Source Water Protection Plan

DEERFIELD VILLAGE WATER SYSTEM

PWSID WV3301979

JEFFERSON COUNTY

May 24, 2016

Prepared by:

Jefferson Utilities, Inc. and Advanced Land and Water, Inc.

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Title of Preparer:

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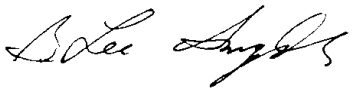
Name of Contractor(s)/Consultant(s) (if used):

Raudenbush Engineering, Inc.

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



Signature of responsible party or designee authorized to sign for water utility:

Lee Snyder

Print Name of Authorizing Signatory (see instructions):

Chief Executive Officer (CEO), Jefferson Utilities, Inc.

Title of Authorizing Signatory:

Date of Submission (mm/dd/yyyy):

05/24/2016

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SOURCE WATER PROGRAM ACRONYMS

ALWI	Advanced Land and Water, Inc.
AST	Aboveground Storage Tank
BMP	Best Management Practices
ERP	Emergency Response Plan
GWUDI	Ground Water Under the Direct Influence of Surface Water
JUI	Jefferson Utilities, Inc.
LEPC	Local Emergency Planning Committee
OEHS/EED	Office of Environmental Health Services/Environmental Engineering Division
PE	Professional Engineer
PSC	Public Service Commission
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	Division of Homeland Security and Emergency Management
ZCC	Zone of Critical Concern
ZPC	Zone of Peripheral Concern

Purpose

The goal of the West Virginia Bureau for 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 Water System 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, the Deerfield Village Water System acknowledges that implementing measures to minimize and mitigate contamination can be a relatively economical way to help ensure the safety of the drinking water.

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 either the sources, or their associated Source Water Protection Areas (SWPAs).

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 (SWAPP), 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 the Deerfield Village Water System can be found in **Table 1**.

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 (SWPP) by July 1, 2016, and must continue to update their plan every three years. Existing SWPPs 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 SWPP 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) (for surface sources) or within the Source Water Protection Area (SWPA) (for groundwater sources).

The code also requires that public water utilities include details regarding PSSCs, protection measures, system capacities, contingency plans, and communication plans. Before a SWPP can be approved, the local health department and public will be invited to contribute information and provide comments for consideration.

System Information

The Deerfield Village Water System 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 SWPP, 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 the Deerfield Village Water System

<table>
<tr><td colspan="2">Administrative office location:</td><td colspan="3">270 Industrial Blvd
Kearneysville, WV 25430</td></tr>
<tr><td colspan="2">Is the system a public utility, according to the Public Service Commission rule?</td><td colspan="3">Yes</td></tr>
<tr><td colspan="2">Date of Most Recent Source Water Assessment Report (SWAR):</td><td colspan="3">January 2008</td></tr>
<tr><td colspan="2">Date of Most Recent Source Water Protection Plan (SWPP):</td><td colspan="3">The system does not have a previous SWPP</td></tr>
<tr><td colspan="2">Population served directly:</td><td colspan="3">120 customers on 48 residential connections</td></tr>
<tr><td rowspan="2">Bulk Water Purchaser Systems:</td><td colspan="2">System Name</td><td>PWSID Number</td><td>Population</td></tr>
<tr><td colspan="2">None; the Deerfield Village Water System is isolated and not interconnected to any other water system.</td><td></td><td></td></tr>
<tr><td colspan="2">Total Population Served by the Utility:</td><td colspan="3">120 customers</td></tr>
<tr><td colspan="2">Does the utility have multiple source water protection areas (SWPAs)?</td><td colspan="3">No, the utility has a single SWPA that encompasses the three groundwater supply wells serving Deerfield Village.</td></tr>
<tr><td colspan="2">How many SWPAs does the utility have?</td><td colspan="3">1</td></tr>
</table>

Water Treatment and Storage

As required, the Deerfield Village Water System 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. The Deerfield Village Water System does not include a surface water intake, as indicated in **Table 3**. Information about the three groundwater sources from which the Deerfield Village Water System draws water can be found in **Table 4**.

Table 2. Deerfield Village Water Treatment Information

Water Treatment Processes (List All Processes in Order)	Membrane Filtration Disinfection (Sodium Hypochlorite) 32,000 gal Contact Tank (30 minute contact time) Pneumatic Tank
Current Treatment Capacity (gal/day)	57,600
Current Average Production (gal/day)	20,000
Maximum Quantity Treated and Produced (gal)	57,600
Minimum Quantity Treated and Produced (gal)	0
Average Hours of Operation	1.5 hours
Maximum Hours of Operation in One Day	24 hours
Minimum Hours of Operation in One Day	0.4 hours
Number of Storage Tanks Maintained	One (1) 32,000 gal concrete finished water vault / contact tank
Total Gallons of Treated Water Storage (gal)	34,500 gal (32,000 gal concrete water vault + 2,500 gal pneumatic tank)
Total Gallons of Raw Water Storage (gal)	2,000

Table 3. Deerfield Village Surface Water Sources

Intake Name	SDWIS #	Local Name	Describe Intake	Name of Water Source	Date Constructed/ Modified	Frequency of Use (Primary/ Backup/ Emergency)	Activity Status (Active/ Inactive)
None	_	_	_	_	_	_	_

Table 4. Deerfield Village Groundwater Sources

Does the utility blend with groundwater?					The utility is served exclusively by groundwater sources.				
Well/Spring Name	SDWIS #	Local Name	Date Constructed/ Modified	Completion Report Available (Yes/No)	Well Depth (ft)	Casing Depth (ft)	Grout (Yes/No)	Frequency of Use (Primary/ Backup/ Emergency)	Activity Status (Active/ Inactive)
Well # 1	TP1	South Paw Lane	2004	Yes	240	60	Yes	Primary	Active
Well #2	TP1	Deerfield Village Drive	2004	Yes	500	63	Yes	Primary	Active
Well #3	TP1	Pathfinder Court	2004	Yes	280	80	Yes	Primary	Active

Delineations

For groundwater supplies, WVBPH makes use of two types of SWPA delineations: 1) wellhead delineations and 2) conjunctive delineations. Conjunctive delineations are developed for supplies identified as groundwater under the direct influence of surface water, or GWUDIs. A Wellhead Protection Area (WHPA) 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 WHPA for the hydrogeologic recharge area (five-year time of travel) and an additionally connected area surrounding a surface water body that contributes water to a groundwater source. Conjunctive delineations, therefore, have been created for GWUDI sources Information and maps of the WHPA for Deerfield Village were provided to the utility and are attached to this report, see **Appendix A Figures.** Other information about the SWPA is shown in **Table 5**.

Table 5. Source Water Protection Area Delineation Information

Size of WSDA (Indicate units)	N/A; The water system does not utilize a surface water source.
River Watershed Name (8-digit HUC)	Conococheague-Opequon (HUC 02070004)
Size of Zone of Critical Concern (Acres)	N/A; The water system does not utilize a surface water source.
Size of Zone of Peripheral Concern (Acres) (Include ZCC area)	N/A; The water system does not utilize a surface water source.
Method of Delineation for Groundwater Sources	The SWPA delineation utilized a 2000-foot fixed radius around the three wells, and was generally based on the five-year time of travel methodology.
Area of Wellhead Protection Area (Acres)	392.886

Protection Team

Communities with successful SWPPs form a Protection Team to help develop and implement management and protection strategies. A Protection Team provides a broader level of oversight of the source water protection effort and includes individuals familiar with protective strategies. Active team members for the Deerfield Village Water System include: water supply staff, representatives from the Jefferson County Department of Planning and Zoning, the Jefferson County School District, and the West Virginia Conservation Agency. A complete list of Protection Team members can be found in **Table 6**. Some government and business agencies were unable to participate in this iteration of the

source water protection effort. Their participation should be sought in future iterations of the SWPP, which is updated at least every three years or as significant changes occur within the SWPA (i.e., changes to PSSCs or sources of water).

With JUI oversight and approval, Advanced Land and Water, Inc. (ALWI) assembled the Protection Team. Members were provided the opportunity to contribute to the development of the SWPP. The Protection Team reviewed the system's existing Source Water Assessment Reports (SWARs), as well as newly collected PSSC data to make informed decisions on potential threats, protective measures, and implementation actions. The Protection Team will continue to be responsible for updating the SWPP in the future and documenting their efforts to engage local stakeholders.

Table 6. Protection Team Member and Contact Information

Name	Representing	Title	Phone Number	Email
Jeff Pippel	Jefferson Utilities, Inc.	**Chief Operator**	-	-
Ralph Dinges	Jefferson County School District	**Assistant Superintendent**	-	-
Jennifer Brockman	Jefferson County Department of Planning and Zoning	**Director**	-	-
Regina (Suzy) Campbell	West Virginia Conservation Agency	**Conservation Specialist**	-	-
Bill Clark	Eastern Panhandle Regional Planning & Development Council	**Director**	-	-
Monica Whyte	West Virginia Bureau for Public Health	**Kearneysville District Environmental Resources Specialist**	-	-
*Bill Zaleski	Jefferson County Health Department	**Sanitation Supervisor: Environmental Section**	-	-
Date of first Protection Team Meeting		April 4, 2016		
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.		

*This representative could not attend the first Protection Team meeting, but expressed interest in assisting with the source water protection effort.

Potential Sources of Significant Contamination

This SWPP provides a comprehensive list of the PSSCs contained within the Deerfield Village Water System SWPA based upon information obtained from the WVBPH, working in cooperation with the Department of Environmental Protection (WVDEP) and the 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. This does not necessarily indicate that any release has occurred.

The database information that utilities received 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 the SWARs and SWPPs. Typical means of identifying and/or confirming the existence of previously identified PSSCs involves performing a desktop Geographic Information System (GIS) analysis, in which a group performs a digital, desktop "reconnaissance" of potential hazards that can be identified and/or verified using a combination of recent orthophotography and state-provided PSSC database information. 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.

Confidentiality of PSSCs

A list of the PSSCs contained within the SWPA is included in the SWPP. However, the exact location, characteristics and approximate quantities of contaminants were made known to one or more designees of the public water utility and maintained in a confidential manner. 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 the Deerfield Village Water System are identified in the communication planning section of this SWPP.

PSSC data from some agencies (e.g., (WVDHSEM). WVDEP, etc.) may be restricted due to the sensitive nature of the data. Geospatial data will be provided to the public water utility. However, to obtain specific details regarding contaminants, (such as information included in Tier II reports), JUI will continue to contact the local emergency planning commission (LEPC) or agencies, directly. Maps and lists of the Non-Confidential SWAP and Regulated PSSCs are provided in **Appendix A Figures**.

Local and Regional PSSCs

For the purposes of this source water protection plan, local PSSCs are those that are identified by the Deerfield Village Protection Team, consultants to JUI, or local stakeholders in addition to the PSSCs lists distributed by the WVBPH and other agencies. Local PSSCs may be identified 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 conduct periodic investigations of their protection area for local PSSCs. A PSSC inventory should identify all contaminant sources and land uses in the delineated SWPA. The second reason local PSSCs are identified is because public water utilities may consider expanding the PSSC inventory effort outside of the SWPA, if necessary, to properly identify threats that could impact the drinking water source(s). As the utility considers threats in the watershed they may consider collaborating with nearby communities to identify and manage regional PSSCs.

When conducting local and regional PSSC inventories, some sources may be obvious like above ground storage tanks, landfills, livestock confinement areas, highway or railroad right of ways, and sewage treatment facilities. Other potential hazards are more difficult to locate like abandoned cesspools, underground tanks, French drains, dry wells, or old dumps and mines.

ALWI completed a desktop GIS survey of the SWPAs to verify the existence of PSSCs previously identified in agency databases and historic documentation. ALWI also reviewed the SWPAs to locate new PSSCs. Information on any new or updated PSSCs can be found in **Table 7**.

Table 7. Locally Identified Potential Sources of Significant Contamination

PSSC Number	Map Code	Site Name	Site Description	Comments
1	C-14	CONFIDENTIAL	Fleet/Truck Terminal	Likely low impact. Significant impervious surface coverage and outdoor storage of transported goods. Recommend further inquiring/analyzing potential contaminant hazards related to facility.
2	R-7	CONFIDENTIAL	Water solution flows through a network of pipes buried 6-8’ underground to heat and cool the residence.	

Prioritization of Potential Threats and Management Strategies

The identified PSSCs have been prioritized by potential threat based on water quality concerns, proximity to system water sources, and other local concerns. 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 SWPP, a critical area is defined as an area, identified by local stakeholders, within or outside of the SWPA, that may contain one or more PSSC(s) and/or within which immediate response would be necessary to address the incident and to protect source waters. To assess potential threats to source waters, the Deerfield Village Protection Team and ALWI have considered information regarding each PSSC.

After identifying local concerns, the Deerfield Village Water System staff developed and prioritized management strategies to protect the source water from contamination, in cooperation and concert with the WVBPH, local health departments, local emergency responders, LEPCs, and other agencies or organizations. This task was completed at the Deerfield Village Protection Team Meeting, hosted at JUI's main office on April 4, 2016. A list of local representatives involved in the decision making process were provided in **Table 6**. Source management strategies are any actions taken to protect the source water from specific PSSCs, categories of PSSCs (e.g., agricultural, commercial, etc.), and critical areas. It is advisable to focus source management strategies on high-priority PSSCs while working with the officials of the county in which the sources are located.

A list of priority PSSCs and critical areas was selected and ranked by the Deerfield Village Water System Protection Team. This list reflects the concerns of JUI and local government representatives and may contain PSSCs not previously identified and not within the SWPA. The list contains a description of why each critical area or PSSC is considered a threat. This information is presented in **Table 8**.

Implementation Plan for Management Strategies

Some examples of management strategies include prohibitions of certain land uses or facilities, design standards, best management practices, operating standards, and reporting requirements are typical source management strategies. Land purchases, conservation easements, and purchase of development rights are also considered source management strategies. As a management strategy, water utilities may also consider notification to and coordination with government agencies during a water supply impairment event. Finally, one strategy all water utilities should implement is periodic surveys of their SWPAs to maintain an active and updated inventory and awareness of potential threats.

A previous SWPP does not exist for the Deerfield Village Water System. As a result, **Table 9** reflects management strategies recommended for this SWPP and does not comment on the status of previously recommended strategies.

For source management and education/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 Protection Team members will 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 SWPP. A system of regular updates should be included in every implementation plan.

Proposed commitments and schedules related to both protection strategies and education/outreach may change. The Deerfield Village Protection Team has developed an implementation plan for each PSSC that is listed in the Prioritization of Threats section. The responsible team member, timeline, and potential cost of each strategy are presented in **Table 9**. Because timeframes, priorities and budgets may change, future plan updates should describe the status of each strategy and explain any 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
Agricultural Land Use	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.
Residential Activities & Septic Systems	Work with the Health Department, to the degree feasible, to encourage homeowners to maintain and routinely inspect their 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.	Suzy Campbell, West Virginia Conservation Agency	Ongoing		Staff time providing informational materials.
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	Within 1 year		JUI staff time providing informational materials.

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	Within 1 year Ongoing		JUI staff time working with property owners and the Department of Planning and Zoning.
Previous Plan Status	*A previous source water protection plan does not exist for this water system. As such, no management strategies have been previously recommended.*				

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 help ensure that affected citizens and other local stakeholders remain informed and are provided an opportunity to contribute to the development of the SWPP. The Deerfield Village Protection Team has created an Education and Outreach plan 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.
BMP lists	Distribute lists of BMPs to the trucking company, and to owners of Agricultural Lands/Facilities within the SWPA.	Jeff Pippel, JUI	Within 1 year		Staff time creating BMP lists using published/provided materials.
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	Within 1 year		Staff time preparing for and hosting workshops.
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.

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.
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.
Display Information	Include informational materials (i.e. brochures, maps, etc.) in county government offices and other public places (i.e., local fairs). Host non-confidential SWPP online for public review and comment.	Deerfield Village Protection Team	Ongoing		Staff time creating and displaying relevant information.
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	Within 1 year		Staff time attending meetings and/or discussions to support the implementation of a sinkhole management plan.

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. The Deerfield Village Water System has examined their capacity to protect their sources, treatment, and distribution system from contamination. They also reviewed their ability to use alternative sources and minimize water loss, as well as their ability to operate during power outages. In addition, this utility has reported the feasibility of establishing an early warning monitoring system and meeting future water demands.

For groundwater sources, diverting or removing contaminated groundwater can be extremely difficult and costly. It may involve removing contaminated groundwater via pump and treat methods, or by implementing other remediation technologies. Systems have contingency plans in place to protect each source and treatment facility during contaminant events. The Deerfield Village Water System can protect their sources by turning off pumps and closing valves to prevent contamination of the treatment plant and/or distribution system. The amount of time that a source can remain offline depends, in part, on the water infrastructure, and should be determined by the utility before an emergency occurs.

For groundwater sources, other factors, such as geologic strata orientation and configuration, contaminant type, contaminant viscosity, and retention also affect the period of time over which a groundwater source may not be usable. The longer a source can remain offline in such a case via interconnections and backup sources, the better equipped and flexible a water system will be for responding to emergency events. Incorporation of advanced treatment options into the water system, while expensive, may also offer additional options during contamination events, with the specific treatment methods dependent on the type of contaminant introduced into the groundwater supply.

Treated water storage capacity also becomes important in the event of an emergency or contaminant release. Storage capacity can directly determine how well a water system can respond to a contamination event and how long intake source can remain offline. Information regarding the water shortage response capability of the Deerfield Village Water System is provided in **Table 11**.

Response Networks and Communication

Statewide initiatives for emergency response, including source water related incidents, are being developed. These include the West Virginia Water/Wastewater Agency Response Network (WV WARN, see http://www.wvwarn.org/) and the Rural Water Association Emergency Response Team (see http://www.wvrwa.org/). The Deerfield Village Water System has analyzed its ability to effectively respond to emergencies and this information is provided in **Table 11**.

Table 11. Deerfield Village Water System Water Shortage Response Capability

Can the utility isolate or divert contamination from the intake or groundwater supply?	No
Describe the utility's capability to isolate or divert potential contaminants:	CONFIDENTIAL
Can the utility switch to an alternative water source or intake that can supply full capacity at any time?	Yes, but dependent on the situation.
Describe in detail the utility's capability to switch to an alternative source:	CONFIDENTIAL
Can the utility close the water intake to prevent contamination from entering the water supply?	Yes
How long can the intake stay closed?	The duration which the system could operate with one or two wells offline would depend on the combined capacity of the remaining source(s) and the time of year that the event occurs. 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 storage capacity of the water system:	32,000 gal concrete water vault 2,500 gal pneumatic tank
Is the utility a member of WVRWA Emergency Response Team?	Yes
Is the utility a member of WV-WARN?	Yes
List any other mutual aid agreements to provide or receive assistance in the event of an emergency:	Generator with Snyder Environmental Verbal agreements with neighboring municipalities

Operation During Loss of Power

The Deerfield Village Water System analyzed and examined 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 shown in **Table 12**.

Table 12. Generator Capacity

What is the type and capacity of the generator needed to operate during a loss of power?	CONFIDENTIAL			
Can the utility connect to generator at intake/wellhead? If yes, select a scenario that best describes system.	CONFIDENTIAL			
Can the utility connect to generator at treatment facility? If yes, select a scenario that best describes system.	CONFIDENTIAL			
Can the utility connect to a generator in distribution system? If yes, select a scenario that best describes system.	CONFIDENTIAL			
Does the utility have adequate fuel on hand for the generator(s)?	Yes			
What is your on-hand fuel storage and how long will it last operating at full capacity?	**Gallons**	**Hours**		
	CONFIDENTIAL	CONFIDENTIAL		
Provide a list of suppliers that could provide generators and fuel in the event of an emergency:	**Supplier**		**Contact Name**	**Phone Number**
	Generator	WVWARN	Bonnie Serrett	304-335-2035
	Generator	Sunbelt Rentals	Associate	301-662-3403
	Fuel	Sunoco	Associate	304-725-1900
	Fuel	Southern States	Associate	304-274-0440
Does the utility test the generator(s) periodically?	Yes, the utility owns a portable generator (fuel capacity 500 gal. or 24 hours) which is currently being used on another job site on a daily basis. When not being used on another job site, it's exercised on a weekly basis.			
Does the utility routinely maintain the generator?	Yes – Snyder Environmental routinely maintains the generator.			
If no scenario describing the ability to connect to generator matches the utility's system or if utility does not have ability to connect to a generator, describe plans to respond to power outages:	The utility has plans in place to have quick-connect infrastructure for generators to all components of the system within the next 3 years.			

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 (future demand). This could mean expanding current sources (e.g., removing water at greater rates than present) or developing new sources in the near future. This can be an expensive and time consuming process, and the water utility should take this into account when determining emergency preparedness. The Deerfield Village Water System 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 Water System

Is the utility able to meet water demands with the current production capacity over the next 5 years? If so, 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.
If not, describe the circumstances and plans to increase production capacity:	N/A; see above.

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 same method used in the Public Service Commission's (PSC) 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 uses such as by the fire departments for fires or training, un-metered bulk sells, flushing to maintain the distribution system, backwashing filters, and cleaning settling basins. By totaling the 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 SWPP, 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 SWPP. The data in **Table 14** is taken from the most recently submitted Deerfield Village Water System PSC Annual Report.

Table 14. Water Loss Information

Total Water Pumped (gal)		213,187,000
Total Water Purchased (gal)		N/A
Total Water Pumped and Purchased (gal)		213,187,000
Water Loss Accounted for Except Main Leaks (gal)	**Mains, Plants, Filters, Flushing, etc.**	1,680,000
	Fire Department	132,000
	Back Washing	1,680,000
	Blowing Settling Basins	536,000
Total Water Loss Accounted For Except Main Leaks		4,028,000
Water Sold- Total Gallons (gal)		141,990,000
Unaccounted For Lost Water (gal)		67,169,000
Water lost from main leaks (gal)		5,465,000
Total gallons of Unaccounted for Lost Water and Water Lost from Main Leaks (gal)		72,634,000
Total Percent Unaccounted For Water and Water Lost from Main Leaks (gal)		34%
If total percentage of Unaccounted for Water is greater than 15%, please describe any measures that could be taken to correct this problem:	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%.	

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 waters. 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 in order to establish what condition is indicative of a contamination event. Continuous monitoring will provide results for a predetermined set of water quality parameters. The more parameters being monitored, the more sophisticated the monitoring equipment will be. When specifying continuous monitoring systems, the utility should consider the logistics of placing and maintaining the equipment, and receiving output data from the equipment.

Alternately, or additionally, a utility may also pull periodic grab samples on a regular basis, or when contaminant incidents occur. The grab samples may be analyzed for specific contaminants, either for ensuring water quality parameters are within baseline levels, or for assessing abnormalities in water quality results that may be spurred by contaminant events. 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 and measured. Consideration should be given for where samples will be collected, the preservations and hold times for samples, available laboratories to analyze samples, and costs associated with the sampling event. JUI collects samples for their source throughout the year to better understand the baseline water quality conditions and natural seasonal fluctuations. Having a baseline helps determine if changes in the water quality are indicative of a contamination event. In addition to required water quality sampling analyses, the Deerfield Village Water System monitors pH and turbidity.

The Deerfield Village Water System has established an early warning monitoring system for detecting chemical threats with sufficient time to respond to protect the treatment facility and public health. The utility has also outlined a communication plan for responding to an early warning that poses a threat to the water quality. This plan incorporates communication with facility owners and operators, with state and local emergency response agencies, with surrounding water utilities, and with the system's customers. Communication plays an important role in knowing how to interpret data and how to respond. The Deerfield Village Water System 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 can be found 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? If 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; one commercial facility within the SWPA.
Are you prepared to detect potential contaminants if notified of a spill?	The utility has the ability to detect potential contaminants that may affect pH or turbidity. Other contaminants, including VOCs and SOCs, require analysis from an outside laboratory.
	Laboratories

List laboratories (and contact information) on whom you would rely to analyze water samples in case of a reported spill.	**Name**	**Contact**
	CONFIDENTIAL	
	CONFIDENTIAL	
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**	CONFIDENTIAL
	Yearly O & M	CONFIDENTIAL
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 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: This is also applicable if a system is sourced by more than one surface water intake or groundwater well, but each 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

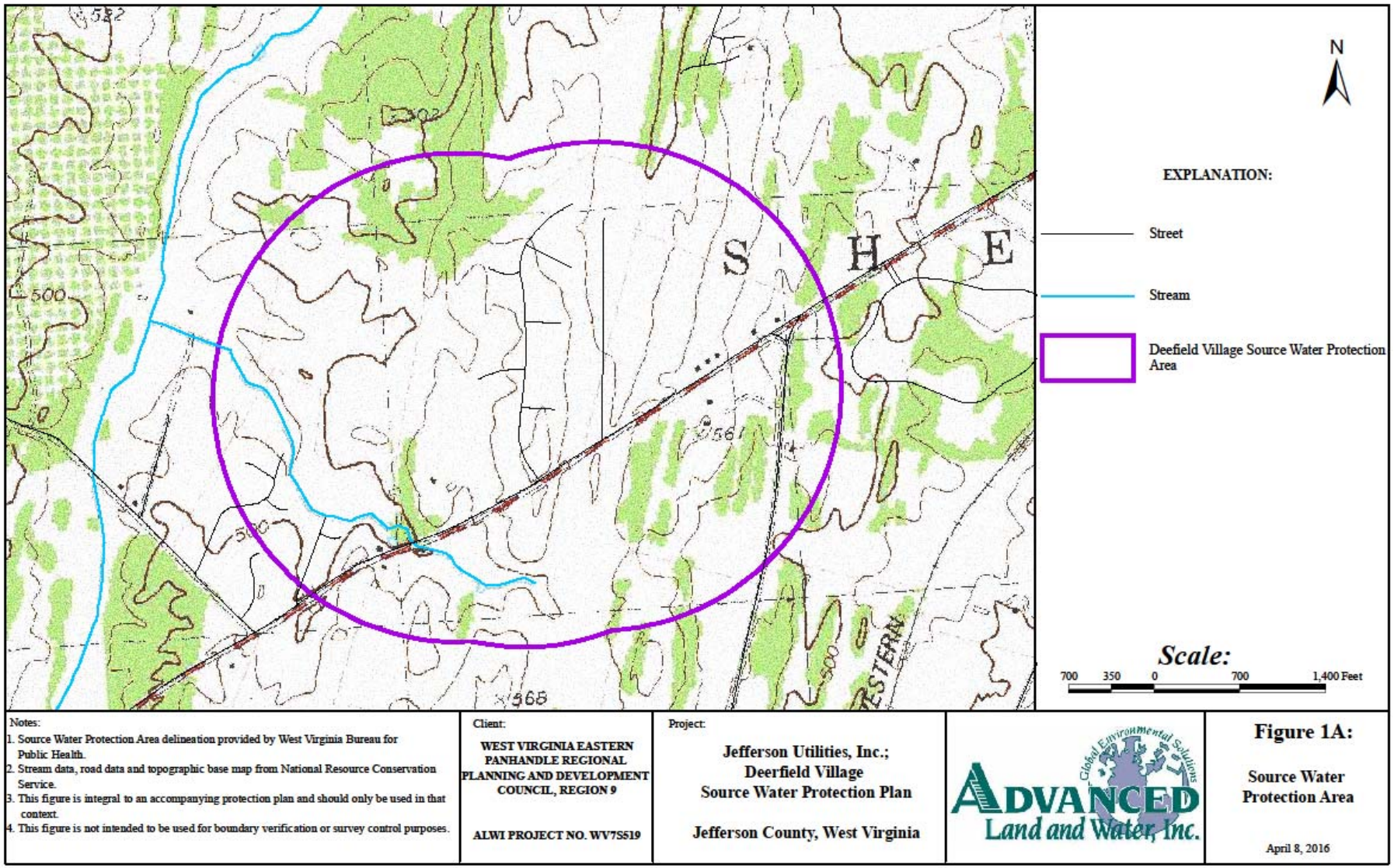
A public water utility must be prepared for any number of emergency scenarios and events that would require immediate response. It is imperative that information about key contacts, emergency services, and downstream water systems be posted and readily available in the event of an emergency. Elements 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 confidential and is not included in this SWPP. An Emergency Short Form is included in **Appendix C** to support the Communication Plan by providing quick access to important information about emergency response.

Conclusion

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

This SWPP is intended to help prepare JUI to properly handle 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. The community 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 SWPP, 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 & Tables



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.

Client:
WEST VIRGINIA EASTERN PANHANDLE REGIONAL PLANNING AND DEVELOPMENT COUNCIL, REGION 9

ALWI PROJECT NO. WV7S519

Project:
Jefferson Utilities, Inc.;
Deerfield Village
Source Water Protection Plan

Jefferson County, West Virginia

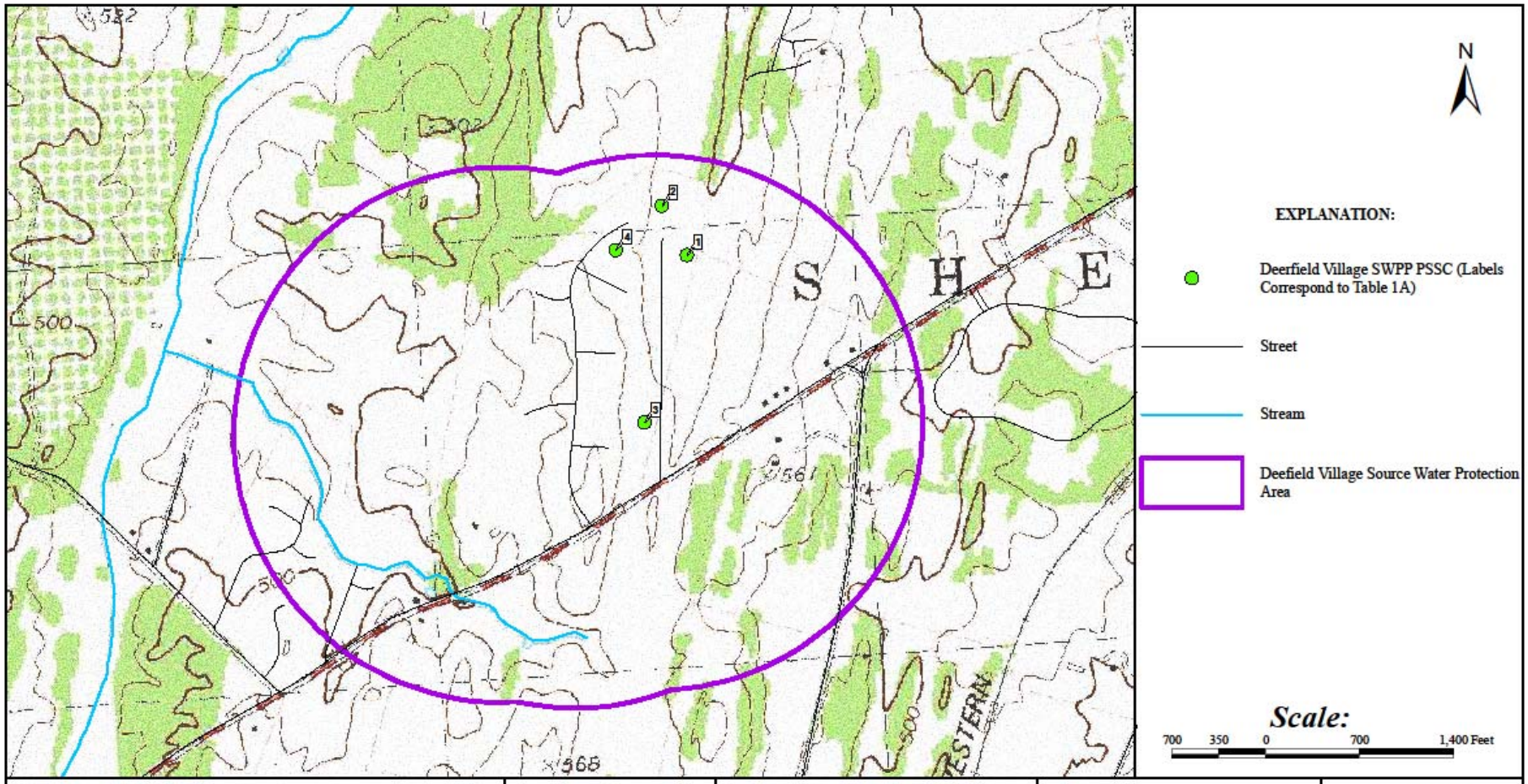
ADVANCED Land and Water, Inc.

Figure 1A:

Source Water Protection Area

April 8, 2016

Map and Table for publicly available Regulated PSSCs are not applicable. There are no publicly available Regulated PSSCs within the Deerfield Village SWPA at the time of this SWPP. See Appendix E-2 for more information.



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.

Client:
WEST VIRGINIA EASTERN PANHANDLE REGIONAL PLANNING AND DEVELOPMENT COUNCIL, REGION 9

ALWI PROJECT NO. WV7S519

Project:
Jefferson Utilities, Inc.
Deerfield Village
Source Water Protection Plan

Jefferson County, West Virginia

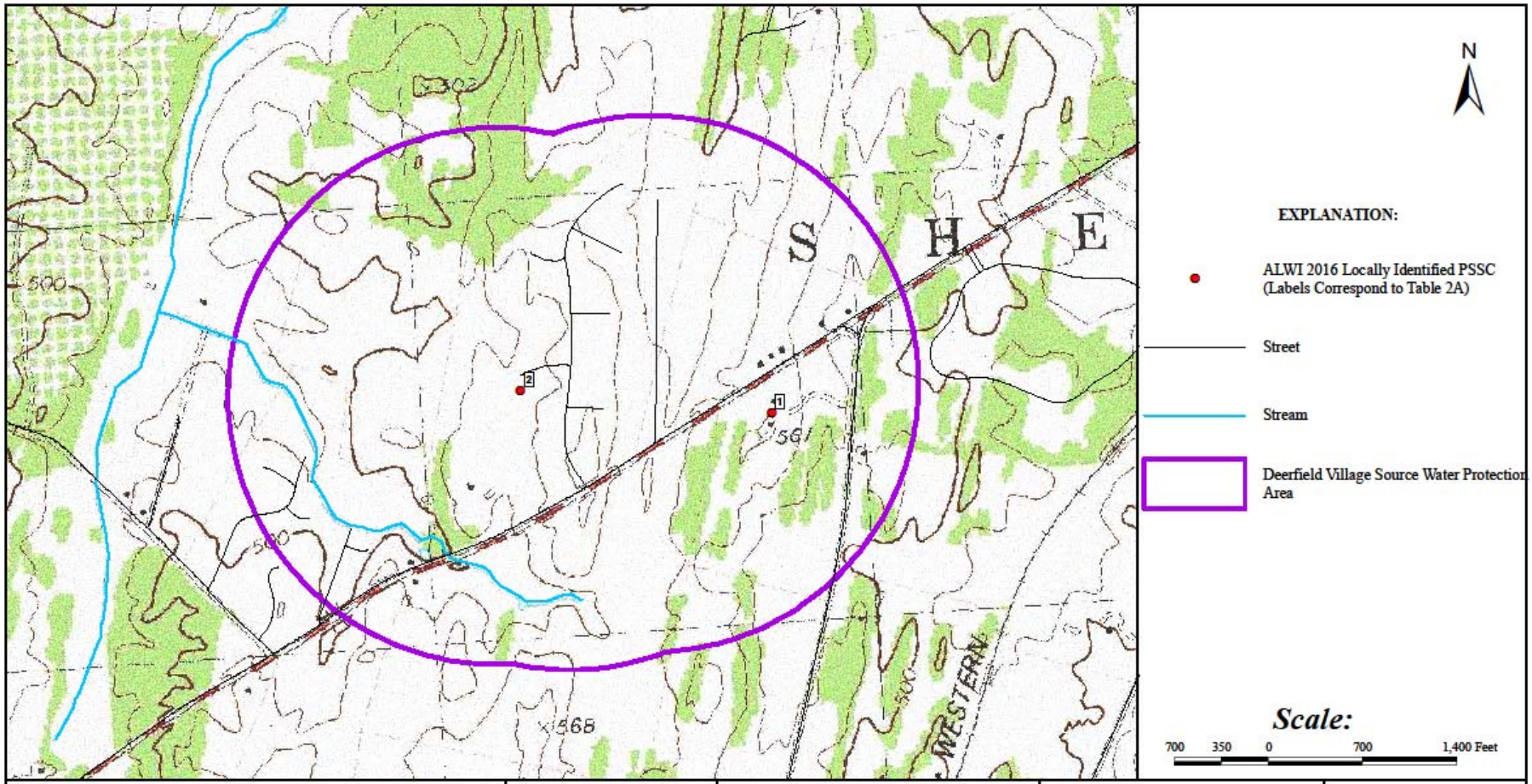
ADVANCED Land and Water, Inc.

Figure 2A:
Previous SWPP PotentialSignificant Sources of Contamination Map

April 8, 2016

Table 1A: List of Previous SWPP PSSCs

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



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.

Client:
WEST VIRGINIA EASTERN PANHANDLE REGIONAL PLANNING AND DEVELOPMENT COUNCIL, REGION 9

ALWI PROJECT NO. WV7S519

Project:
Jefferson Utilities, Inc.
Deerfield Village
Source Water Protection Plan

Jefferson County, West Virginia

ADVANCED Land and Water, Inc.

Figure 3A:
Locally Identified Potential Significant Source of Contamination Map
April 8, 2016

Table 2A: List of Locally Identified PSSCs

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

Appendix B. Early Warning Monitoring System Forms

The following forms have been prepared by WVBPH for use by public utilities, with the proper form dependent on source type (surface or groundwater) and the presence or absence of an early warning monitoring system. The appropriate form for this utility to complete is Form C, as the utility has an existing early warning monitoring system.

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

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

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.

Appendix B- Form A (Not applicable to the Deerfield Village Water System)

Existing Early Warning Monitoring System Worksheet- Surface Water Source

Describe the type of early warning detection equipment installed.
N/A
Describe the mechanism used to store data and an institutional framework to analyze and interpret the data.
N/A
Describe the process used to determine the credibility of a contamination event if a change is detected in the quality of source water.
N/A

Appendix B-Form B (Not applicable to the Deerfield Village Water System)

<u>Proposed</u> Early Warning Monitoring System Worksheet- Surface

Describe the type of early warning detection equipment that could be installed, including the design.
N/A
Where would the equipment be located?
N/A
What would the maintenance plan for the monitoring equipment entail?
N/A
Describe the proposed sampling plan at the monitoring site.
N/A
Describe the proposed procedures for data management and analysis.
N/A

Appendix B-Form C
Existing Early Warning Monitoring System Worksheet - Groundwater Source

Describe the type of early warning detection equipment installed.
CONFIDENTIAL
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 wellhead?
CONFIDENTIAL
Describe the mechanism used to store data and an institutional framework to analyze and interpret the data.
CONFIDENTIAL
Describe the process used 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 Early Warning Monitoring System Worksheet- Groundwater Source

Option 1; Continuous Water Quality Monitoring at Each Source Well.

Describe the type of ground water monitoring network that could be installed, including the design and location.
CONFIDENTIAL
How many monitoring (sentinel) wells would need to be established?
CONFIDENTIAL
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 proposed monitoring wells.
CONFIDENTIAL
What is the distance from the proposed monitoring equipment to the wellhead?
CONFIDENTIAL
What would the maintenance plan for the monitoring equipment entail?
CONFIDENTIAL
Describe the proposed sampling plan at the monitoring site.
CONFIDENTIAL
Describe the proposed procedures for data management and analysis.
CONFIDENTIAL

Appendix B-Form D

Proposed Early Warning Monitoring System Worksheet- Groundwater Source

Option 2; Continuous Water Quality Monitoring via Dedicated Sentinel Well.

Describe the type of ground water monitoring network that could be installed, including the design and location.
CONFIDENTIAL
How many monitoring (sentinel) wells would need to be established?
CONFIDENTIAL
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 proposed monitoring wells.
CONFIDENTIAL
What is the distance from the proposed monitoring equipment to the wellhead?
CONFIDENTIAL
What would the maintenance plan for the monitoring equipment entail?
CONFIDENTIAL
Describe the proposed sampling plan at the monitoring site.
CONFIDENTIAL
Describe the proposed procedures for data management and analysis.
CONFIDENTIAL

Appendix C. Communication Plan

Communication Plan Template

For The Deerfield Village Water System

PWSID: WV3301979 District: IV, Kearneysville

Certified Operator: CONFIDENTIAL

Contact Phone Number:

Contact Email Address:

Plan Developed On: 3/18/2016 Plan Update Due On: 3/18/2019

ACKNOWLEDGMENTS:

This plan was developed by Jefferson Utilities, Inc. 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.

Table of Contents

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. Example press releases are provided as attachments to this plan.

> **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. 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	**A**nnouncement	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	**B**oil 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	**C**annot 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	**D**o 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	**E**mergency	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	Role
CONFIDENTIAL				
CONFIDENTIAL				
CONFIDENTIAL				

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 SWPP, 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 practice 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
- ❑ Agree not to 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 (see example press releases attached)
- ❑ 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:

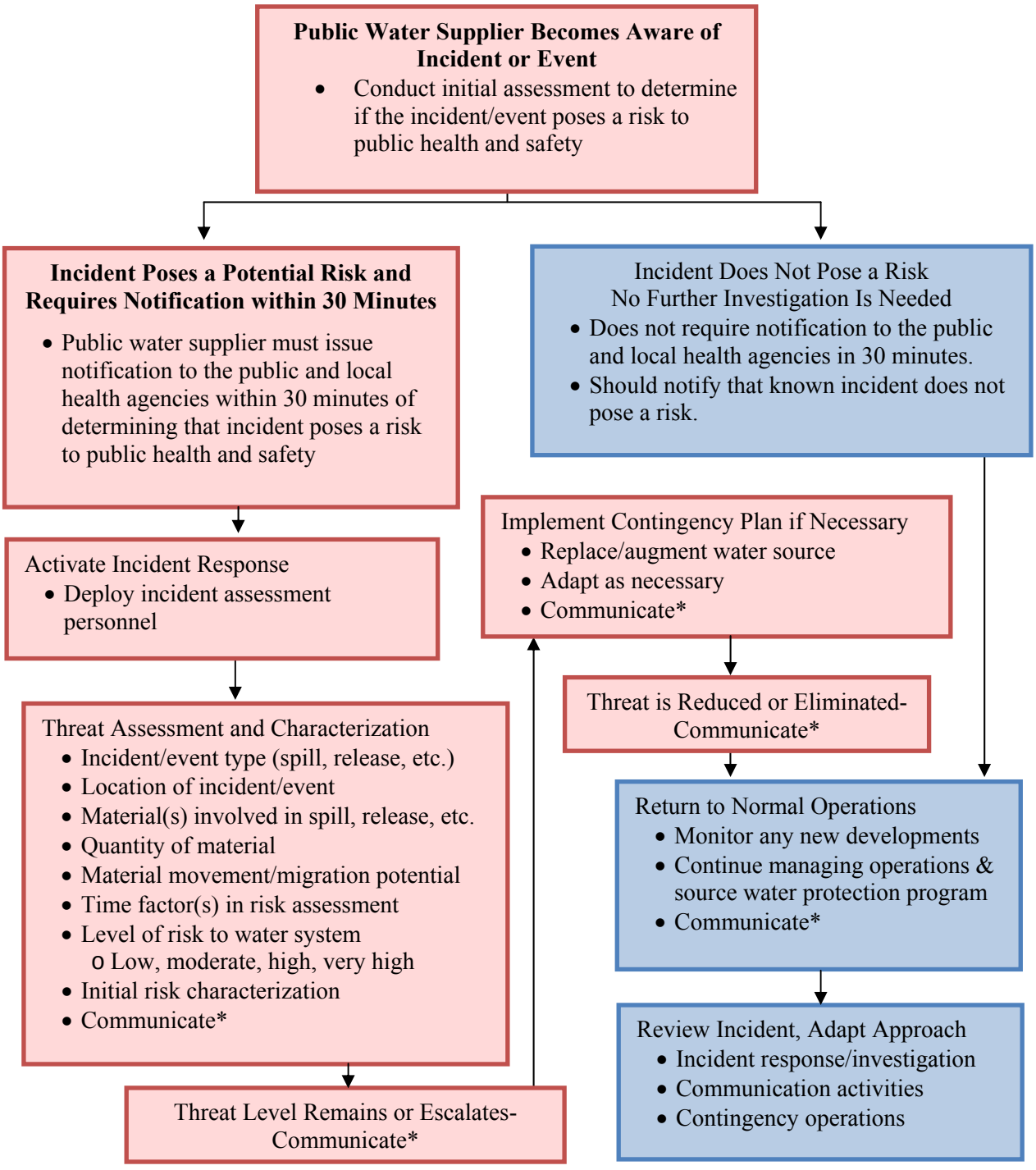
- ❑ Incident/event type (spill, release, etc.)
- ❑ Location of incident/event
- ❑ Type of material(s) involved in spill, release, etc.
- ❑ Quantity of material involved
- ❑ Potential of the material to move, migrate, or be transported
- ❑ Relevant time factor(s) in the risk assessment (e.g., downstream 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., **A**nnouncement, **B**oil Water, **C**annot Drink, **D**o Not Use, or **E**mergency attached)
    - o 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
    - o If warranted by initial findings regarding the spill, release, or incident
- ❑ Notification of the WV Bureau of Public Health
    - o As required
- ❑ Periodic information updates, as incident response information is received
- ❑ Updates to the applicable A-B-C-D-E advisory tier, as necessary

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 will 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.

TIERS Flow Chart



Communicate*
Constant communication with local agencies, public, and the media is critical throughout the entire process. The initial notification should include all pertinent information, depending on the TIERS level. Regular information updates should be provided. The **A-B-C-D-E** TIERS levels should be updated and explained as necessary.

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. 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 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, 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: _____

Emergency Short Forms

Emergency Communication Information

	Name	Phone Number	Email
Designated spokesperson:	Stephanie Glascock	304-728-2077	sglascock@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		
Methods of contacting affected residents:	**Automated Phone Tree, JUI Website, Deerfield Village POA Website, Newspaper and Radio.**		

	Name	Title	Phone Number	Email
Media contacts:	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 ext. 125	_
	WRNR – Main Line	-	304-263-6586 / 304-263-6540	info@talkradiowrnr.com
	WLTF – Main Line	-	304-263-8868	_
	WKMZ – Main Line	-	304-263-2770	
	WYII	-	304-263-0637	-
	WEPM 1340	-	304-263-8868 / 304-263-4321	-
	WHAG Channel 25	-	301-797-4400	-

Emergency Services Contacts

	Name	Emergency Phone	Alternate Phone	Email
Local Police	Jefferson County Sheriff	(304) 728-3205	304-728-3205	pdougherty@jcsdwv.com
Local Fire Department	Shepherdstown Co. #2	911	304-876-2311	
	Citizens Fire Co. #1	911	304-725-2814	
Local Ambulance Service	Citizens Fire Co. #1	911	304-725-2814	
Hazardous Material Response Service	Citizens Fire Co. #1	911	304-725-2814	

Key Personnel

	Name	Title	Phone	Email
Key staff responsible for coordinating emergency response procedures?	CONFIDENTIAL			
	CONFIDENTIAL			
Staff responsible for keeping confidential PSSC information and releasing to emergency responders:	CONFIDENTIAL			
	CONFIDENTIAL			
Are you planning on implementing the TIER system?	Yes			

Emergency Response Information

Has the utility developed a detailed Emergency Response Plan in accordance with the Public Health Security Bioterrorism Preparedness and Response Pan Act of 2002?	Yes
When was the Emergency Response Plan developed or last updated?	February 24, 2016

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- Warren Von Dollen
Phone; 304-356-4290
Cell; 304-550-5607
e-mail; warren.r.vondollen@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/

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 years in 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 the Burr 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.

Appendix E. Supporting Documentation

Appendix E-1. ALWI PSSC Update and Source Inspection

Appendix E-2. Locally Identified and Public Regulated PSSC Database Search

Appendix E-3. The Deerfield Village Water System Protection Team Meeting Minutes

Appendix E-4. Emergency Response Plan Signature Page

Appendix E-5. Engineering Evaluation

Appendix E-1. ALWI PSSC Update and Source Inspection

Advanced Land and Water, Inc. (ALWI) performed regulatory database reviews and a desktop review/reconnaissance in order to identify changes to known PSSCs and to identify and record additional PSSCs not previously documented. The desktop review/reconnaissance also included verifying water source locations and reviewing the delineated SWPA. Both point sources and non-point sources of contamination were considered during our desktop review.

Appendix E-2. Locally Identified and Public Regulated PSSC Database Search

ALWI incorporated information from the following state-maintained environmental databases to supplement the non-confidential point-source hazard inventories, with the date of database publication provided parenthetically as follows:

- WV Department of Agriculture; Pesticide Program Database search for Pesticide Businesses, Regulated Pesticide Application Businesses (RPAB), Pesticide Dealers and Commercial Applicators (2/10/2016);

- WV DEP Office of Environmental Remediation; Public Record of Voluntary Cleanup Program Sites (2/10/2016);

- Underground Storage Tank and Leaking Underground Storage Tank Databases (2/10/2016);

- EPA System Data Search of RCRAInfo Database for Resource Conservation and Recovery Act (RCRA) sites (2/10/2016).

The databases helped with interpretations of groundwater susceptibility, in that the listed facilities may be generators of hazardous materials, petroleum products and/or other drinking water contaminants.

Appendix E-3. The Deerfield Village Water System

Protection Team Meeting Minutes

Jefferson Utilities, Inc.

Deerfield Village Water System

Protection Team Meeting

April 4, 2016

270 Industrial Blvd. Kearneysville, WV

Participants in Attendance:

Jeff Pippel	Jefferson Utilities Operations Manager
Sarah Taggart	Advanced Land and Water, Inc.
Stephen M. Gyurisin	Advanced Planning Associates, LC
Bill Clark	Eastern Panhandle Regional Planning and Development Council (Region 9)
Monica Whyte	West Virginia Bureau for Public Health
Ralph Dinges	Jefferson County School District
Suzy Campbell	West Virginia Conservation Agency
Jennifer Brockman	Jefferson County Department of Planning and Zoning

Interested Participants Who Could Not Attend:

Bill Zaleski	Jefferson County Health Department

Invitees Who Declined Invitation:

Barbara Miller	Jefferson County OHSEM Director
Alana Hartman	West Virginia Department of Environmental Protection
John Reisenweber	Jefferson County Development Authority
Jennifer O'Brien	Eastern Panhandle Regional Planning and Development Council (Region 9)
David Hartley	Eastern Panhandle Home Builders Association

Invitees Who Did Not Respond:

Matt Pennington	Chesapeake Bay Coordinator
Amy Panzarella	Jefferson County Chamber of Commerce, Inc.
Christina Jackson	Jefferson County Health Department
Lew Baker	West Virginia Rural Water Association
Michael Blue	Jefferson County Farm Bureau
Tim Canfield	USDA NRCS District Conservationist
Michael Harman	West Virginia University Extension Office
Todd Coyle	Earth Vibe Productions & Events, LLC

Stephanie Grove.....Jefferson County Commission, Administrator
J. Lee Thorne .....Jefferson County Department of Transportation
Elizabeth McDonald .....Jefferson County Farmland Protection Board
Nathan Ware .....Department of Transportation, Supervisor
Dale Manuel.....Jefferson County Commission

Meeting Objectives:

The purpose of this meeting was to establish a Protection Team, an entity which will work to forward source water protection efforts and strategies for the Deerfield Village Water System, which is owned and operated by Jefferson Utilities, Inc. (JUI). More specifically, the Protection Team worked to prioritize the major Potential Significant Sources of Contamination (PSSCs), critical areas, and other threats deemed of greatest concern to the system's three groundwater supply wells. Management Strategies and Implementation Plans were developed for the highest priority threats. Education and Outreach Strategies also were discussed, and Implementation Plans were created for these and other management activities. Finally, the Protection Team reviewed additional general recommendations ALWI made for the water system.

Timeline of Events:

Following formal introductions from Protection Team members in attendance, ALWI staff began a PowerPoint presentation in which we explained both the hydrologic and hydrogeologic setting of Jefferson County and broadly covered general system information pertaining to water source locations and delineated areas that influence system sources, termed Source Water Protection Areas (SWPAs). Deerfield Village has three groundwater wells which each have a corresponding Wellhead Protection Area (WHPA). When combined, the WHPAs form the entire SWPA. From there, ALWI introduced their list of prioritized PSSCs, management strategies related to those PSSCs, and education and outreach strategies to engage and educate the public on source water protection efforts. ALWI then asked the Protection Team to opine on their PSSC list and adjust prioritization, if and where appropriate. The Protection Team discussed implementation measures for protection strategies, as well as education and outreach strategies, and assigned responsibility to Protection Team members who volunteered to handle each strategy. The meeting, which began at approximately 3:00 PM, was adjourned at 4:15 PM.

Deerfield Village Water System Specific Discussions:

During the presentation, ALWI displayed maps and shared information pertaining to Rockymarsh Run, a surface water body which intermittently flows through the SWPA. Rockymarsh Run may be eligible for a Section 319 Non-point Source Management Program in the future. If this is implemented, the management programs offered could be of great benefit to the system, if employed within the Deerfield Village SWPA. ALWI presented maps of the SWPA and the Regulated and Previously Identified PSSCs as well as Locally Identified PSSCs located within the SWPA. ALWI identified PSSCs and recommended critical areas within the Deerfield Village SWPA which, in their professional opinion, pose the greatest threat to the system. These were presented and discussed, with ALWI staff explaining the basis for each potential threat. Prior to the meeting, ALWI had prioritized these potential threats, as follows (in order from highest priority to lowest priority):

1. Agricultural Activities
2. Residential Activities & Septic Systems
3. Commercial Activities

4. Nearby Surface Water Bodies
5. Sinkholes

ALWI asked that the Protection Team consider the threats, add additional threats conceived by the team, assess the prioritization of the threats, and make appropriate revisions to prioritization. The Protection Team did not recommend revisions to the ALWI-identified and prioritized list of PSSCs and critical areas.

Next, management strategies developed and recommended by ALWI for each of these priority PSSC categories were discussed. During the discussion, Protection Team members volunteered to handle implementation of the recommended management strategies. Relevant management and implementation strategies were discussed as follows:

- **Agricultural Activities** – The Protection Team discussed the extensive agricultural land uses throughout the SWPA, focusing on the introduction of bacteriologicals and nutrients into surface waters that may recharge the groundwater system. Discussions focused on agricultural lands that lacked adequate riparian buffer zones near stream corridors and pastoral lands that permitted livestock direct access to stream corridors. Mrs. Suzy Campbell of the West Virginia Conservation Agency indicated that her organization has provided cost-sharing opportunities to land owners for installation of livestock exclusion fencing on their lands. Mrs. Campbell volunteered her agency to continue reaching out to landowners to discuss livestock exclusion fencing, riparian zone restoration, implementation of nutrient management plans, cover crops, and other management practices that would help reduce non-point pollution originating from agricultural and pastoral lands. ALWI recommended the use of grant funding opportunities to promote implementation of many of these management practices, and/or educational outreach about programs that have no cost to the landowner (such as the nutrient management plan program) and those that provide economic incentives to landowners who participate in land retirement programs, including the Conservation Reserve Enhancement Program (CREP).

- **Residential Activities & Septic Systems** – The Protection Team discussed current land uses in the SWPA, and additionally discussed that the area is almost entirely "built out" from a residential, commercial and industrial perspective. As a result, management strategies will focus on education and outreach to current residents, rather than working to implement future development restrictions. Excluding the Deerfield Village Subdivision, the residential development within the SWPA utilizes private wells and septic systems. The difficulty of identifying a failing septic system in karst terrain was discussed, and will be considered a priority in the list of topics to focus on when educating residents on source water protection measures. Suzy Campbell indicated that the West Virginia Conservation Agency provides cost-sharing initiatives to pump and maintain residential septic systems. This program also promotes proper maintenance of septic systems through educational and outreach activities.

- **Commercial Activities** – There is a single identified commercial facility within the Deerfield Village SWPA. The Protection Team felt it would be appropriate to provide site-specific Best Management Practice (BMP) documents to this commercial facility to raise awareness about source water protection efforts and to help ensure that potential contaminants are stored and disposed of using best available methods. The Protection Team also felt that it is important to inquire with the facility owner whether there is vehicle fuel stored on-site, and if so in what quantity. This

information would help the Protection Team to more accurately prioritize the threat level of this PSSC.

- **Sinkholes** – The Protection Team discussed the threats that sinkholes pose to the Deerfield Village Water System as a whole, as well as education and outreach strategies to raise public awareness about sinkholes and to promote homeowner action. The Protection Team also focused on the feasibility of creating a County-Wide Sinkhole Management Program specific to SWPAs. While it was agreed upon that the current public climate is against such zoning restrictions, the Protection Team discussed how best to be prepared to implement a plan in the future. Ms. Jennifer Brockman of the Jefferson County Department of Planning and Zoning asked if the Jefferson County Commission is being kept up to speed on the Source Water Protection efforts occurring throughout the state. She believes that if a presentation were made to the County Commission explaining the program and the limitations faced in implementing protection strategies without regulation, then the commission might be able to serve as the driving force behind a county-wide sinkhole management plan. Ms. Monica Whyte of the West Virginia Bureau for Public Health offered to reach out to the County Commission in this regard. Although several members of the Jefferson County Commission were invited to participate on this Protection Team, all unfortunately did not respond.

Also during this meeting, Education and Outreach Strategies recommended by ALWI were discussed, and responsible members were chosen for each category. The discussion focused on the Deerfield Village Public Workshop, which is required as part of this source water protection effort. The Public Workshop for the Deerfield Village Water System will take place at the JUI main office (270 Industrial Blvd., Kearneysville) on April 20, 2016. ALWI will reach out to the Deerfield Village Property Owners Association (POA) and to the nearby Willow Springs Acres homeowners association (HOA) to publicize this event. JUI also will host an informational bulletin on their website prior to the meeting.

Appendix E-4. Emergency Response Plan Signature Page

EMERGENCY RESPONSE PLAN
WATER SECTOR

Public Water System Name: Jefferson Utilities, Inc.
Deerfield Village Water System

PWSID No: WV3301979

Physical Address: 270 Industrial Blvd.
City: Kearneysville
State: West Virginia
Zip Code: 25430
General Phone Number: (304) 728-2077

Population Served: 48 connections
Municipalities Served: 1

Prepared by (signature & title): [signature] operations manager

Reviewed by (signature & title): Stephanie Glascock, General Manager

Date Completed: February 24, 2016

Date Revised: February 24, 2016

Appendix E-5. Engineering Evaluation

CONFIDENTIAL

Jefferson Utilities, Inc.; Deerfield Village Water System

Public Outreach and Involvement Summary

The Protection Team: Efforts to engage local stakeholders, government entities and specific members of the community in forming the Deerfield Village Source Water Protection Team are listed below.

1. ALWI provided JUI a recommended list of entities (including local stakeholders, government officials, etc.) to consider inviting to participate on the Protection Team. This list also contained contact information for each potential invitee in at least one form, including a mailing address, email and/or phone number.
2. On behalf of JUI, ALWI sent a formal invitation to each invitee selected by JUI from the above mentioned list, by mail and electronically (email).
3. RSVPs were received by ALWI over the next week, and reported to JUI prior to the Protection Team Meeting, which was held on April 4, 2016. The System's Source Water Protection Plan (SWPP) documents which invitees responded, and which were willing to participate on the Protection Team.
4. The corresponding minutes for the April 4, 2016 Protection Team Meeting can be found in Appendix E-3 of the Deerfield Village SWPP.

The Public Workshop: Efforts to publicize the Deerfield Village Source Water Protection Public Workshop are listed below.

1. A Press Release was developed and provided to both JUI and the Eastern Panhandle Regional Planning & Development Council (Region 9). The press release has been distributed to the local media and posted on the JUI Facebook page, as well as the Region 9 website. The Press Release was also forwarded to the residents of the Deerfield Village Community, specifically.

The SWPP Report: Efforts to inform the public of the SWPP update and to receive comments and opinions on the content of the report are listed below.

1. ALWI created a SWPP Summary PowerPoint presentation for Region 9 to host on their website. This afforded the public an opportunity to view general SWPP information prior to the Draft SWPP being uploaded for public review and comment.
2. A public version of the SWPP Draft was posted on the JUI and Region 9 websites for the public to opine on, prior to final submittal of the plan to WV BPH. At the close of the public comment period (May 23, 2016), ALWI discussed comments received with JUI and updated the SWPP accordingly.