A community public water system is a system that regularly supplies drinking water from its own sources to at least 15 service connections used by year-round residents of the area or regularly serves 25 or more people throughout the entire year. For purposes of this source water protection plan, community public water systems are also referred to as public water utilities. Information on the population served by this utility is presented in **Table 1** below.

Table 1. Population Served by DEERFIELD VILLAGE SUBDIVISION

Administrative office location:	270 Industrial Blvd, Kearneysville, JEFFERSON, WV, 25430		
Is the system a public utility, according to the Public Service Commission rule?	Yes		
Date of Most Recent Source Water Assessment Report:	1/1/2008		
Date of Most Recent Source Water Protection Plan:	7/1/2019		
Population served directly:	132		
Bulk Water Purchaser Systems:	System Name	PWSID Number	Population
Total Population Served by the Utility:	132		
Does utility have multiple Source Water Protection Areas(SWPAs)?	Yes		
How many SWPAs does the utility have?	1		

5.0 WATER TREATMENT AND STORAGE

As required, Deerfield Village Subdivision has assessed their system (e.g., treatment capacity, storage capacity, unaccounted for water, contingency plans) to evaluate their ability to provide drinking water and protect public health. **Table 2** contains information on the water treatment methods and capacity of the utility.Information about the surface sources from which Deerfield Village Subdivision draws water can be found in **Table 3**. If the utility draws water from any groundwater sources to blend with the surface water the information about these ground water sources can be found in **Table 4**.

Table 2. Deerfield Village Subdivision Water Treatment Information

Default Facility	
Water treatment processes (in order of occurrence) includes:	Membrane Filtration, Disinfection (Sodium Hypochlorite), 32,000 gal Contact Tank (30 minute contact time), Pneumatic Tank
The treatment capacity is approximately (GPD):	57,600
Current average production is approximately (GPD):	11,900
Maximum gallons of water treated and produced at that plant in one day during the past year was:	49,000
Minimum gallons of water treated and produced at that plant in one day during the past year was:	0
Plant is operated an average of hours a day:	3
Maximum number of hours of operation in one day at that plant during the past year was:	8
Minimum number of hours of operation in one day at that plant during the past year was:	0
How many storage tank(s) are maintained on systems distrbution system:	1
Total gallons of treated water storage:	34,500
Total gallons of raw water storage (GALs):	2,600

Table 3. Deerfield Village Subdivision Surface Water Sources

Intake Name	Facility #	Local Name	Describe Intake	State Id Code	Date Constructed / Modified	Frequency of Use (Primary / Backup / Emergency)	Activity Status (Active/Inactive)

Table 4. Deerfield Village Subdivision Ground Water Sources

Well/Spring Name	Facility #	Local Name	Date Constructed / Modified	Completion Report Available (Yes/No)	Well Depth (ft)	Casting Depth (ft)	Grout (Yes/No)	Frequency of Use (Primary / Backup / Emergency)	Activity Status (Active/Inactive)
WELL #3	-		1/1/2004	Yes	280	80	Other	Permanent	Active
WELL #1	-		1/1/2004	Yes	240	60	Other	Permanent	Active
WELL #2	-		1/1/2004	Yes	500	63	Other	Permanent	Active

6.0 DELINEATIONS

For surface water systems, delineation is the process used to identify and map the drainage basin that supplies water to a surface water intake. This area is generally referred to as the source water protection area (SWPA). All surface waters are susceptible to contamination because they are exposed at the surface and lack a protective barrier from contamination. Accidental spills, releases, sudden precipitation events that result in overland runoff, or storm sewer discharges can allow pollutants to readily enter the source water and potentially contaminate the drinking water at the intake. The SWPA for surface water is distinguished as a Watershed Delineation Area (WSDA) for planning purposes; and the Zone of Peripheral Concern (ZPC) and Zone of Critical Concern (ZCC) are defined for regulatory purposes.

The WSDA includes the entire watershed area upstream of the intake to the boundary of the State of West Virginia border, or a topographic boundary. The ZCC for a public surface water supply is a corridor along streams within the watershed that warrant more detailed scrutiny due to its proximity to the surface water intake and the intake's susceptibility to potential contaminants within that corridor. The ZCC is determined using a mathematical model that accounts for stream flows, gradient and area topography. The length of the ZCC is based on a five-hour time-of-travel of water in the streams to the water intake, plus an additional one-quarter mile below the water intake. The width of the zone of critical concern is 1,000 feet measured horizontally from each bank of the principal stream, and five hundred feet measured horizontally from each bank of the tributaries draining into the principal stream. Ohio River ZCC delineations are based on ORSANCO guidance and extend 25 miles above the intake. The Ohio River ZCC delineations include 1,320 feet (1/4 mile) measured from the bank of the main stem of the Ohio River and 500 feet on a tributary.

The ZPC for a public surface water supply source and for a public surface water influenced groundwater supply source is a corridor along streams within a watershed that warrants scrutiny due to its proximity to the surface water intake and the intake's susceptibility to potential contaminants within that corridor. The ZPC is determined using a mathematical model that accounts for stream flows, gradient and area topography. The length of the zone of peripheral concern is based on an additional five-hour time-of-travel of water in the streams beyond the perimeter of the zone of critical concern, which creates a protection zone of ten hours above the water intake. The width of the zone of peripheral concern is one thousand feet measured horizontally from each bank of the principal stream and five hundred feet measured horizontally from each bank of the tributaries draining into the principal stream.

For groundwater supplies there are two types of SWPA delineations: 1) wellhead delineations and 2) conjunctive delineations, which are developed for supplies identified as groundwater under the direct influence of surface water, or GWUDIs. A wellhead protection area is determined to be the area contributing to the recharge of the groundwater source (well or spring), within a five year time of travel. A conjunctive delineation combines a wellhead protection area for the hydrogeologic recharge and a connected surface area contributing to the wellhead.

Information and maps of the WSDA, ZCC, ZPC and Wellhead Protection Area for this public water supply were provided to the utility and are attached to this report. See **Appendix A. Figures**. Other information about the WSDA is shown in **Table 5**.

Table 5. Watershed Delineation Information

Intake Name	
Method of Delineation for Groundwater Sources	Conjunctive Delineation
Area of Wellhead Protection Area (Acres)	395
Intake Name	
Method of Delineation for Groundwater Sources	Conjunctive Delineation
Area of Wellhead Protection Area (Acres)	395
Intake Name	
Method of Delineation for Groundwater Sources	Conjunctive Delineation
Area of Wellhead Protection Area (Acres)	395

7.0 PROTECTION TEAM

One important step in preparing a source water protection plan is to organize a source water protection team who will help develop and implement the plan. The legislative rule requires that water utilities make every effort to inform and engage the public, local government, local emergency planners, the local health department and affected residents at all levels of the development of the protection plan. WVBPH recommends that the water utility invite representatives from these organizations to join the protection team, which will ensure that they are given an opportunity to contribute in all aspects of source water protection plan development. Public water utilities should document their efforts to engage representatives and provide an explanation if any local stakeholder is unable to participate. In addition, other local stakeholders may be invited to participate on the team or contribute information to be considered. These individuals may be emergency response personnel, local decision makers, business and industry representatives, land owners (of land in the protection area), and additional concerned citizens.

The administrative contact for Deerfield Village Subdivision is responsible for assembling the protection team and ensuring that members are provided the opportunity to contribute to the development of the plan. The acting members of the Protection Team are listed in **Table 6**.

The role of the protection team members will be to contribute information to the development of the source water protection plan, review draft plans and make recommendations to ensure accuracy and completeness, and when possible contribute to implementation and maintenance of the protection plan. The protection team members are chosen as trusted representatives of the community served by the water utility and may be designated to access confidential data that contains details about the local PSSCs. The input of the protection team will be carefully considered by the water utility when making final decisions relative to the documentation and implementation of the source water protection plan.

Deerfield Village Subdivision will be responsible for updating the source water protection plan and rely upon input from the protection team and the public to better inform their decisions. To find out how you can become involved as a participant or contributor, visit the utility website or call the utility phone number, which are provided in **Table 6**.

Table 6. Protection Team Member and Contact Information

Name	Representing	Title	Phone Number	Email
Stephanie Reel	Deerfield Village Subdivision	General Manager	(304)728-2077	sreel@juiwater.net
Jeff Pippel	Deerfield Village Subdivision	Chief Operator	(304)728-2077	jpippel@juiwater.net
*Bill Zaleski	Deerfield Village Subdivision	Sanitation Supervisor: Environmental Section	(304)728-8415	bill.h.zaleski@wv.gov
	Deerfield Village Subdivision			
Bill Clark	Deerfield Village Subdivision	Director	(304)263-1743	bclark@region9wv.com
	Deerfield Village Subdivision			
Ralph Dinges	Jefferson County School District	Assistant Superintendent	(304)728-9265	
Jennifer Brockman	Jefferson County Department of Planning and Zoning	Director	(304)263-1743	jobrien@region9wv.com
Regina (Suzy) Campbell	West Virginia Conservation Agency	Conservation Specialist	(304)539-2682	rlucas@wvca.us
Tanner Haid	WV Rivers Coalition	Eastern Panhandle Field Coordinator	(304)886-2665	thaid@wvrivers.org
Date of First Protection Team Meeting:		Protection Team Meeting was held Monday, April 4, 2016 at Deerfield Village Subdivision. Meeting minutes attached in Appendix E.		
Efforts made to inform and engage local stakeholders (public, local government, local emergency planners, local health department, and affected residents) and explain absence of recommended stakeholders		A list of local stakeholders invited to join the Protection Team is provided in Appendix E-3. Potential members were invited via mail and email, wherever possible. PUBLIC MEETING JUNE 20, 2019 5:30 PM JUI OFFICES		

8.0 POTENTIAL SOURCES OF SIGNIFICANT CONTAMINATION

Source water protection plans should provide a complete and comprehensive list of the PSSCs contained within the ZCC, based upon information obtained from the WVBPH, working in cooperation with the West Virginia Department of Environmental Protection (WVDEP) and the West Virginia Division of Homeland Security and Emergency Management (WVDHSEM). A facility or activity is listed as a PSSC if it has the potential to release a contaminant that could potentially impact a nearby public water supply, and it does not necessarily indicate that any release has occurred.

The list of PSSCs located in the SWPA is organized into two types: 1) SWAP PSSCs, and 2) Regulated Data. SWAP PSSCs are those that have been collected and verified by the WVBPH SWAP program during previous field investigations to form source water assessment reports and source water protection plans. Regulated PSSCs are derived from federal and state regulated databases, and may include data from WVDEP, US Environmental Protection Agency, WVDHSEM, and from state data sources.

8.1. CONFIDENTIALITY OF PSSCS

A list of the PSSCs contained within the ZCC should be included in the source water protection plan. In the event of a chemical spill, release or other related emergency, information pertaining to the contaminant shall be immediately disseminated to any emergency responders reporting to the site. The designees for Deerfield Village Subdivision are identified in the communication planning section of the source water protection plan.

PSSC data from some agencies (ex. WVDHSEM, WVDEP, etc.) may be restricted due to the sensitive nature of the data. Locational data will be provided to the public water utility. However, to obtain specific details regarding contaminants, (such as information included in Tier II reports), water utilities should contact the local emergency planning commission (LEPC) or agencies, directly. While the maps and lists of the PSSCs and regulated sites are to be maintained in a confidential manner, these data are provided in **Appendix A. Figures** for internal review and planning uses only.

8.2. LOCAL AND REGIONAL PSSCS

For the purposes of this source water protection plan, local PSSCs are those that are identified by local stakeholders in addition to the PSSCs lists distributed by the WVBPH and other agencies. Local stakeholders may identify local PSSCs for two main reasons. The first is that it is possible that threats exist from unregulated sources and land uses that have not already been inventoried and do not appear in regulated databases. For this reason each public water utility should investigate their protection area for local PSSCs. A PSSC inventory should identify all contaminant sources and land uses in the delineated ZCC. The second reason local PSSCs are identified is because public water utilities may consider expanding the PSSC inventory effort outside of the ZCC into the ZPC and WSDA if necessary to properly identify all threats that could impact the drinking water source. As the utility considers threats in the watershed they may consider collaborating with upstream communities to identify and manage regional PSSCs.

When conducting local and regional PSSC inventories, utilities should consider that some sources may be obvious like above ground storage tanks, landfills, livestock confinement areas, highway or railroad right of ways, and sewage treatment facilities. Others are harder to locate like abandoned cesspools, underground tanks, French

drains, dry wells, or old dumps and mines.

The Deerfield Village Subdivision reviewed intake locations and the delineated SWPAs to verify the existence of PSSCs provided by the WVBPH and identify new PSSCs. If possible, locations of regulated sites within the SWPA were confirmed. Information on any new or updated PSSCs identified by Deerfield Village Subdivision and not already appearing in datasets from the WVBPH can be found in .**Table 7**.

Table 7. Locally Identified potential Sources of Significant Contamination

Please see Appendix A to view this information.

8.3. PRIORITIZATION OF THREATS AND MANAGEMENT STRATEGIES

Once the utility has identified local concerns, they must develop a management plan that identifies specific activities that will be pursued by the public water utility in cooperation and concert with the WVBPH, local health departments, local emergency responders, LEPC and other agencies and organizations to protect the source water from contamination threats.

Depending on the number identified, it may not be feasible to develop management strategies for all of the PSSCs in the SWPA. The identified PSSCs can be prioritized by potential threat to water quality, proximity to the intake(s), and local concern. The highest priority PSSCs can be addressed first in the initial management plan. Lower ranked PSSCs can be addressed in the future as time and resources allow. To assess the threat to the source water, water systems should consider confidential information about each PSSC. This information may be obtained from state or local emergency planning agencies, Tier II reports, facility owner, facility groundwater protection plans, spill prevention response plans, results of field investigations, etc.

In addition to identifying and prioritizing PSSCs within the SWPA, local source water concerns may also focus on critical areas. For the purposes of this source water protection plan, a critical area is defined as an area that is identified by local stakeholders and can lie within or outside of the ZCC. Critical areas may contain one or more PSSCs which would require immediate response to address a potential incident that could impact the source water.

A list of these priority PSSCs was selected and ranked by the Deerfield Village Subdivision Protection Team. This list reflects the concerns of this specific utility and may contain PSSCs not previously identified and not within the ZCC or ZPC. **Table 8** contains a description of why each critical area or PSSC is considered a threat and what management strategies the utility is either currently using or could use in the future to address each threat.

9.0 IMPLEMENTATION PLAN FOR MANAGEMENT STRATEGIES

Deerfield Village Subdivision reviewed the recommended strategies listed in their previous source water protection plan, to consider if any of them should be adopted and incorporated in this updated plan. **Table 9** provides a brief statement summarizing the status of the recommended strategies. **Table 9** also lists strategies from a previous plan that are being incorporated in this plan update.

When considering source management strategies and education and outreach strategies, this utility has considered how and when the strategies will be implemented. The initial step in implementation is to establish responsible parties and timelines to implement the strategies. The water utility, working in conjunction with the Protection Team members, can determine the best process for completing activities within the projected time periods. Additional meetings may be needed during the initial effort to complete activities, after which the Protection Team should consider meeting annually to review and update the Source Water Protection Plan. A system of regular updates should be included in every implementation plan.

Proposed commitments and schedules may change but should be well documented and reported to the local stakeholders. If possible, utilities should include cost estimates for strategies to better plan for implementation and possible funding opportunities. Deerfield Village Subdivision has developed an implementation plan for priority concerns listed in **Table 8**. The responsible team member, timeline, and potential cost of each strategy are presented in **Table 9**. Note: Because timelines may change, future plan updates should describe the status of each strategy and explain the lack of progress.

Table 8. Priority PSSCs or Critical Areas

PSSC or Critical Area	Priority Number	Reason for Concern
Agricultural Activities	1	Current and past land use in the area is predominantly agricultural. This can cause nutrient levels to become elevated in surrounding surface water bodies and/or the underlying groundwater system. There is also evidence that livestock are allowed access to one or more surface water bodies within the SWPA; this practice additionally elevates the nutrient and sediment loading of that surface water.
Residential Activities (including Stormwater) & Septic Systems	2	The residential areas within the SWPA operate on private wells and septic systems. The status of some older septic systems is unknown and failures and leaks are possible. Unlike other areas, in karst terrain a septic system often can fail downwards and can therefore be difficult to detect.
Commercial Activities	3	Facilities such as a trucking company lie within the SWPA and pose a threat due to the potential for accidental spills, leaks, improper disposal of hazardous wastes or improperly managed stormwater runoff. Additionally, some facilities may not be listed in State Regulated Databases, and therefore may not be inspected or regulated as they ought to be.
Nearby Surface Water Bodies	4	Surface waters within the SWPA include part of the headwaters of East Fork of Rockymarsh Run. This intermittent waterway is sourced within the SWPA by two springs and stormwater from a residential subdivision. Part of East Fork begins to the south of Deerfield Village within the SWPA and flows west through agricultural fields before being directed under Rt. 480 to the north. It then flows northwest, through additional agricultural areas and along the border of a residential development, before reaching a pond which is also within the SWPA. Along its path the Van Meter Farm Spring (north of Rt. 480) and an unnamed spring south of Rt. 480 additionally feed the East Fork. The single-family residential area to the east of Deerfield Village (Willow Spring Acres) discharges its stormwater to the aforementioned pond as well. It is not known if or to what extent water from Rockymarsh Run is lost to the groundwater aquifer within the SWPA.
Sinkholes	5	When sinkholes occur, a direct conduit from the surface to groundwater is created, and natural soil filtration processes are often bypassed. Water quality threats are dependent on surrounding land uses.

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Residential Activities (including Stormwater) & Septic Systems	Work with the Health Department, to the degree feasible, to encourage homeowners to maintain and routinely inspect their	Suzy Campbell, West Virginia Conservation Agency	Ongoing		Staff time providing informational materials.

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
	septic systems or replace old or failing septic systems with Best Available Technologies (BATs). Work with the Home Owner's Association or similar entity for the Willow Spring Acres single-family residential area to extend stormwater-specific source water protection centered educational materials to these residents.				
Sinkholes	Work with property owners to conduct a sinkhole survey of the SWPA, (particularly in areas south of Rt. 480) and distribute information on sinkhole mitigation options and BMPs to property owners. In the long term, support plans and progress made towards implementation of a sinkhole management program specific to SWPAs	JUI Deerfield Village Protection Team	Ongoing		JUI staff time working with property owners and the Department of Planning and Zoning.
Commercial Activities	Distribute site-specific Best Management Practice lists to facilities. JUI personnel may also inquire into the presence of on-site fuel storage at the trucking company facility.	Jeff Pippel, JUI	Not Started		JUI staff time providing informational materials.

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Agricultural Activities	Work with the County Extension Service, the Soil and Water Conservation District, and/or Natural Resources Conservation Service (NRCS) to encourage agricultural land owners to participate in nutrient management planning, forest conservation, land retirement and management programs (including riparian zone preservation or restoration) within the SWPA. Efforts here will focus on education and outreach measures.	Suzy Campbell, West Virginia Conservation Agency	Ongoing	Nutrient management plans are not required for agricultural facilities within Jefferson County but are provided at no cost by the USDA NRCS.	JUI staff time associated with raising local awareness of the existence of these programs.

10.0 EDUCATION AND OUTREACH STRATEGIES

The goal of education and outreach is to raise awareness of the need to protect drinking water supplies and build support for implementation strategies. Education and outreach activities will also ensure that affected citizens and other local stakeholders are kept informed and provided an opportunity to contribute to the development of the source water protection plan. Deerfield Village Subdivision has created an Education and Outreach plan that describes activities it has either already implemented or could implement in the future to keep the local community involved in protecting their source of drinking water. This information can be found in **Table 10**.

Table 10. Education and Outreach Implementation Plan

Education and Outreach Strategy	Description of Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
General Information Dissemination	Include educational information on the following topics on system website and the Deerfield Village Property Owner's Association website for public use: source water protection, water conservation, stormwater, household hazardous materials disposal, pharmaceuticals disposal, observing and reporting spills/leaks.	Deerfield Village Protection Team	Ongoing		Staff time pulling together information and making it available to public.
Display Information	Include informational materials (i.e. brochures, maps, etc.) in county government offices and other public places (i.e., local fairs). Host nonconfidential SWPP online for public review and comment.	Deerfield Village Protection Team	Ongoing		Staff time creating and displaying relevant information.
Early Education	Work with the Deerfield Village community to conduct educational source water protection specific activities or to include source water protection education into other community activities (i.e. tree planting).	Deerfield Village Protection Team	Ongoing		Staff time preparing for activities or providing information to community.
Sinkhole Management Planning	Support the efforts of entities such as WV BPH and the Jefferson County Department of Planning and Zoning in educating the County Commissioners on Source Water Protection Issues. Specifically, the issue of sinkholes and the need for a comprehensive sinkhole management plan. Such a program could possibly be added under existing stormwater regulations.	Deerfield Village Protection Team	Not Started		Staff time attending meetings and/or discussions to support the implementation of a sinkhole management plan.
BMP lists	Distribute lists of BMPs to the trucking company, and to owners of Agricultural Lands/Facilities within the SWPA.	Jeff Pippel, JUI	Not Started		Staff time creating BMP lists using published/provided materials.

Table 10. Education and Outreach Implementation Plan

Education and Outreach Strategy	Description of Activity	Responsible Protection Team Member	Status / Schedule	Comments	Estimated Cost
Public Workshops	Present Source Water Protection information at already scheduled meetings (i.e., Deerfield Village board meetings), during a related community event (i.e., community tree planting) and/or a Source Water specific Public Presentation.	Jeff Pippel, JUI	Not Started		Staff time preparing for and hosting workshops.
Clean Up Events	Coordinate with local Clean Up efforts and publicize projects. Work closely with other Watershed Associations.	Deerfield Village Protection Team	Ongoing		Staff time associated with watershed group coordination.
Waste Collection	Consider planning and publicizing more frequent community hazardous waste drop-off events.	Deerfield Village Protection Team	Ongoing		Staff time coordinating with waste collection entities and publicizing events.

11.0 CONTINGENCY PLAN

The goal of contingency planning is to identify and document how the utility will prepare for and respond to any drinking water shortages or emergencies that may occur due to short and long term water interruption, or incidents of spill or contamination. During contingency planning, utilities should examine their capacity to protect their intake, treatment, and distribution system from contamination. They should also review their ability to use alternative sources and minimize water loss, as well as their ability to operate during power outages. In addition, utilities should report the feasibility of establishing an early warning monitoring system and meeting future water demands.

Isolating or diverting any possible contaminant from the intake for a public water system is an important strategy in the event of an emergency. One commonly used method of diverting contaminants from an intake is establishing booms around the intake. This can be effective, but only for contaminants that float on the surface of the water. Alternatively, utilities can choose to pump floating contaminants from the water or chemically neutralize the contaminant before it enters the treatment facility.

Public utilities using surface sources should be able to close the intake by one means or another. However, depending upon the system, methods for doing so could vary greatly and include closing valves, lowering hatches or gates, raising the intake piping out of the water, or shutting down pumps. Systems should have plans in place in advance as to the best method to protect the intake and treatment facility. Utilities may benefit from turning off pumps and, if possible, closing the intake opening to prevent contaminants from entering the piping leading to the pumps. Utilities should also have a plan in place to sample raw water to identify the movement of a contaminant plume and allow for maximum pumping time before shutting down an intake (See Early Warning Monitoring System). The amount of time that an intake can remain closed depends on the water infrastructure and should be determined by the utility before an emergency occurs. The longer an intake can remain closed in such a case, the better.

Raw and treated water storage capacity also becomes extremely important in the event of such an emergency. Storage capacity can directly determine how effectively a water system can respond to a contamination event and how long an intake can remain closed. Information regarding the water shortage response capability of Deerfield Village Subdivision is provided in **Table 11**.

11.1. RESPONSE NETWORKS AND COMMUNICATION

PSSC data from some agencies (ex. WVDHSEM, WVDEP, etc.) may be restricted due to the sensitive nature of the data. Locational data will be provided to the public water utility. However, to obtain specific details regarding contaminants, (such as information included in Tier II reports), water utilities should contact the local emergency planning commission (LEPC) or agencies, directly. While the maps and lists of the PSSCs and regulated sites are to be maintained in a confidential manner, these data are provided in **Appendix A. Figures** for internal review and planning uses only.

Table 11. Deerfield Village Subdivision Water Shortage Response Capacity

Can the water utility isolate or divert contamination from the intake and groundwater supply?	No
Describe the results of an examination and analysis of the public water system's ability to isolate or divert contaminated waters from its surface water intake or groundwater supply:	The utility makes use of three groundwater supply wells. In the event of contamination of the water bearing fractures, pumps can be shut off, but contaminants cannot be isolated or diverted without bringing in and installing remediation equipment.
Describe the results of an examination and analysis of the public water system's existing ability to switch to an alternative water source or intake in the event of contamination of its primary water source:	The system has three permanent groundwater supply wells. In the event that one or two of the wells need to be brought offline the system may rely on the other(s) for some time by increasing the pumping time of the available well(s). Due to the direction of groundwater flow in the area and the geospatial arrangement of the three well sources there is not a reasonable threat of more than one well becoming affected by the same contamination event.
Is the Utility able to close the water intake in the event of a spill?	Yes
How long can the Utility keep the intake closed?	On average, system can operate with all wells offline for 1.73 days.
Describe the process to close the intake:	CONFIDENTIAL
Describe the treated water system's storage capacity of the water system:	32,000-gal concrete water vault 2,500 gal pneumatic tank
Gallons of storage capacity (raw water)	0
Gallons of storage capacity (treated water)	0
Is the Utility a member of WVRWA Emergency Response Team?:	Yes
Is the Utility a member of WV-WARN?:	Yes
List other agreements to provide receive assistance in case of emergency:	Generator with Snyder Environmental Verbal agreements with neighboring municipalities

11.2. OPERATION DURING LOSS OF POWER

Deerfield Village Subdivision analyzed its ability to operate effectively during a loss of power. This involved ensuring a means to supply water through treatment, storage, and distribution without creating a public health emergency. Information regarding the utility's capacity for operation during power outages is summarized in **Table 12**.

Table 12. Generator Capacity

Can you connect to a generator at the intake/wellhead?:	No
Please provide a scenario that best describes your system:	

What do you have (KW)?			
What do you need (KW)?			
Can you connect to a generator at the treatment facility?:		Yes	
Please provide a scenario that best describes your system:		Snyder environmental has a portable generator available to connect to the treatment plant. Electrical connection and transfer switch was completed in this period.	
What do you have (KW)?			
What do you need (KW)?			
Can you connect to a generator at the distribution system?:		No	
Please provide a scenario that best describes your system:			
What do you have (KW)?			
What do you need (KW)?			
Does the utility have fuel on hand for generator?:		Yes	
Hours:		168	
Gallons:		3,500	
Provide a list of suppliers and alternate suppliers that could provide fuel in the event of an emergency:		Supplier	Phone Number
	Fuel	Sunoco	(304)725-1900
	Generator	Bonnie Serrett WVWARN	(304)335-2035
Does the utility test the generator(s) periodically?:		No	
Does the utility routinely maintain the generator(s)?:		No	
If the Utility does not have generator or the ability to connect to a generator, describe plans to respond to power outages:		A Portable, Diesel, 12KVA, 3 Phase, 460 Volts is needed to operate the plant during a loss of power.	

11.3. FUTURE WATER SUPPLY NEEDS

When planning for potential emergencies and developing contingency plans, a utility needs to not only consider their current demands for treated water but also account for likely future needs. This could mean expanding current intake sources or developing new ones in the near future. This can be an expensive and time consuming process, and any water utility should take this into account when determining emergency preparedness. Deerfield Village Subdivision has analyzed its ability to meet future water demands at current capacity, and this information is included in **Table 13** .

Table 13. Future Water Supply Needs for Deerfield Village Subdivision

Is the Utility able to meet water demands with the current capacity for the next five years?	Yes
Explain how you plan to do so:	Yes, the utility services a specific residential subdivision (Deerfield Village) with known demand based on full buildout. Current production capacity has been sized appropriately to meet the demand at full buildout.

11.4. WATER LOSS CALCULATION

In any public water system, there is a certain percentage of the total treated water that does not reach the customer.Some of this water is used in treatment plant processes such as back washing filters or flushing piping, but there is usually at least a small percentage that goes unaccounted for. To measure and report on this unaccounted-for water, a public utility must use the method described in the Public Service Commission's rule, Rules for the Government of Water Utilities, 150CSR7, section 5.6. The rule defines unaccounted for water as the volume of water introduced into the distribution system less all metered usage and all known non-metered usage which can be estimated with reasonable accuracy.

To further clarify, metered usages are most often those that are distributed to customers. Non-metered usages that are being estimated include usage by fire departments for fires or training, un-metered bulk sells, flushing to maintain the distribution system, and water used for backwashing filters and cleaning settling basins. By totaling the known metered and non-metered uses the utility calculates unaccounted for water. Note: To complete annual reports submitted to the PSC, utilities typically account for known water main breaks by estimating the amount of water lost. However, for the purposes of the source water protection plan, any water lost due to leaks, even if the system is aware of how much water is lost at a main break, is not considered a use. Water lost through leaks and main breaks cannot be controlled during a water shortages or other emergencies and should be included in the calculation of percentage of water loss for purposes of the source water protection plan. The data in **Table 13** is taken from the most recently submitted Deerfield Village Subdivision PSC Annual Report.

Table 14. Water Loss Information

Water pumped - Total Gallons:		242,314,000
*Water purchased - Total Gallons:		0
Total gallons of water pumped and purchased:		242,314,000
Total gallons of water loss accounted for except main leaks:	Mains, plaint, filters, flushing, etc - Total Gallons:	27,940,000
	Fire department - Total Gallons:	2,400,000
	Back washing - Total Gallons:	6,948,000
	Blowing settling basins - Total Gallons:	0
Total Accounted for Water Loss		37,288,000
Unaccounted for lost water - Total Gallons:		35,278,000
Water sold - Gallons:		161,276,000
Water Lost from Main Leaks:		8,472,000
Total Gallons of Unaccounted for Lost Water and Water Lost from Main Leaks:		43,750,000
Total percent unaccounted for water		18
Describe the measures to correct water loss greater than 15%:	The water loss information, provided above, is for the combination of all systems operated by JUI. Based on input provided by Mr. Jeffery Pippel (JUI), the total percentage of unaccounted for water for the Deerfield Village system is estimated to be less than 10%.	

11.5. EARLY WARNING MONITORING SYSTEM

Public water utilities are required to provide an examination of the technical and economic feasibility of implementing an early warning monitoring system. Implementing an early warning monitoring system may be approached in different ways depending upon the water utility's resources and threats to the source water. A utility may install a continuous monitoring system that will provide real time information regarding water quality conditions. This would require utilities to analyze the data to establish what condition is indicative of a contamination event. Continuous monitoring will provide results for a predetermined set of parameters. The more parameters that are being monitored, the more sophisticated the monitoring equipment will need to be. When establishing a continuous monitoring system, the utility should consider the logistics of placing and maintaining the equipment, and receiving output data from the equipment.

Alternately, or in addition, a utility may also pull periodic grab samples on a regular basis, or in case of a reported incident. The grab samples may be analyzed for specific contaminants. A utility should examine their PSSCs to determine what chemical contaminants could pose a threat to the water source. If possible, the utility should plan in advance how those contaminants will be detected. Consideration should be given to where samples will be collected, the preservations and hold times for samples, available laboratories to analyze samples, and costs associated with the sampling event. Regardless of the type of monitoring (continuous or grab), utilities should collect samples for their source throughout the year to better understand the baseline water quality conditions and natural seasonal fluctuations. Establishing a baseline will help determine if changes in the water quality are indicative of a contamination event and inform the needed response.

Every utility should establish a system or process for receiving or detecting chemical threats with sufficient time to respond to protect the treatment facility and public health. All approaches to receiving and responding to an early warning should incorporate communication with facility owners and operators that pose a threat to the water quality, with state and local emergency response agencies, with surrounding water utilities, and with the public. Communication plays an important role in knowing how to interpret data and how to respond.

Deerfield Village Subdivision has analyzed its ability to monitor for and detect potential contaminants that could impact its source water. Information regarding this utility's early warning monitoring system capabilities is provided in **Table 15** and in **Appendix B**.

Table 15. Early Warning Monitoring System Capabilities

Does your system currently receive spill notifications from a state agency, neighboring water system, local emergency responders, or other facilities?	Yes
From whom do you receive notices?	Yes, notifications are received from the West Virginia Department of Environmental Protection and Local Fire and Police Stations. The Department of Health and Human Resources Bureau for Public Health also sends out emails regarding spills reported throughout the County.
Are you aware of any facilities, land uses, or critical areas within your protection areas where chemical contaminants could be released or spilled?	Yes
Are you prepared to detect potential contaminants if notified of a spill?	Yes

List laboratories (and contact information) on whom you would rely to analyze water samples in case of a reported spill.	Laboratories		
	Name	Phone Number	
	CONFIDENTIAL		
Do you have an understanding of baseline or normal conditions for your source water uality that accounts for seasonal fluctuations?		Yes	
Does your utility (aside from turbidity monitoring) currently monitor your raw water through continuous monitoring at the surface water intake or groundwater source to detect changes in water quality that could indicate contamination?		Yes	
Does your utility collect periodic grab samples (ex. possess reserved sample bottles, on-call laboratory services, and trained personnel) in response to a spill notification or to investigate changes in water quality that could indicate contamination?		Yes	
Please explain:		Yes, pH and turbidity. The system is also contemplating acquiring equipment to monitor conductivity, dissolved oxygen, temperature, total dissolved solids, alkalinity and hardness.	
Provide or estimate the capital and O&M costs for your current or proposed early warning system or upgraded system.	Capital Cost:	0	
	O&M Cost:	0	
Do you serve more than 100,000 customers?		No	
Does your system currently receive spill notifications from a state agency, neighboring water system, local emergency responders, or other facilities?		Yes	
Are you prepared to detect potential contaminants if notified of a spill?		Yes	
Please describe the methods you use to monitor at the same technical levels utilized by ORSANCO:			

12.0 SINGLE SOURCE FEASIBILITY STUDY

If a public water utility's water supply plant is served by a single–source intake to a surface water source of supply or a surface water influenced source of supply, the submitted source water protection plan must also include an examination and analysis of the technical and economic feasibility of alternative sources of water to provide continued safe and reliable public water service in the event that its primary source of supply is detrimentally affected by contamination, release, spill event or other reason. These alternatives may include a secondary intake, two days of additional raw or treated water storage, an interconnection with neighboring systems, or other options identified on a local level. Note: a suitable secondary intake would draw water supplies from a substantially different location or water source.

To accomplish this requirement, utilities should examine all existing or possible alternatives and rank them by their technical, economic, and environmental feasibility. To have a consistent and complete method for ranking alternatives, WVBPH has developed a feasibility study guide. This guide provides several criteria to consider for each category, organized in a Feasibility Study Matrix. By completing the Feasibility Study Matrix, utilities will demonstrate the process used to examine the feasibility of each alternative and document scores that compare the alternatives. The Feasibility Study matrix and summary of the results are presented in an alternatives feasibility study attached as **Appendix D**.

13.0 COMMUNICATION PLAN

Deerfield Village Subdivision has also developed a Communication Plan that documents the manner in which the public water utility, working in concert with state and local emergency response agencies, shall notify the local health agencies and the public of the initial spill or contamination event and provide updated information related to any contamination or impairment of the system's drinking water supply. The initial notification to the public will occur in any event no later than thirty minutes after the public water system becomes aware of the spill, release, or potential contamination of the public water system. A copy of the source water protection plan and the Communication Plan has been provided to the local fire department. Deerfield Village Subdivision will update the Communication Plan as needed to ensure contact information is up to date.

Procedures should be in place to effectively react to the kinds of catastrophic spills that can reasonably be predicted at the source location or within the SWPA. The chain-of-command, notification procedures and response actions should be known by all water system employees.

The WVBPH has developed a recommended communication plan template that provides a tiered incident communication process to provide a universal system of alert levels to utilities and water system managers. The comprehensive Communication Plan for Deerfield Village Subdivision is attached as **Appendix C** for internal review and planning purposes only.

The West Virginia Department of Environmental Protection is capable of providing expertise and assistance related to prevention, containment, and clean-up of chemical spills. The West Virginia Department of Environmental Protection Emergency Response 24-hour Phone is 1-800-642-3074. The West Virginia Department of Environmental Protection also operates an upstream distance estimator that can be used to determine the distance from a spill site to the closest public water supply surface water intake.

14.0 EMERGENCY RESPONSE

A public water utility must be prepared for any number of emergency scenarios and events that would require immediate response. It is imperative that information about key contacts, emergency services, and downstream water systems be posted and readily available in the event of an emergency. Elements of this source water protection plan, such as the contingency planning and communication plan, may contain similar information to the utility's emergency response plan. However, the emergency response plan is to be kept confidential and is not included in this source water protection plan. An Emergency Short Form is included in **Appendix C** to support the Communicate Plan by providing quick access to important information about emergency response and are to be used for internal review and planning purposes only.

15.0 CONCLUSION

This report represents a detailed explanation of the required elements of Deerfield Village Subdivision's Source Water Protection Plan. Any supporting documentation or other materials that the utility considers relevant to their plan can be found in **Appendix E**.

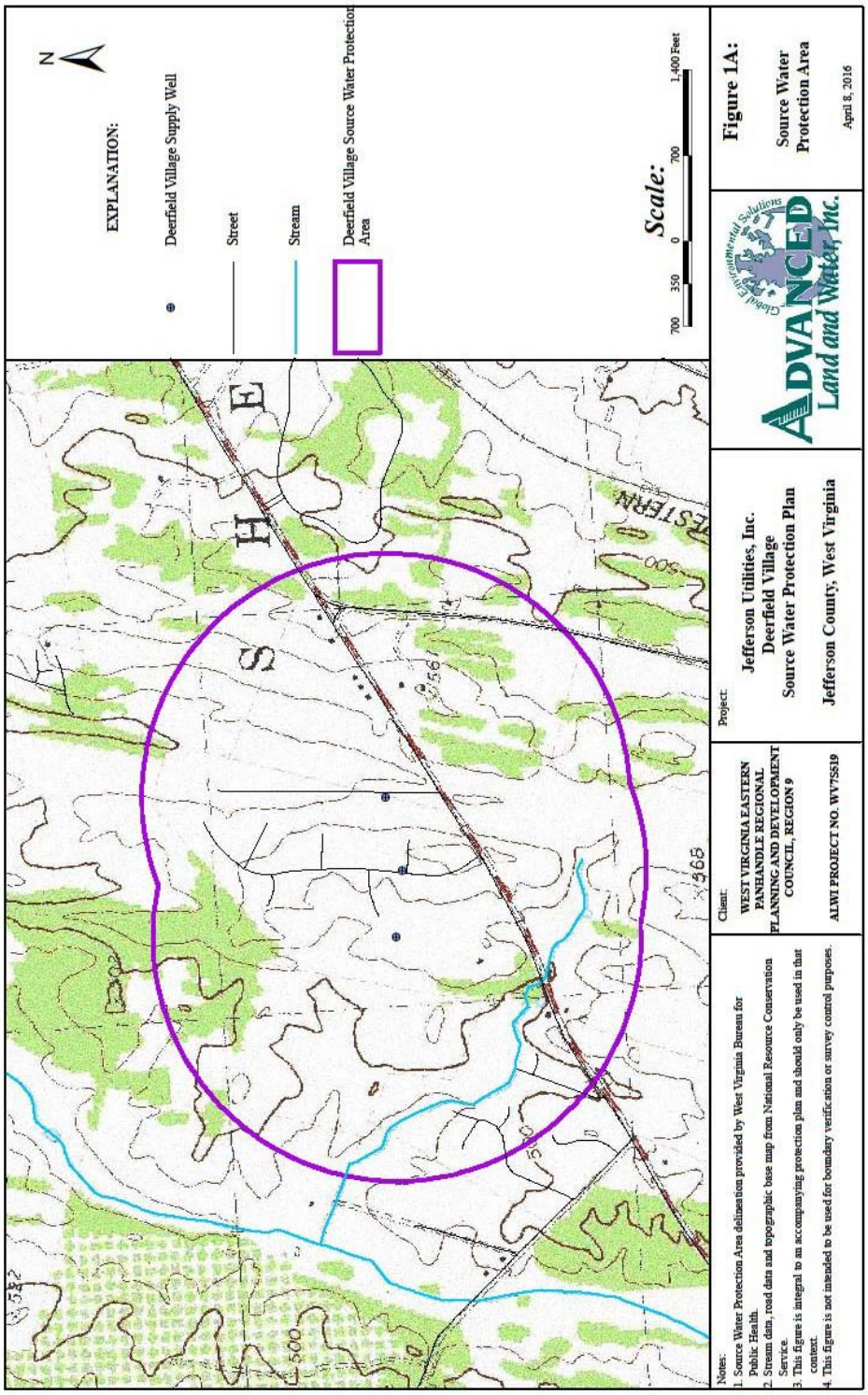
This source water protection plan is intended to help prepare community public water systems all over West Virginia to properly handle any emergencies that might compromise the quality of the system's source water supply. It is imperative that this plan is updated as often as necessary to reflect the changing circumstances within the water system. The protection team should continue to meet regularly and continue to engage the public whenever possible. Communities taking local responsibility for the quality of their source water is the most effective way to prevent contamination and protect a water system against contaminated drinking water. Community cooperation, sufficient preparation, and accurate monitoring are all critical components of this source water protection plan, and a multi-faceted approach is the only way to ensure that a system is as protected as possible against source water degradation.

APPENDIX A. FIGURES AND TABLES

Water Source / Delineation

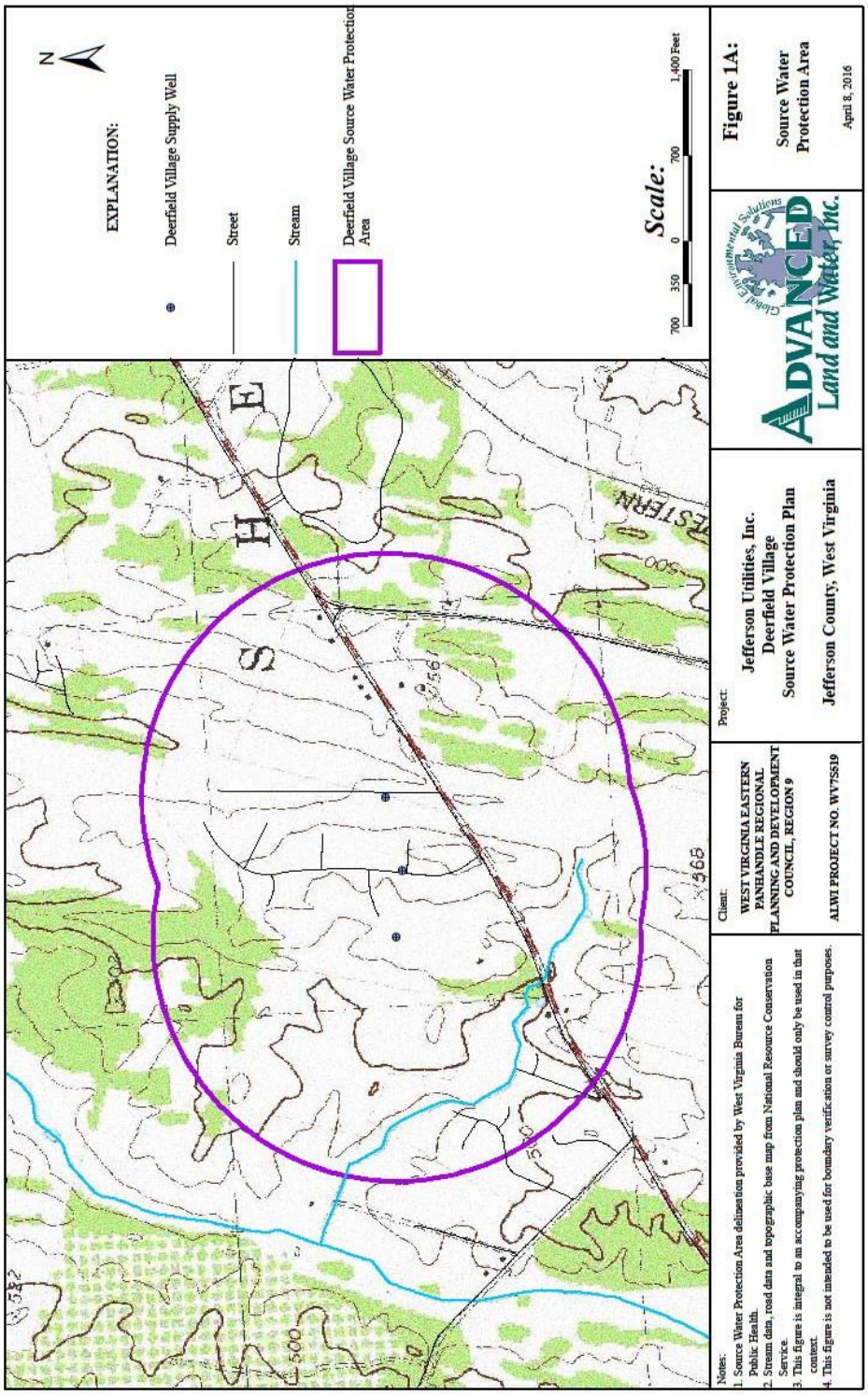
Ground Water Sources

Intake: WL003



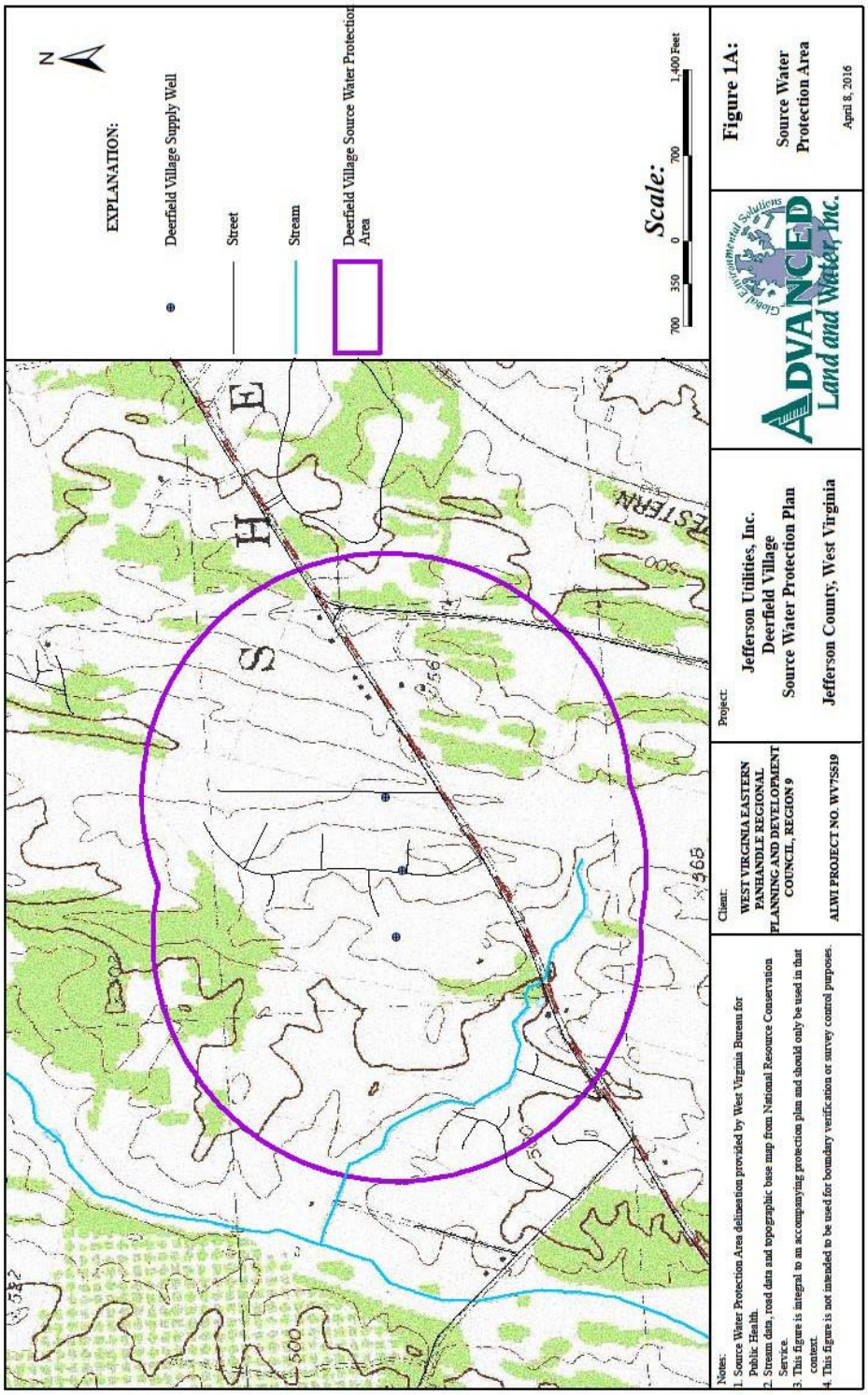
30

Intake: WL001



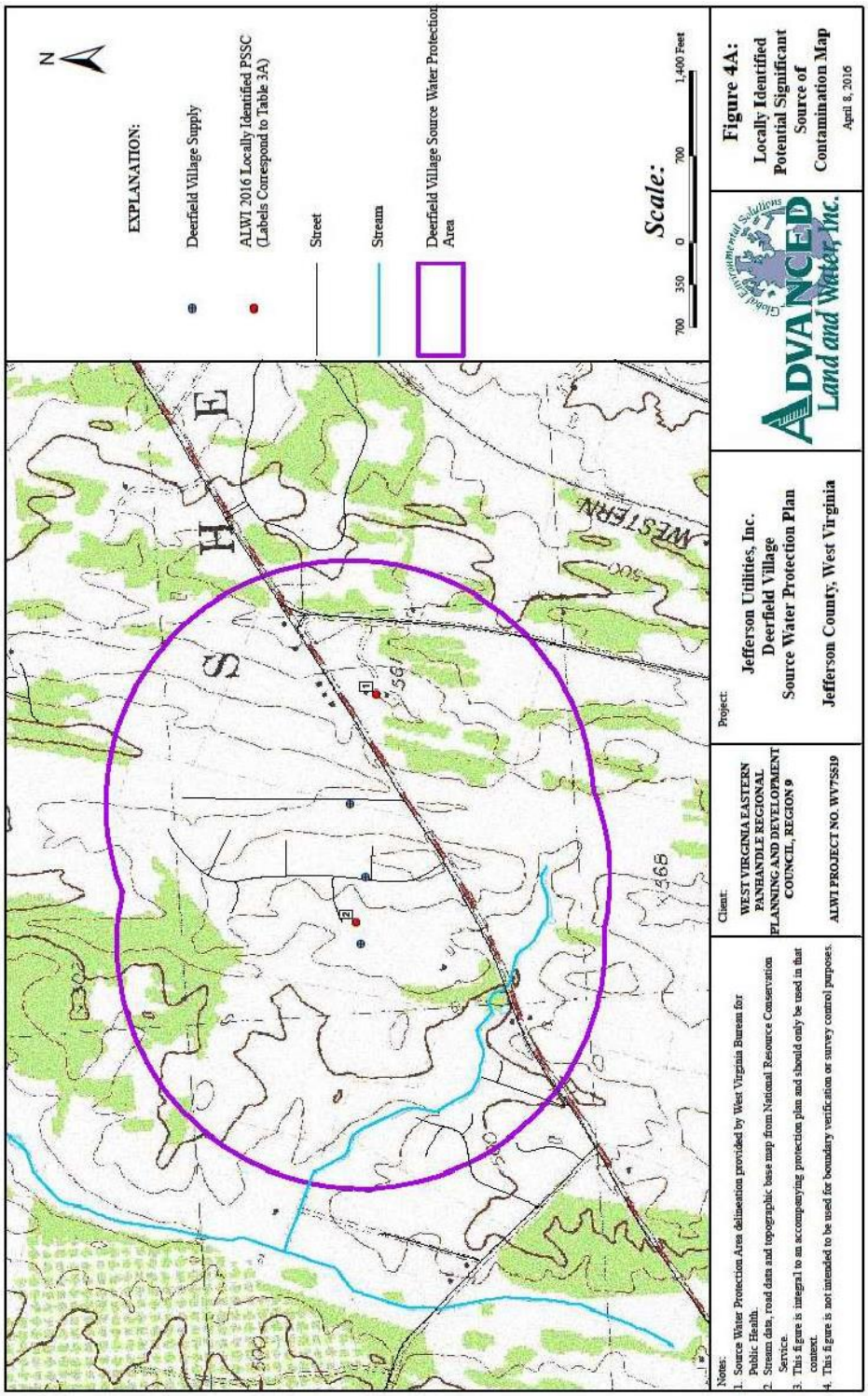
30

Intake: WL002

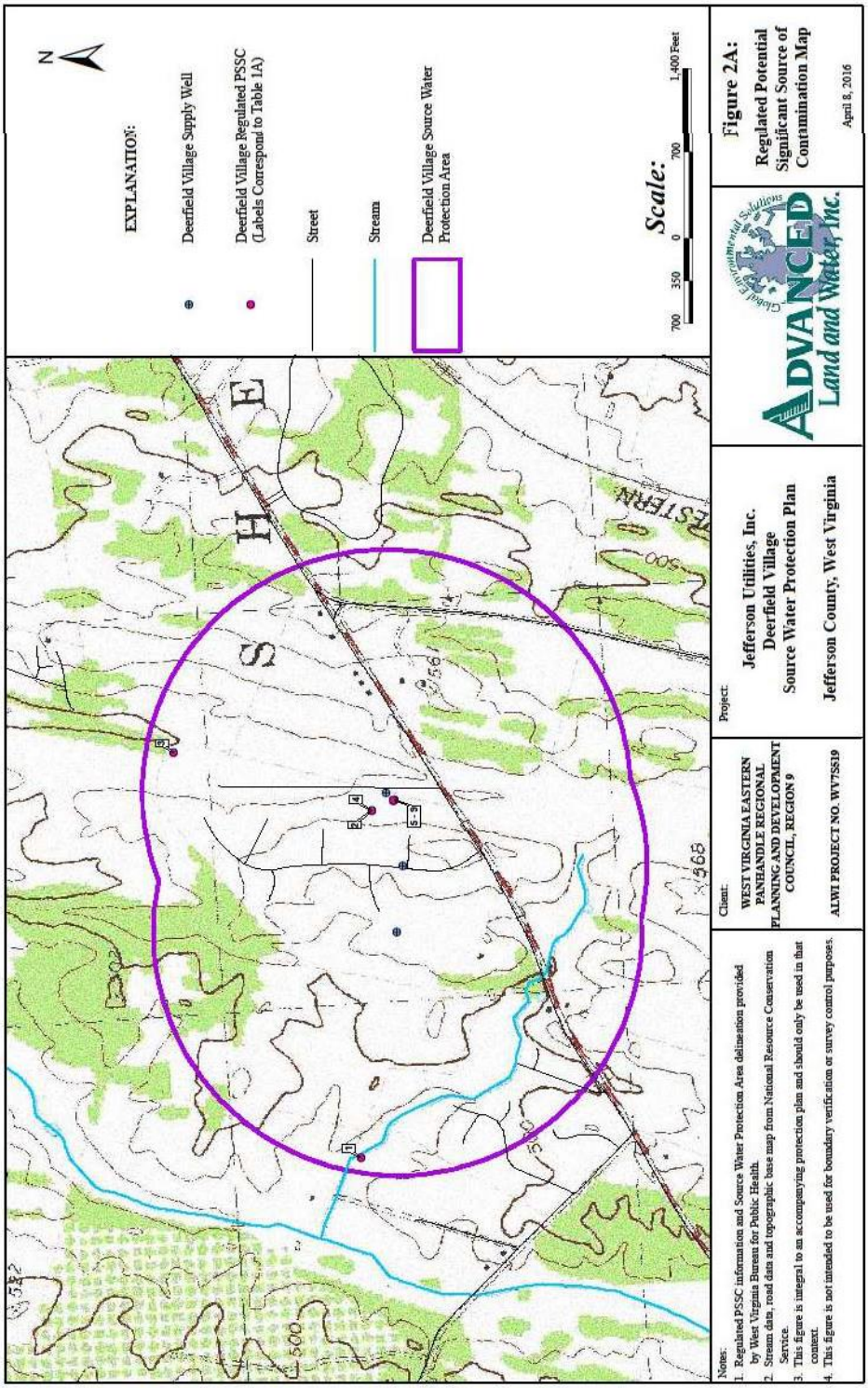

N
EXPLANATION:
Deerfield Village Supply Well
Street
Stream
Deerfield Village Source Water Protection Area
Scale:
700 350 0 700 1,400 Feet
Figure 1A:
Source Water Protection Area
April 8, 2016
ADVANCED Land and Water, Inc.
Global Environmental Solutions
Project:
Jefferson Utilities, Inc.
Deerfield Village
Source Water Protection Plan
Jefferson County, West Virginia
Client:
WEST VIRGINIA EASTERN PANHANDLE REGIONAL PLANNING AND DEVELOPMENT COUNCIL, REGION 9
ALWI PROJECT NO. WV7SS19
Notes:
1. Source Water Protection Area delineation provided by West Virginia Bureau for Public Health.
2. Stream data, road data and topographic base map from National Resource Conservation Service.
3. This figure is integral to an accompanying protection plan and should only be used in that context.
4. This figure is not intended to be used for boundary verification or survey control purposes.

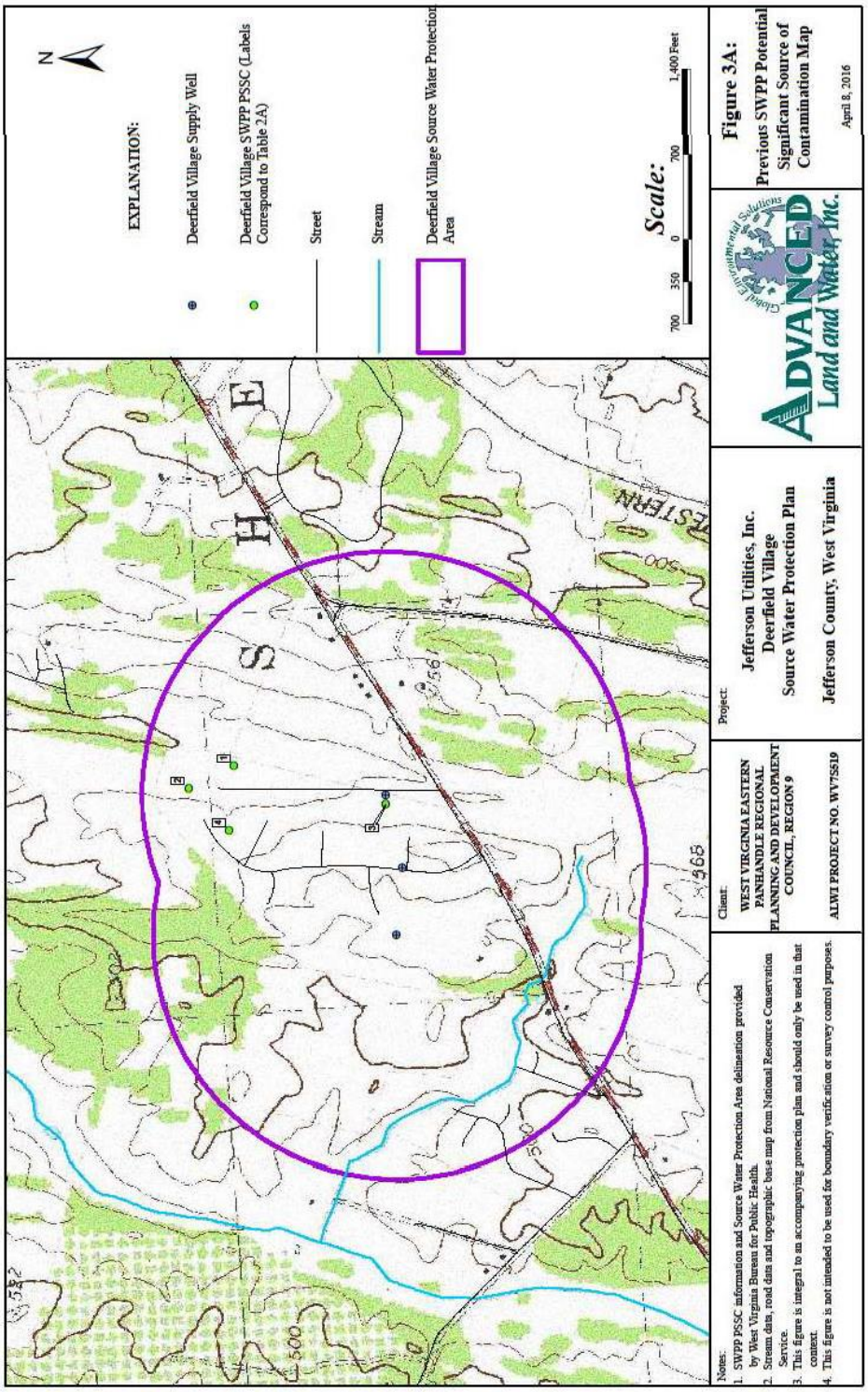
PSSC Maps

Local and Regional PSSC Map



Regulated PSSC Map




N
EXPLANATION:
Deerfield Village Supply Well
Deerfield Village SWPP PSSC (Labels Correspond to Table 2A)
Street
Stream
Deerfield Village Source Water Protection Area
Scale:
0
350
700
700
1,400 Feet
Figure 3A:
Previous SWPP Potential Significant Source of Contamination Map
April 8, 2016
ADVANCED Land and Water, Inc.
Global Environmental Solutions
Project:
Jefferson Utilities, Inc.
Deerfield Village
Source Water Protection Plan
Jefferson County, West Virginia
Client:
WEST VIRGINIA EASTERN PANHANDLE REGIONAL PLANNING AND DEVELOPMENT COUNCIL, REGION 9
ALWI PROJECT NO. WV75519
Notes:
1. SWPP PSSC information and Source Water Protection Area delineation provided by West Virginia Bureau for Public Health.
2. Stream data, road data and topographic base map from National Resource Conservation Service.
3. This figure is integral to an accompanying protection plan and should only be used in that context.
4. This figure is not intended to be used for boundary verification or survey control purposes.

PSSC Lists

Local and Regional PSSC List

Table 3A: List of Locally Identified PSSCs

Map Label	Source Name	Source Description	Type	Map Code	Associated Chemicals	Threat to GW	Threat to SW
1	Dependable Trucking, Inc.	Truck Terminal	Commercial	C-14	M, VOC, HM, SOC, PH	H	H
2	Geothermal Well Unit	Water flows through a network of pipes buried 6-8' underground to heat and cool the residence.	Residential	R-7			

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Regulated PSSC List

Table 1A: List of Regulated PSSCs

Map Label	Source Name	Source Description
1	ICIS (Integrated Compliance Information System) NPDES Site	Stormwater Pond (Recieves flow from Willow Springs Acres Residential Subdivision)
2	Deerfield Village (Jefferson Co. PSD)	5W12 - Domestic Wastewater Trtmnt Plant Effl Disp
3	Deerfield Village (Jefferson Co. PSD)	5W12 - Domestic Wastewater Trtmnt Plant Effl Disp
4	Deerfield Village (Jefferson Co. PSD)	5W12 - Domestic Wastewater Trtmnt Plant Effl Disp
5	Deerfield Village Tank #22-1	Storage Tank
6	Deerfield Village Tank #22-2	Storage Tank
7	Deerfield Village Tank #22-1	Storage Tank
8	Deerfield Village Tank #22-1	Storage Tank
9	Deerfield Village Tank #22-2	Storage Tank

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Table 2A: List of Previous SWPP PSSCs

Map Label	Source Name	Source Description	Type	Map Code	Associated Chemicals	Threat to GW	Threat to SW
1	Private Residence	Septic Systems (leach field)	Residential	R-6	MP, VOC, SOC, TO, NN	M	M
2	Private Residence	Septic Systems (leach field)	Residential	R-6	MP, VOC, SOC, TO, NN	M	M
3	Water Treatment Plant	Drinking Water Treatment Plants	Municipal	M-5	D	L	L
4	Private Residence	Crops: orchards	Agriculture	A-6	NN, SOC	L	L

APPENDIX B. EARLY WARNING MONITORING SYSTEM FORMS

Select and Attach the Appropriate Form for Your System

Form A - Complete if you currently have an early warning monitoring system for a groundwater source.

Form B - Complete if you currently have an early warning monitoring system installed for a surface water source.

Form C - If you do not currently have an early warning monitoring system installed for a surface water intake or are planning to upgrade or replace your current system, complete this form.

Form D - If you do not currently have an early warning monitoring system installed for a groundwater source or are planning to upgrade or replace your current system, complete this form.

Note: You may need to fill out and attach more than one form to your Protection Plan, depending on your current situation.

Appendix B - Form C
Ground Monitoring Worksheet

Describe the type of early warning detection equipment installed:
The utility currently employs continuous monitoring of turbidity using a
How many monitoring (sentinel) wells are established?
None. Due to the complex hydrogeologic setting and widespread geospatial position of PSSCs, there is no guarantee that installation of monitoring wells would provide adequate advanced notification of contamination in the groundwater system. Monitoring wells may be considered in the future if outside funding sources are available.
What is the expected rate of travel of a contaminant through the groundwater system?
Travel times are highly dependent on the 1.) Location of the contaminant source with respect to System sources, 2.) Hydraulic conductivity of geologic formations, which reflects the degree to which fractures are naturally enlarged and 3.) Hydraulic gradient along groundwater flow pathways. As such, travel times vary significantly throughout the SWPA and change as hydrologic conditions change.
Provide the distance from the contaminant source to the monitoring wells:
n/a
What is the distance of the monitoring equipment to the well head?
The raw water monitoring equipment and raw water tap (for grab samples) is in the head works of the treatment plant. No monitoring wells currently exist to monitor raw water before it reaches the wellhead.
Describe the mechanism to store the data and an institutional framework to analyze and interpret the data:
Water chemistry for pH and turbidity is recorded on daily charts for the operators to reference. The data is then archived for future reference.
Describe the process to determine the credibility of a contamination event if a change is detected in the quality of source water:
If a notable change is detected in water quality for a parameter regularly monitored, an additional water quality sample will be taken immediately for result verification. If the result is confirmed, more comprehensive testing would be performed, depending on the type of water quality change observed, for the purpose of differentiating between hazard types. Utility personnel may also choose to shut down the well pumps until an appropriate course of action is determined. This would not affect the quality or quantity of water delivered to customers, as the utility has adequate storage for several days. If the sample is in violation of an MCL, an additional water quality sample will be taken immediately for result verification. As water quality results are pending, utility personnel should shut down the well pumps until an appropriate course of action is determined. This would not affect the quality or quantity of water delivered to customers, as the utility has adequate storage for several days.

Appendix B - Form D
Proposed Ground Monitoring Worksheet

Describe the type of ground water monitoring network that could be installed, including the design and location:
First Proposal: Water quality probes and associated sensors could be installed in each source well at a sufficient distance above the well pump to provide continuous water quality monitoring for constituents such as depth, temperature, conductivity, pH, turbidity & dissolved oxygen (DO). Second Proposal: A dedicated monitoring (sentinel) well could be drilled upgradient of the source wells. A water quality probe & associated sensors could be installed in the sentinel well to provide continuous water quality monitoring for constituents such as depth, temperature, conductivity, pH, Turbidity & dissolved oxygen (DO).
How many monitoring (sentinel) wells would need to be established?
First Proposal: None; water quality probes would be in existing source wells. Second Proposal: A location upgradient should be selected based on a hydrogeologic evaluation to provide complete water quality monitoring of the tributary drainage area via one (1) monitoring well. If this is not possible, multiple monitoring wells may be necessary
What is the expected rate of travel of a contaminant through the groundwater system?
First Proposal: Travel times are highly dependent on the 1.) Location of the contaminant source with respect to System sources, 2.) Hydraulic conductivity of geologic formations, which reflects the degree to which fractures are naturally enlarged and 3.) Hydraulic gradient along groundwater flow pathways. As such, travel times vary significantly throughout the SWPA and change as hydrologic conditions change. Second Proposal: Travel times are highly dependent on the 1.) Location of the contaminant source with respect to System sources, 2.) Hydraulic conductivity of geologic formations, which reflects the degree to which fractures are naturally enlarged and 3.) Hydraulic gradient along groundwater flow pathways. As such, travel times vary significantly throughout the SWPA and change as hydrologic conditions change.
Provide the distance from the contaminant source to the monitoring wells:
First Proposal: There are no monitoring wells in place for this utility. Multiple contaminant sources within SWPA; ranging in distance from 83 ft. to 2,611 ft. from System source. Second Proposal: To be determined based on further evaluation of viable monitoring well site locations.
What is the distance of the proposed monitoring equipment to the well head?
First Proposal: N/A; the monitoring equipment described in this option would be in the existing source well. Second Proposal: N/A; the monitoring equipment described in this option would be located in the existing source well.
What would the maintenance plan for the monitoring equipment entail?
First Proposal: It is estimated that the sensors would need to be calibrated monthly and rebuiltor replaced according to the following estimated schedule: Rebuild the pH sensor annually and the DO sensor every 3 years. Replace the conductivity and turbidity sensors and the anti-fouling wiper every 3 years. Second Proposal: It is estimated that the sensors would need to be calibrated monthly andrebuilt or replaced according to the following estimated schedule: Rebuild the pH sensor annually and the DO sensor every 3 years. Replace the conductivity and turbidity sensors and the anti-fouling wiper every 3 years.
Describe the proposed sampling plan at the monitoring site:
First Proposal: Continuous electronic monitoring of the above-named constituents. Second Proposal: Continuous electronic monitoring of the above-named constituents.
Describe the proposed procedures for data management and analysis:
First Proposal: Water quality data is collected on the data logger located at each source well and data is transferred via modem to a web-based data hosting service or local PC using various telemetry technologies. Data parameters would be established, and alarm notifications would be generated when parameters are exceeded. Alarm notifications are sent via email, SMS text message or through color change of map icons at which time manual corrective action would need to occur. Second Proposal: Water quality data is collected on the data logger located at the monitoring well and data is transferred via modem to a web-based data hosting service or local PC using various telemetry technologies. Data parameters would be established, and alarm notifications would be generated when parameters are exceeded. Alarm notifications are sent via email, SMS text message or through color change of map icons at which time manual corrective action would need to occur.

APPENDIX C. COMMUNICATION PLAN TEMPLATE

Deerfield Village Subdivision

PWSID: WV3301979

Authorizing Signature: Stephanie Reel

Contact Phone Number: (304)728-2077

Contact Email Address: sreel@juiwater.net

Plan Developed On: July 2021

ACKNOWLEDGMENTS:

This plan was developed by [insert name, title of person completing plan, and who they work for] to meet certain requirements of the Source Water and Assessment Protection Program (SWAPP) and the Wellhead Protection Program (WHPP) for the State of West Virginia, as directed by the federal Safe Drinking Water Act (SDWA) and state laws and regulations.

INTRODUCTION

Legislative Rule 64CSR3 requires public water systems to develop a Communication Plan that documents how public water suppliers, working in concert with state and local emergency response agencies, shall notify state and local health agencies and the public in the event of a spill or contamination event that poses a potential threat to public health and safety. The plan must indicate how the public water supplier will provide updated information, with an initial notification to the public to occur no later than thirty minutes after the supplier becomes aware that the spill, release or potential contamination of the public water system poses a potential threat to public health and safety.

The public water system has responsibility to communicate to the public, as well as to state and local health agencies. This plan is intended to comply with the requirements of Legislative Rule 64CSR3, and other state and federal regulations.

TIERS REPORTING SYSTEM

This water system has elected to use the Tiered Incident / Event Reporting System (TIERS) for communicating with the public, agencies, the media, and other entities in the event of a spill or other incident that may threaten water quality. TIERS provides a multi-level notification framework, which escalates the communicated threat level commensurate with the drinking water system risks associated with a particular contamination incident or event. TIERS also includes a procedural flow chart illustrating key incident response communication functions and how they interface with overall event response / incident management actions. Finally, TIERS identifies the roles and responsibilities for key people involved in risk response, public notification, news media and other communication.

TIERS provides an easy-to-remember five-tiered **A-B-C-D-E** risk-based incident response communication format, as described below. Table 1 provides also associated risk levels.

A = **A**nnouncement. The water system is issuing an announcement to the public and public agencies about an incident or event that may pose a threat to water quality. Additional information will be provided as it becomes available. As always, if water system customers notice anything unusual about their water, they should contact the water system.

B = **B**oil Water Advisory. A boil water advisory has been issued by the water system. Customers may use the water for showering, bathing, and other non-potable uses, but should boil water used for drinking or cooking.

C = **C**annot Drink. The water system asks that users not drink or cook with the water at this time. Non-potable uses, such as showering, bathing, cleaning, and outdoor uses are not affected.

D = **D**o Not Use. An incident or event has occurred affecting nearly all uses of the water. Do not use the water for drinking, cooking, showering, bathing, cleaning, or other tasks where water can come in contact with your skin. Water can be used for flushing commodes and fire protection.

E = **E**mergency. Water cannot be used for any reason.

Tier	Tier Category	Risk Level	Tier Summary
A	Announcement	Low	The water system is issuing an announcement to the public and public agencies about an incident or event that could pose a threat to public health and safety. Additional information will be provided as it becomes available.
B	Boil Water Advisory	Moderate	Water system users are advised to boil any water to be used for drinking or cooking, due to possible microbial contamination. The system operator will notify users when the boil water advisory is lifted.
C	Cannot Drink	High	System users should not drink or cook with the water until further notice. The water can still be used for showering, bathing, cleaning, and other tasks.
D	Do Not Use	Very High	The water should only be used for flushing commodes and fire protection until further notice. More information on this notice will be provided as soon as it is available.
E	Emergency	Extremely High	The water should not be used for any purpose until further notice. More information on this notice will be provided as soon as it is available.

COMMUNICATION TEAM

The Communication Team for the water system is listed in the table below, along with key roles. In the event of a spill or other incident that may affect water quality, the water system spokesperson will provide initial information, until the team assembles (if necessary) to provide follow-up communication

Water system communication team members, organizations, and roles.

Team Member Name	Organization	Phone	Email
Stephanie Reel	Deerfield Village Subdivision	(304)728-2077	sreel@juiwater.net
Jeff Pippel	Deerfield Village Subdivision	(304)728-2077	jpippel@juiwater.net

In the event of a spill, release, or other incident that may threaten water quality, members of the team who are available will coordinate with the management staff of the local water supplier to:

- Collect information needed to investigate, analyze, and characterize the incident/event
- Provide information to the management staff, so they can decide how to respond
- Assist the management staff in handling event response and communication duties
- Coordinate fully and seamlessly with the management staff to ensure response effectiveness

COMMUNICATION TEAM DUTIES

The communication team will be responsible for working cooperatively with the management staff and state and local emergency response agencies to notify local health agencies and the public of the initial spill or contamination event. The team will also provide updated information related to any contamination or impairment of the source water supply or the system's drinking water supply.

According to Legislative Rule 64CSR3, the initial notification to the public will occur no later than thirty minutes after the public water system becomes aware that the spill, release, or potential contamination of the public water system poses a potential threat to public health and safety.

As part of the group implementing the Source Water Protection Plan, team members are expected to be familiar with the plan, including incident/event response and communication tasks. Specifically, team members should:

- Be knowledgeable on elements of the Source Water Protection Plan and Communication Plan
- Attend team meetings to ensure up-to-date knowledge of the system and its functions
- Participate in periodic exercises that "game out" incident response and communication tasks
- Help to educate local officials, the media, and others on source water protection
- Cooperate with water supplier efforts to coordinate incident response communication
- Be prepared to respond to requests for field investigations of reported incidents
- Not speak on behalf of the water supplier unless designated as the system's spokesperson

The primary spokesperson will be responsible for speaking on behalf of the water system to local agencies, the public, and the news media. The spokesperson should work with the management staff and the team to ensure that all communication is clear, accurate, timely, and consistent. The spokesperson may authorize and/or direct others to issue news releases or other information that has been approved by the system's management staff. The spokesperson is expected to be on call immediately when an incident or event which may threaten water quality occurs. The spokesperson will perform the following tasks in the event of a spill, release, or other event that threatens water quality:

- Announce which risk level (A, B, C, D, or E) will apply to the public notifications that are issued
- Issue news releases, updates, and other information regarding the incident/event
- Use the news media, email, social media, and other appropriate information venues
- Ensure that news releases are sent to local health agencies and the public
- Respond to questions from the news media and others regarding the incident/event
- Appear at news conferences and interviews to explain incident response, etc.

INCIDENT / EVENT COMMUNICATION PROCEDURE

The flow chart in this section illustrates how the water system will respond when it receives a report that a spill, release, or other contamination event may have occurred. Key elements of the flow chart are described below.

Communication with agencies, the public, and the media during threat incidents

Upon initial notification of the incident/event, system managers and staff will collect information and verify the need for further investigation. Only properly trained personnel will perform onsite investigations if permitted by emergency responders. If further investigation is warranted, and the initial facts support it, the water system spokesperson will issue a public communication statement consistent with the threat level. In addition, water system personnel and partners will be dispatched to conduct reconnaissance, a threat assessment, and a threat characterization, if present. This work may include:

- Verification of the incident/event type (spill, release, etc.)
- Location of incident/event
- Type of material(s) involved in spill, release, etc.
- Quantity of material involved
- Potential of the material to move, migrate, or be transported
- Relevant time factor(s) in the risk assessment (e.g., downstream movement rate)
- Overall level of risk to water system, whether low, moderate, high, or very high
- Development of the initial risk characterization

As the flow chart indicates, several iterative cycles will occur after the initial threat assessment, including communication with local agencies and the public, further investigation of the incident, possible implementation of

the water system's contingency plan, and eventual elimination of the threat and a return to normal operations. Communication activities during this period will include:

- The initial release (i.e., Announcement, Boil Water Advisory, Cannot Drink, Do Not Use, or Emergency)
  - Sent to local health agencies, the public, and the news media within 30 minutes
- Notification of the local water system's source water protection and communication teams
  - If warranted by initial findings regarding the spill, release, or incident
- Notification of the WV Bureau of Public Health
  - As required
- Periodic information updates, as incident response information is received
- Updates to the applicable A-B-C-D-E advisory tier, as necessary

If time permits and the need arises, after the threat level is reduced, and operations return to normal, the water system staff, the communication and source water protection teams, and their partners may conduct a post-event review and assessment. The purpose of the review is to examine the response to the incident, relevant communication activities, and overall outcomes. Plans and procedures may be updated, altered, or adapted based on lessons learned through this process.

EMERGENCY SHORT FORMS

Emergency Communication Information

	Name	Phone	Email
Designated spokesperson:	Stephanie Reel	(304)728-2077	sreel@juiwater.net
Alternate spokesperson:	Jeff Pippel	(304)728-2077	jpippel@juiwater.net
Designated location to disseminate information to media:	270 Industrial Blvd. Kearneysville, WV 25430		
Method of Contact:	automated phone tree JUI website Deerfield Village POA website newspaper radio		

Media Contacts:	Name	Title	Phone Number	Email
	Robert Snyder	Editor - Publisher	(304)725-2046	editor@spiritofjefferson.com
Bill Kohler; The Herald Mail Co.	Editor	(301)733-5131	billk@herald-mail.com	The Journal
	(304)263-8931		WRNR – Main Line	304-263-6540
(304)263-6586	info@talkradiowrnr.com	WLTF – Main Line		(304)263-8868
	WKMZ – Main Line		(304)263-2770	
WYII		(304)263-0637		WEPM 1340
304-263-4321	(304)263-8868		WJLA Channel 7	

Emergency Service Contacts

	Name	Emergency Phone	Alternative Phone	Email
Police	Jefferson County Sheriff	(304)728-3205	(304)728-3205	pdougherty@jcsdwv.com
Fire	Shepherdstown Co. #2	(911)___-____	(304)876-2311	
Ambulance	Citizens Fire Co. #1	(911)___-____	(304)725-2814	
Hazmat	Citizens Fire Co. #1	(911)___-____	(304)725-2814	
Other	Citizens Fire Co. #1	(911)___-____	(304)725-2814	
Other				
Other				

Sensitive Populations

Other Communities that are served by the Utility:	None			
Major User/Sensitive Population Notification	Name	Emergency Phone	Alternative Phone	Email
	None			
EED District Office Contact	Name	Phone	Email	
	Alan Marchun	(304)725-9453	alan.f.marchun@wv.gov	
OEHS Readiness Coordinator	Lee Orr	(304)356-4290		

Downstream Water System Contacts	Water System Name	Contact Name	Emergency Phone	Alternate Phone	Email
	None				

Are you planning on implementing the TIER Communications plan?:	Yes

Emergency Service Key Staff Members

	Name	Title	Phone	Email
Key Staff Responsible for Coordinating Emergency Response Rrocedures:		Stephanie Reel	General Manager	(304)728-2077
sreel@juiwater.ne	Jeff Pippel	Chief Operator	(304)728-2077	jpippel@juiwater.net
Staff Responsible for Keeping Confidential PSSC Information and Releasing to Emergency Responders.		Stephanie Reel	General Manager	(304)728-2077
sreel@juiwater.ne	Jeff Pippel	Chief Operator	(304)728-2077	jpippel@juiwater.net

Emergency Response Information

List Laboratories available to perform sample analysis in case of emergency.	Name	Phone
	WV BPH – Bardane District Environmental Laboratory	(304)676-5835
	WV BPH – Bardane District Environmental Laboratory	(304)725-5832
	Reliance Laboratories, Inc.	(304)677-0531
Has utility developed a detailed Emergency Response Plan in accordance with the Public Health Security Bioterrorism preparedness and Response Plan Act of 2002 that covers the following areas?		Yes
When was the emergency response plan developed or last updated?		2021

EMERGENCY CONTACT INFORMATION

State Emergency Spill Notification

1-800-642-3074

Office of Emergency Services

http://www.wvdhsem.gov/

Charleston, WV- (304) 558-5380

WV Bureau for Public Health Office of Environmental Health Services (OEHS)

www.wvdhhr.org/oehs

Readiness Coordinator - Lee Orr

Phone: 304-356-4290

Cell: 304-550-5607

E-mail: Lee.E.Orr@wv.gov

Environmental Engineering Division Staff

Charleston, Central Office (304) 558-2981

Beckley, District 1 (304) 256-6666

St. Albans, District 2 (304) 722-0611

Kearneysville, District 4 (304) 725-9453

Wheeling, District 5 (304) 238-1145

Fairmont, District 6 (304) 368-2530

National Response Center - Chemical, Oil, & Chemical/Biological Terrorism

1-800-424-8802

WV State Fire Marshal's Office

1-800-233-3473

West Virginia State Police

1-304-746-2100

WV Watch – Report Suspicious Activity

1-866-989-2824

DEP Distance Calculator

http://tagis.dep.wv.gov/pswicheck/

PRESS RELEASE ATTACHMENTS

TIERS Levels A, B, C, D, and E

UTILITY ISSUED NOTICE – LEVEL A

PUBLIC WATER SYSTEM ANNOUNCEMENT

A WATER SYSTEM INVESTIGATION IS UNDERWAY

On_____at___:____AM/PM, the_____Water System began investigating an incident that may affect local water quality.

The incident involves the following situation at this location:

_____

_____

_____

There are no restrictions on water use at this time. As always, if water system customers notice anything unusual about their water – such as abnormal odors, colors, sheen, etc. – they should contact the water system at _____.

At this time there is no need for concern if you have consumed or used the water.

Regular updates will be provided about this Announcement as water system staff continue their investigation. Again, there are no restrictions on water use at this time.

State Water System ID#_____Date Distributed: _____

UTILITY ISSUED NOTICE – LEVEL B

BOIL WATER ADVISORY

A BOIL WATER ADVISORY IS IN EFFECT

On_____at___:____am/pm, a water problem occurred causing contamination of your water. The areas that are affected are as follows:

□ Entire Water System or □ Other: _____

_____

CONDITIONS INDICATE THERE IS A HIGH PROBABILITY THAT YOUR WATER IS CONTAMINATED. TESTING HAS NOT OCCURRED TO CONFIRM OR DENY THE PRESENCE OF CONTAMINATION IN YOUR WATER.

What should I do?

- **DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST.** Bring all water to a boil, let it boil for one minute, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, bathing, and food preparation until further notice. Boiling kills bacteria and other organisms in the water.

What happened?

- **The problem is related to** _____

What is being done?

- **The water system is taking the following action:** _____

  _____

What should a customer do if they have consumed or used the water?

- _____

We will inform you when you no longer need to boil your water. We anticipate resolving the problem within _____hours/days. For more information, please contact_____at_____or _____at_____.

General guidelines on ways to lessen the health risk are available from the EPA Safe Drinking Water Hotline at 1 (800) 426-4791.

Please share this information others who use this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice was distributed by _____

State Water System ID#_____Date Distributed: _____

UTILITY ISSUED NOTICE – LEVEL C

"CANNOT DRINK" WATER NOTIFICATION

A LEVEL C WATER ADVISORY IS IN EFFECT

On_____at___:____am/pm, a water problem occurred causing contamination of your water. The areas that are affected are as follows:

□ Entire Water System or □ Other: _____

_____

CONDITIONS INDICATE THERE IS A HIGH PROBABILITY THAT YOUR WATER IS CONTAMINATED. TESTING HAS NOT OCCURRED TO CONFIRM OR DENY THE PRESENCE OF CONTAMINATION IN YOUR WATER.

What should I do?

- **DO NOT DRINK THE WATER.** You can't drink the water, but you can use it for showering, bathing, toilet-flushing, and other non-potable purposes.
- **BOILING WILL NOT PURIFY THE WATER.** Do not drink the water, even if it is boiled.

What happened?

- **The problem is related to** _____

What is being done?

- **The water system is taking the following action:** _____

  _____

What should a customer do if they have consumed or used the water?

- _____

We will inform you when the water is safe to drink. We anticipate resolving the problem within _____ hours/days. For more information – or to report unusual water conditions such as abnormal odors, colors, sheen, etc. – please contact_____at_____or_____at_____.

General guidelines on ways to lessen the health risk are available from the EPA Safe Drinking Water Hotline at 1 (800) 426-4791.

Please share this information others who use this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice was distributed by _____

State Water System ID#_____Date Distributed: _____

UTILITY ISSUED NOTICE – LEVEL D

"DO NOT USE" WATER NOTIFICATION

A LEVEL D WATER ADVISORY IS IN EFFECT

On_____at___:____am/pm, a water problem occurred causing contamination of your water. The areas that are affected are as follows:

□ Entire Water System or □ Other: _____

_____

CONDITIONS INDICATE THERE IS A HIGH PROBABILITY THAT YOUR WATER IS CONTAMINATED. TESTING HAS NOT OCCURRED TO CONFIRM OR DENY THE PRESENCE OF CONTAMINATION IN YOUR WATER.

What should I do?

- **DO NOT DRINK THE WATER.** The water is contaminated.
- **DO NOT SHOWER OR BATHE IN THE WATER.** You can't use the water for drinking, showering, or bathing. It can be used for toilet flushing and firefighting.
- **BOILING WILL NOT PURIFY THE WATER.** Do not use the water, even if it is boiled. The type of contamination suspected is not removed by boiling.

What happened?

- **The problem is related to** _____

What is being done?

- **The water system is taking the following action:** _____

  _____

What should a customer do if they have consumed or used the water?

- _____

We will inform you when the water is safe to drink. We anticipate resolving the problem within _____ hours/days. For more information – or to report unusual water conditions such as abnormal odors, colors, sheen, etc. – please contact_____at_____or_____at_____.

Please share this information others who use this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice was distributed by _____

State Water System ID#_____Date Distributed: _____

UTILITY ISSUED NOTICE – LEVEL E

EMERGENCY WATER NOTIFICATION

A LEVEL E WATER ADVISORY IS IN EFFECT

On_____at___:____am/pm, a water problem occurred causing contamination of your water. The areas that are affected are as follows:

□ Entire Water System or □ Other: _____

_____

CONDITIONS INDICATE THERE IS A HIGH PROBABILITY THAT YOUR WATER IS CONTAMINATED. TESTING HAS NOT OCCURRED TO CONFIRM OR DENY THE PRESENCE OF CONTAMINATION IN YOUR WATER.

What should I do?

- **DO NOT DRINK THE WATER.** The water is contaminated.
- **DO NOT USE THE WATER FOR ANY PURPOSE!** You can't use the water for drinking, showering, or bathing, or any other use – not even for toilet flushing.
- **BOILING WILL NOT PURIFY THE WATER.** Do not use the water, even if it is boiled. The type of contamination suspected is not removed by boiling.

What happened?

- **The problem is related to** _____

What is being done?

- **The water system is taking the following action:** _____

  _____

What should a customer do if they have consumed or used the water?

- _____

We will inform you when the water is safe to drink. We anticipate resolving the problem within _____ hours/days. For more information – or to report unusual water conditions such as abnormal odors, olors, sheen, etc. – please contact_____at_____or_____at_____.

Please share this information others who use this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice was distributed by _____

State Water System ID#_____Date Distributed: _____

APPENDIX D. SINGLE SOURCE FEASIBILITY

Water Source Alternative:

Back up intake	
Name of Alternative:	Backup Well/Intake
Brief Description of the Alternative:	Backup Well/Intake
Feasible?:	No
Provide Cost Estimate:	$0
Would this alternative supply 100% of your needs?:	No
Economic Criteria - Operation and Maintenance Costs:	0
Economic Criteria - Capital Cost:	0
Technical Criteria - Permitting:	0
Technical Criteria - Flexibility:	0
Technical Criteria - Resilience:	0
Technical Criteria - Institutional Requirements:	0
Environmental Criteria - Environmental Impacts:	0
Environmental Criteria - Aesthetic Impacts:	0
Environmental Criteria - Stakeholder Issues:	0
Final Score:	0.00%
Interconnection	
Name of Alternative:	Interconnection
Brief Description of the Alternative:	Interconnection
Feasible?:	No
Provide Cost Estimate:	$0
Would this alternative supply 100% of your needs?:	No
Economic Criteria - Operation and Maintenance Costs:	0
Economic Criteria - Capital Cost:	0
Technical Criteria - Permitting:	0
Technical Criteria - Flexibility:	0
Technical Criteria - Resilience:	0
Technical Criteria - Institutional Requirements:	0
Environmental Criteria - Environmental Impacts:	0
Environmental Criteria - Aesthetic Impacts:	0
Environmental Criteria - Stakeholder Issues:	0
Final Score:	0.00%
Treated water storage	
Name of Alternative:	Treated water storage

Brief Description of the Alternative:	Treated water storage
Feasible?:	Yes
Provide Cost Estimate:	$3,000
Would this alternative supply 100% of your needs?:	No
Economic Criteria - Operation and Maintenance Costs:	2
Economic Criteria - Capital Cost:	2
Technical Criteria - Permitting:	3
Technical Criteria - Flexibility:	3
Technical Criteria - Resilience:	3
Technical Criteria - Institutional Requirements:	3
Environmental Criteria - Environmental Impacts:	3
Environmental Criteria - Aesthetic Impacts:	2
Environmental Criteria - Stakeholder Issues:	3
Final Score:	81.00%
Tank for Raw Water Storage	
Name of Alternative:	Raw Water Storage
Brief Description of the Alternative:	Raw Water Storage
Feasible?:	Yes
Provide Cost Estimate:	$3,000
Would this alternative supply 100% of your needs?:	No
Economic Criteria - Operation and Maintenance Costs:	2
Economic Criteria - Capital Cost:	2
Technical Criteria - Permitting:	3
Technical Criteria - Flexibility:	3
Technical Criteria - Resilience:	3
Technical Criteria - Institutional Requirements:	3
Environmental Criteria - Environmental Impacts:	3
Environmental Criteria - Aesthetic Impacts:	2
Environmental Criteria - Stakeholder Issues:	3
Final Score:	81.00%
Other	
Name of Alternative:	Water Trucked from Other JUI Systems
Brief Description of the Alternative:	Water Trucked from Other JUI Systems
Feasible?:	Yes
Provide Cost Estimate:	$0
Would this alternative supply 100% of your needs?:	Yes
Economic Criteria - Operation and Maintenance Costs:	3

Economic Criteria - Capital Cost:	3
Technical Criteria - Permitting:	3
Technical Criteria - Flexibility:	3
Technical Criteria - Resilience:	3
Technical Criteria - Institutional Requirements:	3
Environmental Criteria - Environmental Impacts:	3
Environmental Criteria - Aesthetic Impacts:	3
Environmental Criteria - Stakeholder Issues:	3
Final Score:	100.00%
Other	
Name of Alternative:	Portable Treatment Trailer
Brief Description of the Alternative:	Portable Treatment Trailer
Feasible?:	Yes
Provide Cost Estimate:	$1,000
Would this alternative supply 100% of your needs?:	No
Economic Criteria - Operation and Maintenance Costs:	1
Economic Criteria - Capital Cost:	3
Technical Criteria - Permitting:	3
Technical Criteria - Flexibility:	3
Technical Criteria - Resilience:	3
Technical Criteria - Institutional Requirements:	3
Environmental Criteria - Environmental Impacts:	3
Environmental Criteria - Aesthetic Impacts:	3
Environmental Criteria - Stakeholder Issues:	3
Final Score:	86.67%

Feasibility Study Narrative

List laboratories (and contact information) on whom you would rely to analyze water samples in case of a reported spill.	**Name**	**Contact**
	WV BPH – Bardane District Environmental Laboratory	(304) 676-5835 (304) 725-5832
	Reliance Laboratories, Inc.	(304) 677-0531
Do you have an understanding of baseline or normal conditions for your source water quality that accounts for seasonal fluctuations?	Yes; for pH and turbidity.	
Does your utility currently monitor raw water (through continuous monitoring or periodic grab samples) at the surface water intake or from a groundwater source on a regular basis?	Yes, pH and turbidity. The system is also contemplating acquiring equipment to monitor conductivity, dissolved oxygen, temperature, total dissolved solids, alkalinity and hardness.	
Provide or estimate the capital and O&M costs for your current or proposed early warning system or upgraded system.	**Capital**	See Appendix E-5, Engineering Evaluation
	Yearly O & M	See Appendix E-5, Engineering Evaluation
Do you serve more than 100,000 customers? If so, please describe the methods you use to monitor at the same technical levels utilized by ORSANCO.	No	

Single Source Feasibility Study

If a public water utility's water supply plant is served by a single–source intake to a surface water source or a single groundwater source, the submitted SWPP must also include an examination and analysis of the technicaland economic feasibility of alternative sources of water to provide continued safe and reliable public water service in the event that its primary source of supply is detrimentally affected by contamination, release, spill event or other reason. These alternatives may include a secondary intake, two days of additional raw or treated water storage, an interconnection with neighboring systems, or other options identified on a local level. Note: This is also applicable if a system is sourced by more than one surface water intake or groundwater well, buteach source draws water from the same surface source or vicinity. A suitable secondary intake or secondary groundwater source would draw water supplies from a substantially different location or water source.

The Deerfield Village system has examined existing or possible alternatives and ranked them by their technical, economic, and environmental feasibility using the feasibility study guide provided by WVBPH. The guide

provides several criteria to consider for each category, organized in a Feasibility Study Matrix. The Feasibility Study matrix and summary of results are presented in an alternatives feasibility study attached as **Appendix D**.

Communication Plan

The Deerfield Village Water System has also developed a Communication Plan that documents the manner in which the public water utility, working in concert with state and local emergency response agencies, shall notify the local health agencies and the public of the initial spill or contamination event and provide updated information related to any contamination or impairment of the source water supply or the system's drinking water supply. The initial notification to the public will occur in any event no later than thirty minutes after the public water system becomes aware of the spill, release, or potential contamination of the public water system. Jefferson Utilities, Inc. will work with local emergency responders to outline communication procedures for both entities in the event of an emergency. The Deerfield Village Water System will update the Communication Plan as needed to ensure contact information is up to date.

The water system has procedures in place for various types of catastrophic spills or other emergencies that can reasonably be predicted at the source location or within the SWPA. The chain-of-command, notification procedures and response actions are known by all water system employees.

The WVBPH has developed a recommended communication plan template that provides a tiered incident communication process to provide a universal system of alert levels to utilities and water system managers. The comprehensive Communication Plan for the Deerfield Village Water System is attached as **Appendix C** for internal review and planning purposes only.

The West Virginia Department of Environmental Protection (WVDEP) is capable of providing expertise and assistance related to prevention, containment, and clean-up of chemical spills. The WVDEP Emergency Response 24-hour Phone is 1-800-642-3074. The WVDEP also operates an upstream distance estimator that can be used to determine the distance from a spill site to the closest public water supply surface water intake.

Emergency Response Short Form

A public water utility must be prepared for any number of emergency scenarios and events that would require immediate response. It is imperative that information about key contacts, emergency services, and downstream water systems be posted and readily available in the event of an emergency. Elements of this SWPP, such as the contingency planning and communication plan, may contain similar information to the utility's emergency response plan. However, the Emergency Response Plan (ERP) is to be kept confidential and is not included inthis SWPP. An Emergency Short Form is included in **Appendix C** to support the Communication Plan by

Appendix D. Single Source Feasibility Study

Despite having three groundwater wells, a single source feasibility study was completed for the Deerfield Village Water System. This study provides an examination and analysis of the technical and economic feasibility of alternative sources of water to provide continued safe and reliable public water service in the event that its primary sources of supply are detrimentally affected by contamination, release, spill event or another reason.

This system already has in place two of the single source alternative options provided in the Feasibility Study Matrix. The Deerfield Village Water System operates using three individual groundwater wells which are within 1,100 feet of one another. These sources are able to supply current demand amounts by running as little as 1.5 hours per day while pumping only two of the three wells. In other words, this system is able to operate at full capacity with a well out of service. In addition to the redundant sources, the water system has in place raw and treated water storage infrastructure capable of providing two days of storage to its customers at a minimum. The below paragraphs describe in detail the results of the Single Source Feasibility Study, and should be considered in addition to the Feasibility Study Matrix.

Backup Intake/Well:

The Deerfield Village Water System determined that it would not be feasible to implement a backup source due to the high cost of such an alternative and because the system is already sourced by multiple wells. While these sources do not each withdraw water from a unique area, the geospatial positioning relative to groundwater flow in the area creates a situation where it is unlikely for a single contamination event to contaminate all three sources at the same time. A more likely scenario of contamination of all three wells would be due to degradation of the source aquifer as a whole; which likely would be a long term threat that the system is capable of predicting yearsin advance using water quality monitoring data over time. For this particular system, a new source that would draw water from a substantially different source or location than the active wells would need to be located quite a distance from the system and its customers. This would necessitate additional infrastructure to deliver the water to the Deerfield Village Water Treatment Plant that is above and beyond this system's economic capabilities.

Interconnection(s) with neighboring water systems:

JUI has determined that an interconnection between the Deerfield Village Water System and another nearby water system is not feasible at this time. This is due largely to the high cost of establishing the necessary infrastructure over such a distance. The nearest water system to Deerfield Village which is owned and operated by JUI is theBurr Industrial Park located more than four miles to the south. The nearest public water system to Deerfield Village not owned and operated by JUI is Shepherdstown Water Department located approximately 2.35 miles away. Another reason that an interconnection is determined to be infeasible is that the Water Truck alternative described in the Feasibility Study Matrix is a far more viable option for this system, and these two alternatives are fundamentally alike. Treated water could be delivered from a nearby system to Deerfield Village in the event of a contamination or other emergency. In other words, the Water Truck alternative offers an " as needed" water delivery mechanism, whereas an interconnection would necessitate excessive infrastructure to implement a permanent water delivery mechanism.

Matrix Document

Feasibility Matrix — Jefferson Utilities, Inc. Deerfield Village Water System — PWSID: 33001979 — 4/8/2016 — Matrix Completed By: Advanced Land and Water, Inc.

Criteria	Question	Backup Intake	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility	Water Trucked from Other [illegible] System(s)	Feasibility	Portable Treatement Trailer (Treatment Alternative Only)	Feasibility
Economic Criteria													
What is the total current budget year cost to operate and maintain the PWSU (current budget		$1,750,495.00		$1,750,495.00		$1,750,495.00		$1,750,495.00		$1,750,495.00		$1,750,495.00	
O and M Costs	Describe the major O&M cost requirements for the alternative?	At this juncture, creation of a backup groundwater or surface water source is economically infeasible and is not open for consideration by this utility. See Appendix D for details.	0	At this juncture, creation of an interconnection is economically infeasible and is not open for consideration by this utility. See Appendix D for details.	0	Costs associated with developing and maintaining infrastructure (tank and piping; possibly pumps as well) which does not currently exist.	2	Costs associated with developing and maintaining infrastructure (tank and piping; possibly pumps as well) which does not currently exist.	2	A 5,000 gallon water truck can be rented for $150 per load. Cost per day to deliver average water demanded is $1,000.	3	A portable treatment trailer can be rented on a month-to-month basis for $40,000-50,000. This cost includes setup and training by "commission personnel" provided by the treatment trailer company. Freight costs up to and perhaps exceeding $2,500 additional each way.	1
	What is the incremental cost ($/gal) to operate and maintain the alternative?	$0.00	0	$0.00	0	$2.00	2	$0.50	2	$0.05	3	$45,000.00	1
	Cost comparison of the incremental O&M cost to the current budgeted costs (%)	0.00%	0	0.00%	0	0.000114%	2	0.000029%	2	0.0000029%	3	2.57%	1
O and M-Feasibility Score			***0.0***		***0.0***		***2.0***		***2.0***		***3.0***		***1.0***
Describe the capital improvements required to implement the alternative.		At this juncture, creation of a backup groundwater or surface water source is economically infeasible and is not open for consideration by this utility. See Appendix D for details.		At this juncture, creation of an interconnection is economically infeasible and is not open for consideration by this utility. See Appendix D for details.		Costs would include construction of the treated water storage facility and piping between the facility and the water treatment plant and the distribution system.		Costs would include construction of the raw water storage facility and piping between the facilty and the source and water treatment plant.		There is no permanent construction costs for this alternative. Total costs are described above.		There is no permanent construction costs for this alternative. Necessary infrastructure to be constructed at the time that this alternative is implemented includes: 8" raw feed to trailer, 8" treated feed to distribution, 2 drain lines (one 3", one 6"), and a power supply (3 phase, 460 Volts). The system is additionally responsible for purchasing caustics, chlorine, and acids to clean the treatment system prior to decommission.	
Capital Costs	What is the total capital cost for the alternative?	$0.00	0	$0.00	0	$3,000.00	2	$3,000.00	2	$0.00	3	$1,000.00	3
	What is the annualized capital cost to implement the alternative, including land and easement costs, convenience tap fees, etc. ($/gal)	$0.00	0	$0.00	0	$0.000416	2	$0.000416	2	$0.00	3	$0.000137	3
	Cost comparison of the alternatives annualized capital cost to the current budgeted costs (%)	0.00%	0	0.00%	0	0.0000000238%	2	0.0000000238%	2	0.00%	3	0.0000000078%	3
Capital Cost-Feasibility Score			***0.0***		***0.0***		***2.0***		***2.0***		***3.0***		***3.0***
Technical Criteria													
Permitting	Provide a listing of the expected permits required and the permitting agencies involved in their approval.	>[List and Describe]	0	>[List and Describe]	0	None; the storage of raw or treated water is not regulated by the state of West Virginia.	3	None; the storage of raw or treated water is not regulated by the state of West Virginia.	3	None; delivery of potable water by truck is not regulated by the state of West Virginia.	3	None	3
	What is the timeframe for permit approval for each permit?	>[List the timeframe for approval for each permit listed above]	0	>[List the timeframe for approval for each permit listed above]	0	N/A	3	N/A	3	N/A	3	N/A	3
	Describe the major requirements in obtaining the permits (environmental impact studies, public hearings, etc.)	>[Describe all major requirements for approval for the listed permits]	0	>[Describe all major requirements for approval for the listed permits]	0	N/A	3	N/A	3	N/A	3	N/A	3
	What is the likelihood of successfully obtaining the permits?	[Describe]	0	[Describe]	0	N/A	3	N/A	3	N/A	3	N/A	3
	Does the implementation of the alternative require regulatory exceptions or variances?	[Yes/No:Describe]	0	[Yes/No:Describe]	0	No; the storage of raw or treated water is not regulated by the state of West Virginia.	3	No; the storage of raw or treated water is not regulated by the state of West Virginia.	3	No; delivery of potable water by truck is not regulated by the state of West Virginia.	3	No	3
Permitting-Feasibility Score			***0.0***		***0.0***		***3.0***		***3.0***		***3.0***		***3.0***
Flexibility	Will the alternative be needed on a regular basis or only used intermittently?	[Describe]	0	[Describe]	0	The nature of treated water storage necessitates the use of said water on a regular basis in order to prevent stagnation and associated water quality issues.	2	The nature of water storage necessitates the use of said water on a regular basis in order to prevent stagnation and associated water quality issues.	2	This alternative would only be used intermittently.	3	This alternative is not owned by the system. The system would have to be rent the treatment trailer and it would only be rented/used as needed.	3
	How will implementing the alternative affect the PWSU's current method of treating and delivering potable water including meeting Safe Drinking Water Act regulations? (ex. In the case of storage, will the alternative increase the likelihood of disinfection byproducts?)	[Describe]	0	[Describe]	0	The treatment process would not differ from what is currently used by the system. As a result, this alternative will not increase the likelihood of disinfection byproducts.	3	The raw water would come from the same sources which are already actively utilized by the system. Therefore the treatment process would be the same for water coming from storage and coming directly from active sources.	3	This alternative would deliver potable water to the Deerfield Village customers which has already been treated to standards at another water treatment plant. In this way this alternative bypasses the Deerfield Village treatment process.	3	This alternative would temporarily replace the Deerfield Village Water Treatment Plant functions should the system need to go offline for any reason. The treatment trailer is designed to produce potable water meeting applicable regulations.	3
Flexibility-Feasibility Score			***0.0***		***0.0***		***2.5***		***2.5***		***3.0***		***3.0***
	Will the alternative provide any advantages or disadvantages to meeting seasonal changes in demand?	[Yes/No]	0	[Yes/No]	0	Yes, the water system will have additional raw water available to them so that the system may not need to increase pumping rates during high demand months.	3	Yes, the water system will have additional raw water available to them so that the system may not need to increase pumping rates during high demand months.	3	The alternative may be used to provide the system with additional treated water during high demand seasons, if necessary.	3	N/A; this represents an alternative treatment option, not an alternative or additional source.	3

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Criteria	Question	Backup Intake	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility	Water Trucked from Other JUI System(s)	Feasibility	Portable Treatement Trailer (Treatment Alternative Only)	Feasibility
Resilience	How resistant will the alternative be to extreme weather conditions such as drought and flooding?	[Yes/No]	0	[Yes/No]	0	This system is served by groundwater wells only. Groundwater sources which are not under direct influence of surface water are intrinsically resistant to weather conditions such as drought and flooding. Additional storage of water which is unaffected by extreme weather conditions can only benefit the system in these situations.	3	This system is served by groundwater wells only. Groundwater sources which are not under direct influence of surface water are intrinsically resistant to weather conditions such as drought and flooding. Additional storage of water which is unaffected by extreme weather conditions can only benefit the system in these situations.	3	The system would have water delivered from another system which uses exclusively groundwater sources. Groundwater sources are generally resistant to the effects of drought and flooding.	3	N/A; this represents an alternative treatment option, not an alternative or additional source.	3
	Will the alternative be expandable to meet the growing needs of the service area?	[Describe]	0	[Describe]	0	This system was originally engineered to meet the demand of the service area at full build out.	3	This system was originally engineered to meet the demand of the service area at full build out.	3	This alternative is limited in its expansion only in the number of trucks available to haul treated water and the amount of time it takes each truck to deliver treated water from another system to the Deerfield Village System.	3	Treatment trailers of varying capacities are available. The system should choose a treatment trailer option based on the size of the system at the time this alternative is implemented.	3
	Resilience-Feasibility Score		*0.0*		*0.0*		*3.0*		*3.0*		*3.0*		*3.0*
Institutional Requirements	Identify any agreements or other legal instruments with governmental entities, private institutions or other PWSU required to implement the alternative.	[Describe]	0	[Describe]	0	None; this alternative represents an expansion of the infrastructure the system already has in place and therefore does not necessitate an agreement with outside entities.	3	None, unless the water system chooses to engineer a water storage facility not on their own property, which is not likely.	3	There would be a service contract between the system and the water truck provider with whom they choose to work. Additionally, Jefferson Utilities, Inc. would have water delivered from another system owned by themselves; therefore no agreement or other legal instrument is necessary.	3	There would be a rental contract between the system and the treatment trailer company with whom they choose to work.	3
	Are any development/planning restrictions in place that can act as a barrier to the implementation of the alternative.	[Yes/No]	0	[Yes/No]	0	No	3	No	3	No	3	No	3
	Identify potential land acquisitions and easements requirements.	[Describe]	0	[Describe]	0	None; this alternative does not require infrastructure to be located on any land that is not already owned by the system.	3	The water system already has space available for a raw water storage facility; therefore the system should not need to aquire additional land or an easement for this alternative.	3	None	3	None	3
	Institutional Requirements-Feasibility Score		*0.0*		*0.0*		*3.0*		*3.0*		*3.0*		*3.0*
	Environmental Criteria												
Environmental Impacts	Identify any environmentally protected areas or habitats that might be impacted by the alternative.	[Describe]	0	[Describe]	0	None	3	None	3	None	3	None	3
	Environmental Impacts-Feasibility Score		*0.0*		*0.0*		*3.0*		*3.0*		*3.0*		*3.0*
Aesthetic Impacts	Identify any visual or noise issues caused by the alternative that may affect local land uses?	[Describe]	0	[Describe]	0	If this alternative were to be implemented as an Above Ground Storage Tank (AST) it would be visible to nearby residents. An alternative, should an AST be opposed, would be to implement underground treated water storage in a wet well.	1	If this alternative were to be implemented as an Above Ground Storage Tank (AST) it would be visible to nearby residents. An alternative, should an AST be opposed, would be to implement underground treated water storage in a wet well.	1	This alternative is not permanent; therefore visual or noise issues would occur only during implementation of this option. Minimal, intermittent truck noise would be present during operation.	3	This alternative is not permanent; therefore visual or noise issues would occur only during implementation of this option. Minimal noise of generators would be present during operation of this alternative, as well as visual presence of a large trailer.	3
	Identify any mitigation measures that will be required to address aesthetic impacts?	[Describe]	0	[Describe]	0	None; if the nearby residents oppose storage of treated water in an AST the system can alternatively store water underground.	2	None; if the nearby residents oppose storage of treated water in an AST the system can alternatively store water underground.	2	None; noise issue would be minimal.	3	None; noise and visual impacts would be minimal.	3
	Aesthetic Impacts-Feasibility Score		*0.0*		*0.0*		*1.5*		*1.5*		*3.0*		*3.0*
Stakeholder Issues	Identify the potential stakeholders affected by the alternative.	[Describe]	0	[Describe]	0	The water system's residential customers represent the only potential stakeholders for this water system.	3	The water system's residential customers represent the only potential stakeholders for this water system.	3	The water system's residential customers represent the only potential stakeholders for this water system.	3	The water system's residential customers represent the only potential stakeholders for this water system.	3
	Identify the potential issues with stakeholders for and against the alternative.	[Describe]	0	[Describe]	0	The stakeholders may have an issue with the aesthetic impacts of the alternative (listed above). In the event that this is the case, the treated water may be stored underground.	2	The stakeholders may have an issue with the aesthetic impacts of the alternative (listed above). In the event that this is the case, the raw water may be stored underground.	2	None; this alternative would be used in emergency situations and not as a permanent solution.	3	None; this alternative would be used in emergency situations and not as a permanent solution.	3
	Will stakeholder concerns represent a significant barrier to implementation (or acceptance) of the alternative?	[Yes/No]	0	[Yes/No]	0	No	3	No	3	No	3	No	3
	Stakeholder Issues-Feasibility Score		*0.0*		*0.0*		*2.7*		*2.7*		*3.0*		*3.0*
	Comments	This is not a feasible option for this water system.		This is not a feasible option for this water system.		Please note that the mitigating measure of constructing an		Please note that the mitigating measure of constructing an		This alternative assumes that another JUI-owned and operated		The above analysis was performed using information provided by Pall	

Instructions: Using the expanded instructions in the "FEASIBILITY STUDY GUIDANCE DOCUMENT", complete the white and gray input cells. Rank each criteria based on the evidence provided and best professional judgement. Rank the criteria 0-3, assuming 0=not feasible and 3=most feasible. The password to edit fillable cells is "swap".

Scoring:

0 – Not feasible. Criterion cannot be met by this alternative and removes the alternative from further consideration.

1 – Feasible but difficult. Criterion represents a significant barrier to successful implementation but does not eliminate it from consideration.

2 – Feasible. Criterion can be met by the alternative.

3 – Very Feasible. Criterion can be easily met by the alternative

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APPENDIX E. SUPPORTING DOCUMENTATION