Source Water Protection Plan Craigsville Public Service District

PWSID WV3303402 Nicholas County

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In cooperation with Craigsville PSD



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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:

Print Name of Authorizing Signatory:

Title of Authorizing Signatory:

Date of Submission:



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SOURCE WATER PROGRAM ACRONYMS

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



1.0 PURPOSE

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

The intent of this document is to describe what Craigsville Public Service District (PSD) 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, Craigsville PSD acknowledges that implementing measures to minimize and mitigate contamination can be a relatively economical way to help ensure the safety of the drinking water.

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

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

2.0 BACKGROUND: WV SOURCE WATER ASSESSMENT AND PROTECTION PROGRAM

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

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

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

3.0 STATE REGULATORY REQUIREMENTS

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

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

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



4.0 SYSTEM INFORMATION

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

Table 1.	Population	Served	by Craigs	sville PSD
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Administra	tive office location:		P.O. Box 368 Craigsville, WV 26205		
Is the system a public utility, according to the Public Service Commission rule?			Yes		
Date of Most Recent Source Water Assessment Report:			December 2002		
Date of Most Recent Source Water Protection Plan:			August 2011		
Population served directly:			Craigsville PSD directly serves an estimated population of 1,932 customers, or 4,830 people*.		
System Name PWSID			Number Population		
Bulk Water Purchaser Systems: Camden on Gauley WV3			Craigsville PSD supplies Camden on Gauley's entire system, which is about 221 customers or 552 people*.		
Total Population Served by the Utility:			The utility serves a total estimated population of 5,382* people.		
Does the utility have multiple source water protection areas (SWPAs)?			No		
How many SWPAs does the utility have?			1		

*Estimated population served equals the number of customers multiplied by 2.5

5.0 WATER TREATMENT AND STORAGE

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

Table 2. Craigsville PSD Water Treatment Information

Water Treatment Processes (List All Processes in Order)	Water treatment processes include coagulation, filtration, fluoridation, and chlorination.
Current Treatment Capacity (gal/day)	The current treatment capacity of the water plant is 806,400 gallons/day (560 gallons/minute for 24 hours).
Current Average Production (gal/day)	Average production is around 500,000 gallons/day.
Maximum Quantity Treated and Produced (gal)	The maximum amount of water produced in the last calendar year was approximately 786,000 gallons on 8/15/13.
Minimum Quantity Treated and Produced (gal)	The minimum amount of water produced in the last calendar year was 324,000 gallons on 11/4/13
Average Hours of Operation	The treatment plant is operated an average of 14.5-16 hours per day.
Maximum Hours of Operation in One Day	The maximum number of hours of operation in a single day in the last year was 23 hours.
Minimum Hours of Operation in One Day	The minimum number of hours of operation in a single day in the last year was 10 hours.
Number of Storage Tanks Maintained	The water system maintains 5 treated water storage tanks and 3 booster pump stations.
Total Gallons of Treated Water Storage (gal)	Total treated water storage capacity is around 966,000 gallons.
Total Gallons of Raw Water Storage (gal)	The water system does not have any raw water storage.

*This information was taken from the 2014 Public Service Commission Annual Report for Craigsville PSD

Table 3. Craigsville PSD S	urface Water Sources
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Intake Name	SDWIS #	Local Name	Describe Intake	Name of Water Source	Date Constructed/ Modified	Frequency of Use (Primary/ Backup/ Emergency)	Activity Status (Active/ Inactive)
Gauley River Intake	IN001	Raw Water Intake	Water enters the plant through T-shaped intake pipe that is capped on the upstream side and open on the downstream side. The water flows from the pipe into a 24" raw water pit, then is pumped into the plant.	Gauley River	1962	Primary	Active

Table 4. Craigsville PSD Groundwater Sources

Does the utility blend with groundwater?								No	
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)
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

6.0 DELINEATIONS

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

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

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

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

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

Table 5. Watershed Delineation Information

Size of WSDA (Indicate units)	The WSDA covers approximately 246 square miles.
River Watershed Name (8-digit HUC)	Gauley River Watershed- 05050005
Size of Zone of Critical Concern (Acres)	The ZCC covers approximately 11,517 acres.
Size of Zone of Peripheral Concern (Acres) (Include ZCC area)	The ZPC covers approximately 26,802 acres, including the ZCC.
Method of Delineation for Groundwater Sources	N/A-The water system does not have any groundwater sources.
Area of Wellhead Protection Area (Acres)	N/A



7.0 PROTECTION TEAM

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

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

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

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

Table 6. Protection Team Member and Contact Information

Name		Representing		Title	Phone Number	Email	
Lundy Bailey		Craigsville PSD		Chief Operator	(WTP) 304-742-3585	chief.operator@yahoo.com	
Gary Robinson		Craigsville PSD		General Manager		grcpsd@yahoo.com	
Kris Ward		Craigsville PSD		Operator	(WTP) 304-742-3585	chief.operator@yahoo.com	
Tim Blake	Cra	aigsville Volunteer Fir Department	e	Chief	304-742-5409	cbcvfd3@yahoo.com	
John Miller	Loc	al County Commissio	on	Commissioner	304-742-5553	bowmiller@yahoo.com	
Director	Nich	Nicholas County Emergency Management		Director	304-872-7892	-	
Chris Farrish	WV E	WV DHHR Environmental Engineering Division		District Engineer	304-575-8524	chris.b.farrish@wv.gov	
Larry Marshall	Cr	raigsville Water Board Member -		-	-		
Elizabeth Ratliff	Ni	cholas County Health Department	ו	Sanitarian	304-872-5329	elizabeth.d.ratlifff@wv.gov	
Date of first protection Team Meeting				9/16/15			
Efforts made to inform and engage local stakeholders (public, local government, local emergency planners, local health department,				ville PSD office. All require and Kris Ward via email a ion team for the future reg rly scheduled county com he PSD office. It is estima d to be an effective metho insecutive weeks. The offi	ed members were present for the and telephone, and all agreed to ular updates. mission meeting. The meeting was ited that around 85% of customers d of advertising. A notice was also cial notice of the meeting was sent		
and affected resic and explain abser recommende stakeholders	lents) nce of d ::	There were no representatives from the public present at the meeting, so Kris Ward gave the public presentation to the water board. Attendees were: Joann Flynn, Larry Marshall, Paul Humphries, John Crites, Gary Robinson, Jackie Bailes, Wavelene Ward, and Kris Ward.					



8.0 POTENTIAL SOURCES OF SIGNIFICANT CONTAMINATION

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

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

8.1 CONFIDENTIALITY OF PSSCS

A list of the PSSCs contained within the ZCC should be included in the source water protection plan. However, the exact location, characteristics and approximate quantities of contaminants shall only be 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 Craigsville PSD are identified in the communication planning section of the source water protection plan.

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

8.2 LOCAL AND REGIONAL PSSCS

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

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

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

Table 7. Locally Identified Potential Sources of Significant Contamination

PSSC Number	Map Code	Site Name	Site Description	Relative Risk Score	Comments
32	M-7	Bridge	Bridge crossing the Gauley River approximately 2 miles upstream of the raw water intake.	6.2/14	-



8.3 PRIORITIZATION OF THREATS AND MANAGEMENT STRATEGIES

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

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

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

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

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9.0 IMPLEMENTATION PLAN FOR MANAGEMENT STRATEGIES

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

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

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

Table 8. Priority PSSCs or Critical Areas

PSSC or Critical Area	Priority Number	Reason for Concern
Craigsville PSD Wastewater Treatment Plant	1	The Craigsville PSD wastewater treatment plant is located just upstream of the water treatment plant. If a line break or an accidental release were to occur from the wastewater treatment plant, untreated sewage could contaminate the surface water source, raising concentrations of total coliform, particularly fecal coliform.
Highways and Bridges	2	Rt. 20 runs parallel to the Gauley River just upstream of the intake, and there is a heavily used bridge just under two miles upstream. If an accident were to occur along this road the source water could be impacted and the operators would have very little time to react before the water system became affected.
Future Development and Other Activities Within the Watershed	3	Conditions within the ZCC and larger source water protection area can change from year to year as a result of development and other activities. Understanding the status of various ongoing activities is critical to prevent unforeseen impacts to the Gauley River and its tributaries.
Regular Coordination with Emergency Managers	4	During a water crisis or emergency, it is critical that water system staff have a working relationship with local emergency responders and managers. Responding to an event requires timely and effective coordination of personnel and equipment. Lack of preparation for such an event decreases response times and increases the chance that the entire water system could be impacted.
Yearly Source Water Protection Team Meetings	5	The effectiveness of a Source Water Protection Plan is dependent on its accuracy to real-world conditions. Key personnel, priority PSSCs, and source water conditions are ever-changing, and the Protection Plan must reflect this.

Table 9. Priority PSSC Management Strategies

PSSC or Critical Area	Management Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
Previous Plan Status	There were 7 management strategies recommended in the existing plan. 5 of these strategies have been implemented or are no longer relevant. 2 of the original strategies address ongoing concerns. These are incorporated in this plan update and listed below, along with other source water protection strategies the water utility staff will pursue.	-	-	-	-
Craigsville PSD Wastewater Treatment Plant	The water treatment plant personnel have a history of regular and effective communication with personnel at the wastewater treatment plant. Both facilities are operated by Craigsville PSD and managed by the same staff. In the past, any potential contamination of the Gauley River by the wastewater plant was immediately communicated to the treatment plant operators so they could react accordingly. The treatment plant staff will continue to coordinate with wastewater staff to be alerted if an accidental release were to occur, so that the intake can be shut down while the contamination plume passes. The utility is also considering purchasing a temporary raw water line that could be run upstream of the wastewater plant if there were an emergency. This line could be purchased as part of the upcoming plant expansion if funds are available. Raw water could likely be gravity fed from the upstream location to the plant and a pump would not be required.	Craigsville PSD staff	Regular, ongoing communication	-	No cost association with communication efforts
Highways and Bridges	Nicholas County Office of Emergency Management has conducted a commodity flow study that could be useful in determining what type and how much hazardous material is transported through the ZCC. Craigsville PSD staff will work with Nicholas County OEM to ensure they	Craigsville PSD and OEM staff	By 2019 update	-	Commodity flow study has already been conducted, so cost would be minimal



	are fully prepared to respond to the types of threats they could face with regards to highway traffic.				
Source Water Protection Plan	Update this Source Water Protection Plan at least every 3 years as required by the State Code of West Virginia.	Source Water Protection Team	Every 3 years. Next update in 2019	The Protection Plan should also be updated any time there is a significant change within the protection area or in utility staff. Yearly meetings of the protection team are recommended to ensure all members are up to date and informed about any developments within the protection area.	Minimal costs associated with team members' time
Future Development and Other Activities Within the Watershed	Water utility staff will perform a yearly "windshield survey" of the zone of critical concern. They will note changes in land use, water quality, and other developments that may have occurred since the previous year's survey. These changes will be documented and reflected in future source water protection plan updates.	Water utility staff	Yearly, next survey in 2017	Document the date of the survey and any changes that may have occurred within the ZCC that could impact water quality.	Minimal cost associated with staff time
Regular Coordination with Emergency Managers	Craigsville PSD staff have worked in the past with Nicholas County Emergency Management as well as Craigsville Volunteer Fire Department to respond to emergencies effectively and maintain water service to customers. Representatives from these two groups are active on the Source Water Protection Team. Utility staff will continue to communicate with these emergency services groups on a regular basis, especially when there is not an ongoing emergency. They will meet yearly as part of the Source Water Protection Team.	Water utility staff and emergency personnel	Yearly during regular Protection Team Meetings	-	Minimal cost associated with staff time
Yearly Source Water Protection Team Meetings	The Protection Team for Craigsville PSD will meet on a yearly basis to discuss any changes that might have occurred within the watershed or to find replacements for members who can no longer participate.	Source Water Protection Team	Yearly, next meeting in 2017	-	Minimal cost associated with staff time

10.0 EDUCATION AND OUTREACH STRATEGIES

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



Table 10. Education and Outreach Implementation Plan

Education and Outreach Strategy	Description of Activity	Responsible Protection Team Member	Status/ Schedule	Comments	Estimated Cost
Public Meeting	The utility held an informational meeting with local residents about source water protection efforts. The purpose of the meeting was to increase awareness of the connection between land use and drinking water quality. This meeting fulfilled a required part of the source water protection planning process. No public representatives were present at the public meeting.	Utility Staff	On January 20, 2016	-	Minimal cost associated with staff and public time
Consumer Confidence Report	The water system publishes a Consumer Confidence Report (CCR) annually, as required by the Safe Drinking Water Act, which is sent to all water customers. Information concerning the Source Water Assessment is included in the CCR. In the future, the system will include a reference to this source water protection plan and how customers can access a copy.	PSD operator and staff.	Annually	This would be in addition to required Source Water Assessment information, including source of water and susceptibility to contamination.	CCR required by SDWA, included in annual budget.
Brochures, pamphlets, and letters	Send a letter and/or brochure providing educational information to residences and businesses. These will alert the recipients of the need for source water protection and conservation. Businesses that use greater-than-household quantities of regulated substances may receive a different letter. Several organizations provide information and resources on the internet, related to certain source water concerns and PCSs. The utility will consider obtaining these materials when needed, to educate the community.	PSD operator and staff.	When resources are available.	An example brochure is attached in Appendix E .	Cost in brochure printing and mailing.
School Curricula	Work with the school system to incorporate source water activities into the school curricula. One example of school curricula is Project WET. For more information regarding free workshops to educate area teachers on Project WET, visit <u>http://www.dep.wv.gov/WWE/getinvolved/WET/Pages/default.aspx</u> or contact the WVDEP at 304-926-0495.	PSD operator and staff.	When resources are available	Can provide websites with free education materials to promote source water protection and conservation. Also operator may visit school or invite students for a plant tour to tie in with classroom materials.	Minimal costs. Would require time to coordinate, visit classroom and provide tour.

Drinking Water Protection Signs Erecting Drinking Water Protection Signs along highways is a common awareness strategy in some states and recommended by the USEPA. Signs are placed to alert the public to the SWPA and about what to do in case of accidental spills. The WVDOH has not approved the placement of signs along or adjacent to state highway rights of way for the purposes of source water protection, except for specific sensitive areas.	Utility and City Staff	If needed	If approved, signs will be erected along state highways at no cost to water system. WVDHHR may provide signs or financial support for signs erected on city streets or in public areas.



11.0 CONTINGENCY PLAN

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

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

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

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

11.1 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/). Craigsville PSD has analyzed its ability to effectively respond to emergencies and this information is also provided in **Table 11**.

Table 11. Craigsville PSD Water Shortage Response Capability

Can the utility isolate or divert contamination from the intake or groundwater supply?	Yes
Describe the utility's capability to isolate or divert potential contaminants:	The utility has access to booms if the contaminant was on the surface, which would help to isolate the intake somewhat depending on the type of contaminant they were dealing with. In addition, the operator can shut down the intake pumps to prevent a contaminant from entering the plant.
Can the utility switch to an alternative water source or intake that can supply full capacity at any time?	No

TETRA TECH

Describe in detail the utility's capability to switch to an alternative source:	N/A		
Can the utility close the water intake to prevent contamination from entering the water supply?	Yes		
How long can the intake stay closed?	The intake could stay closed for approximately 28 hours before they were in a critical water shortage situation.		
Describe the process to close the intake:	The operator can shut down the intake pumps to prevent contaminants from entering the plant. This process takes moments and is as simple as manually flipping a few switches.		
	Craigsville PSD does not have any raw water storage.		
	Total treated water storage is around 999,050 gal. (counting the clearwell at the treatment facility)		
	Cottle Tank- 150,000 gal.		
Describe the treated water storage capacity of the	Craigsville Old Tank- 125,000 gal.		
water system:	Craigsville New Tank- 300,000 gal.		
	Mt. Zion Tank- 200,000 gal.		
	Cut Hill Tank- 191,000 gal.		
	Total treated water storage capacity in tanks = 966,000 gal.		
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:	The utility has informal mutual aid agreements with several nearby systems (Summersville, Cowen, and Richwood) for equipment sharing, treatment materials, assistance during emergencies. They have utilized these agreements in the past and have given assistance when needed.		

11.2 OPERATION DURING LOSS OF POWER

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

Table 12. Generator Capacity

What is the type and capacity of the generator needed to operate during a loss of power?	Craigsville PSD would need multiple gen water system during a power outage. The any generators and would rely on ren emergency management services to su	erators to operate the by currently do not own tal companies and pply them. The plant
February 2016	22	TE TETRA TECH

	would require a 300 kW generator to operate at full capa The Cottle Booster Pump requires a 50 kW generator, Craigsville Booster Pump requires a 125 kW generator, a Mt. Zion Booster Pump requires a 35-50 kW generator				to operate at full capacity. s a 50 kW generator, the 125 kW generator, and the a 35-50 kW generator.	
Can the utility connect to generator at intake/wellhead? If yes, select a scenario that best describes system.			No- The raw water intake is powered by the treatment plant so it does not require a generator of its own.			
Can the utility connect to generator at treatment facility? If yes, select a scenario that best describes system.		Yes- The treatment facility is fully wired for a generator that will be rented or borrowed in an emergency.				
Can the utility connec distribution system scenario that best de	t to a generat ? If yes, selec escribes syst	tor in ct a em.	Yes- The booster pump stations are fully wired for a generator that will be rented or borrowed in an emergency.			
Does the utility have hand for the g	adequate fue enerator?	el on	No. The utility has some fuel	storage very lor	e but not enough to operate g.	
			Gallons		Hours	
What is your on-hand fuel storage and how long will it last operating at full capacity?		50-75 gallons of diesel storage on a trailer that can be moved between locations		on 1.5 hours if all generators were operating at once		
			Supplier		Phone Number	
Provide a list of	Generator	Sunt	Supplier	pcm	Phone Number 304-342-5000, 168@sunbeltrentals.com	
Provide a list of suppliers that could provide generators and fuel in the event	Generator Generator	Sunt WV and	Supplier Delt Rentals- Charleston, WV Office of Homeland Security d Emergency Management	pcm	Phone Number 304-342-5000, 1168@sunbeltrentals.com 304-558-5380	
Provide a list of suppliers that could provide generators and fuel in the event of an emergency:	Generator Generator Fuel	Sunt WV and	Supplier Delt Rentals- Charleston, WV Office of Homeland Security d Emergency Management Army National Guard	pcm	Phone Number 304-342-5000, 1168@sunbeltrentals.com 304-558-5380 N/A	
Provide a list of suppliers that could provide generators and fuel in the event of an emergency:	Generator Generator Fuel Fuel	Sunt WV and	Supplier Delt Rentals- Charleston, WV Office of Homeland Security d Emergency Management Army National Guard Craigsville PSD	pcm	Phone Number 304-342-5000, 168@sunbeltrentals.com 304-558-5380 N/A N/A	
Provide a list of suppliers that could provide generators and fuel in the event of an emergency: Does the utility test periodica	Generator Generator Fuel Fuel the generator ally?	Sunk WV and	Supplier Delt Rentals- Charleston, WV Office of Homeland Security d Emergency Management Army National Guard Craigsville PSD	pcm N/A	Phone Number304-342-5000, n168@sunbeltrentals.com304-558-5380N/AN/A	
Provide a list of suppliers that could provide generators and fuel in the event of an emergency: Does the utility test periodication Does the utility routing	Generator Generator Fuel Fuel the generator ally? nely maintain or?	Sunt WV and r(s)	Supplier Delt Rentals- Charleston, WV Office of Homeland Security d Emergency Management Army National Guard Craigsville PSD	pcm N/A N/A	Phone Number 304-342-5000, 168@sunbeltrentals.com 304-558-5380 N/A N/A	

11.3 FUTURE WATER SUPPLY NEEDS

When planning for potential emergencies and developing contingency plans, a utility needs to not only consider their current demands for treated water but also account for likely future needs. This could mean expanding current intake sources or developing new ones in the near future. This can be an expensive and time consuming process, and any water utility should take this into account when determining emergency preparedness. Craigsville PSD 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 Craigsville PSD

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.	The utility is currently in the process of seeking funding for a plant expansion which will allow them to produce 1,296,000 GPD. This upgrade would include improving the intake, sedimentation basin, and filter basins. With this upgrade the utility expects to be able to meet future demands. This opinion is generally supported by population trends projected based on US Census Bureau 2000 and 2010 data. According to the 2005 Interim State Population Projections (1), WV as a whole will see a population decline between 2010 and 2030. In addition, researchers at the WVU College of Business and Economics specifically project that populations within Nicholas County will decrease from a population of 26,233 in 2010 to a projected population of 25,878 in 2020 (2). Census data and projections cannot account for increases in daily demand due to water line extensions. If future water line extension projects are proposed, the daily demands will be reassessed to determine if the source and treatment facilities can support increased demand.
If not, describe the circumstances and plans to increase production capacity:	N/A
(1)US Department of Commerce United State	Census Bureau 2005 Interim State Population Projections Table 1

(1)05 Department of Commerce, Onlied State Census Bureau. 2005 Interim State Population Projections. Table 1.
 <u>http://www.census.gov/population/projections/data/state/projectionsagesex.html</u>. Accessed June 10, 2015.
 (2) Christiadi, Ph.D., Deskins, John, Ph.D., Lego, Brian. WVU College of Business and Economics, Bureau of Business and

Economic Research. March 2014. WVU Research Corporation. <u>http://be.wvu.edu/bber/pdfs/BBER-2014-04.pdf</u> Accessed June 10, 2015.

11.4 WATER LOSS CALCULATION

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

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



be included in the calculation of percentage of water loss for purposes of the source water protection plan. The data in **Table 14** is taken from the most recently submitted Craigsville PSD PSC Annual Report.

Table 14. Water Loss Information

Total Water Pumped (gal)			205,567,000	
Total Water Purchased (gal)			1,000	
Total Water Pumped and Purchased (gal)			205,568,000	
Mains, Plants, Filters, Flushing, etc.		0		
Water Loss Accounted for Except Main Leaks	Fire Department		120,000	
(gal)	Back Washing		0	
	Blowing Settling Basins		0	
Total Water Loss Ac	Total Water Loss Accounted For Except Main Leaks			
Water Sold- Total Gallons (gal)			117,142,000	
Unaccounte	ed For Lost Water (gal)		75,674,000	
Water lost	from main leaks (gal)		12,632,000	
Total gallons of Unaccou from	inted for Lost Water and Wa Main Leaks (gal)	ater Lost	88,306,000	
Total Percent Unaccounted For Water and Water Lost from Main Leaks (gal)			42.96%	
If total percentage of Unaccounted for Water is greater than 15%, please describe any measures that could be taken to correct this problem:		PSD currently has a leak detection and n program and they have contacted a tant to perform a more in depth leak detection survey.		

*This information was taken from the 2014 Public Service Commission Annual Report for Craigsville PSD

11.5 EARLY WARNING MONITORING SYSTEM

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

When establishing a continuous monitoring system, the utility should consider the logistics of placing and maintaining the equipment, and receiving output data from the equipment.

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

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

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

Yes. The utility has received notices and alerts from Does your system currently receive spill the Craigsville PSD wastewater treatment plant, notifications from a state agency, neighboring which is just upstream of the plant. They would also water system, local emergency responders, or receive notices from Adkins Oil and the Town of other facilities? If yes, from whom do you receive Camden on Gauley, both of which lie upstream of the notices? treatment facility. Yes. The primary contamination threats to the water Are you aware of any facilities, land uses, or treatment plant are active and abandoned mine lands critical areas within your protection areas where within the Zone of Critical Concern, as well as chemical contaminants could be released or Craigsville Wastewater Treatment Plant, which is just spilled? upstream. Yes. If notified of a spill or contamination event, the operators would collect raw water grab samples from Are you prepared to detect potential the Gauley River at or upstream of the raw water contaminants if notified of a spill? intake. Laboratories Name Contact List laboratories (and contact 800-999-0105. 304-255-2500. information) on whom you **REIC Laboratory- Beaver, WV** info@reiclabs.com would rely to analyze water samples in case of a reported 1-800-880-6406, spill. Analabs- Crab Orchard, WV analabs@analabsinc.com WV State Laboratory, Environmental 304-965-2694 Chemistry Section- Charleston, WV

Table 15. Early Warning Monitoring System Capabilities



Do you have an understanding of baseline or normal conditions for your source water quality that accounts for seasonal fluctuations?			Yes-The operators have determined baseline water conditions through daily sampling in the plant and by monitoring the typical chemical feeds that are required to treat the water day to day.		
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?			No. See Form B in Appendix B .		
Provide or estimate the	Monitoring System	YSI EXO 2 (B-1)		Hach sc1000 (B-2)	Real Tech Full Scanning Monitoring System (B-3)
capital and O&M costs for your current or	Capital	Approximate Capital Cost- \$19,000		Approximate Capital Cost- \$18,907	Approximate Capital Cost- \$24,155
proposed early warning system or upgraded system.	Yearly O & M	Parts and calibration- Approximately \$1,000 Data management and telemetry- \$1,000		Full service contract with Hach Service Representative- \$2,258 Online Viewer-\$600	Replacement Lamps- \$1,480 Smart-Sense Monitoring Service- \$499
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		

12.0 SINGLE SOURCE FEASIBILITY STUDY

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

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



13.0 COMMUNICATION PLAN

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

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

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

The West Virginia Department of Environmental Protection is capable of providing expertise and assistance related to prevention, containment, and clean-up of chemical spills. The West Virginia Department of Environmental Protection Emergency Response 24-hour Phone is 1-800-642-3074. The West Virginia Department of Environmental Protection also operates an upstream distance estimator that can be used to determine the distance from a spill site to the closest public water supply surface water intake.
14.0 EMERGENCY RESPONSE 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 source water protection plan, such as the contingency planning and communication plan, may contain similar information to the utility's emergency response plan. However, the emergency response plan is to be kept confidential and is not included in this source water protection plan. An Emergency Short Form is included in **Appendix C** to support the Communicate Plan by providing quick access to important information about emergency response and are to be used for internal review and planning purposes only.



15.0 CONCLUSION

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

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

APPENDIX A. FIGURES







Legend

- * Oil/Gas Wells
- ✦ USEPA Regulated Sites
- Mining Outlets
- Bond Forfeiture Sites
- OWRNPDES Outlets
- OWRNPDES Permits
- Leaking Underground Storage Tanks
- ---- Mine Highwalls

Field Verified PSSCs

- Agriculture
- Commercial
- Industrial
- Municipal
- Residential
 - Coal Impoundments
 - Zone of Critical Concern
 - Zone of Peripheral Concern
 - Watershed Delineation Area









Craigsville PS PWSID: WV3303 Source Water Protect

Priority Locally Identified PSSCs (SWAP_PCS) – Figure A-3

PSSC Number	Map Code	Site Name	Site Description	Comments
1	M-20	WVDOH salt pile	Road maintenance depots/deicing operations	Location provided by operator.
2	C-10	Construction Area	Construction areas	Bridge construction complete. New bridge dedicated in 2001 according to sign.
3	C-23	Very old building recently used as a residence, now unoccupied.	Historic gas stations	none
4	C-25	Abandoned vehicles around a residence, not a commercial junkyard	Junk yards, scrap and auto	none
5	M-29	Craigsville PSD Waste Water Treatment Plant	Wastewater Treatment Plant	none
6	M-7	Route 20. Busy 2-lane paved highway.	Highway	none
7	C-23	Empty lot behind Bethel Methodist Church. Historic gas station structure not found	Historic gas stations	none
8	C-23	Cinder block building with caved-in roof between Route 20 and small creek. Illegal dump site with trash, deer carcasses, and old tires.	Historic gas stations	none
9	I-23	Abandoned Mine Lands	Mines: abandoned	Not Surveyed, Not Accessible. Older mine lands mostly revegetated
10	C-18	No gas stations open for business in Camden on Gauley.	Gas Stations	Surveyed, Not Found
11	I-23	Abandoned Mine Lands	Mines: abandoned	Not Surveyed, Not Accessible
12	C-18	Adkins Oil Inc. gas station, auto parts store, 4 service bays, one above ground fuel tank, refuse and old tires piled behind buildings	Gas Stations	none
13	I-23	Abandoned Mine Lands	Mines: abandoned	Not Surveyed, Not Accessible. Mine lands mostly revegetated with some dirt haul roads
14	C-25	Junkyard	Junk yards, scrap and auto	Trash and abandoned vehicles around trailer homes along road leading to site. Not Surveyed, Not Accessible. Site on bad road behind residence with Confederate flag and hand-painted keep out sign.
15	C-9	Blacks Chapel Cemetery	Cemeteries	none
16	A-18	Horse pasture in Strouds Creek floodplain	Pasture*	none
17	C-31	Camden on Gauley Medical Center and pharmacy, walking track behind medical building	Medical/dental offices/clinics	none

Craigsville PSD

18	I-21	Gauley Mills Coal Prep Area	Material stockpiles (coal, metallic ores, phosph.	In Gauley Mills, abandoned coal prep or loading area with metal roof, conveyor belts, machinery, and above ground tanks.
19	A-18	Horse pasture beside tributary creek across from Gauley Mills Baptist Church.	Pasture*	none
20	C-25	Junk Yard - Closed	Junk yards, scrap and auto	none
21	I-23	Reclaimed Coal Mine Lagoon 3	Mines: abandoned	PCS not surveyed, inaccessible
22	M-29	4-H Camp Caesar sewage treatment ponds adjacent to plant backwash pond	Wastewater Treatment Plant	none
23	I-23	Reclaimed Coal Mine Lagoon 1, removed	Mines: abandoned	PCS not surveyed, inaccessible
24	C-23	Gas station is gone. Owner says site it clean. Planned use is propane sales.	Historic gas stations	none
25	C-10	site of future WVDOH regional headquarters and garage	Construction areas	Location identified through regulatory database and confirmed by the operators.
26	I-44	SPRING RIDGE COAL COMPANY	Other	
27	I-23	Reclaimed Coal Mine Abandoned mine 2	Mines: abandoned	PCS not surveyed, inaccessible
28	I-23	Reclaimed Coal Mine Abandoned mine 1	Mines: abandoned	PCS not surveyed, inaccessible
29	I-23	Reclaimed Coal Mine Abandoned mine 3	Mines: abandoned	PCS not surveyed, inaccessible
30	I-23	Reclaimed Coal Mine Lagoon 2	Mines: abandoned	PCS not surveyed, inaccessible
31	C-1	Propane tank storage lot	Above Ground Storage Tanks	none
32	M-7	Bridge	Bridge crosses the Gauley River just upstream of the raw water intake	none

*Only 32 high priority field-verified PSSCs are shown.10 more field-verified points lie within the watershed but were not prioritized in this analysis.



Craigsville PSD -PSSC Summary

PSSC Layer	Total
Above Ground Storage Tanks (AST_Unique)	12
Mining Outlets (HPU)	89
NPDES Permits (OWRNPDES)	23
Bond Forfeiture (SPREC)	4
USEPA Regulated Sites (Superfund_RCRA)	26
Oil/Gas Wells (ERIS_Wells)	11

Above Ground Storage Tanks (AST_Unique) - Figure A-7

Map ID	Regulation Type	Permit Number	Site Description	Year Constructed	Capacity (gal)	Comments
R-1	AST Unique	034-00000022	L ADKINS OIL	2010		L ADKINS OIL INC
R-2	AST Unique	051-00000002	Cowen public service district	2005		COWEN PSD
R-3	AST Unique	051-00000003	Cowen public service district	1987		COWEN PSD
R-4	AST Unique	051-00000004	Cowen public service district	2002		COWEN PSD
R-5	AST Unique	051-00000005	Cowen public service district	1985		COWEN PSD
R-6	AST Unique	051-00000006	Cowen public service district	1968		COWEN PSD
R-7	AST Unique	051-00000081	Leslie Equipment Co.	2009		LESLIE EQUIPMENT CO
R-8	AST Unique	051-00000161	Webster County High School	2004		WEBSTER COUNTY BOARD OF EDUCATION
R-9	AST Unique	051-00000166	WVDOH Cowen Substation	2005		WVDOH-EQUIPMENT DIVISION
R-10	AST Unique	051-00000167	ALLEGHENY WOOD PRODUCTS COWEN	2005		WOODFORD OIL COMPANY
R-11	AST Unique	034-00000196	Craigsville Public Service District Water Plant	1997		CRAIGSVILLE PSD
R-12	AST Unique	034-00000203	Craigsville Public Service District Water Plant	1962		CRAIGSVILLE PSD

*Only 12 high priority PSSCs are shown and numbered. 3 more points lie within the watershed but were not prioritized in this analysis or were duplicate points. Tanks were prioritized by proximity to the ZCC and raw water intake. Unless they were very old or very large, only tanks within or around the ZPC and ZCC were prioritized and labeled.

Responsible Party Count-HPU Mining Outlets

Responsible Party	Outlets Count
C C CONLEY & SONS INC	17
COAL CORP OF AMERICA INC	2
DELTA COAL SALES, INC	2
DELTA MINING, INC	1
DIAMOND DRILLING INC.	1
ELK RIVER SEWELL COAL CO	16
GAULEY EAGLE HOLDINGS INC	7
HOPE COAL CO	1
ICG EASTERN, LLC	8
ISLAND CREEK COAL COMPANY	1
K & B COAL CO	22
LIONEL COAL CO	8
NEW LAND LEASING COMPANY INC	41
PEERLESS EAGLE COAL CO	1
SPRING RIDGE COAL CO	14

Mining Outlets (HPU) – Figure A-5

Map ID	Regulation Type	Permit Number	Site Description	Туре
R-13	HPU	WV0032115	GAULEY EAGLE HOLDINGS INC	STRM
R-14	HPU	WV0032115	GAULEY EAGLE HOLDINGS INC	STRM
R-15	HPU	WV0068501	NEW LAND LEASING COMPANY INC	OUTLT
R-16	HPU	WV0068501	NEW LAND LEASING COMPANY INC	OUTLT
R-17	HPU	WV0068501	NEW LAND LEASING COMPANY INC	OUTLT
R-18	HPU	WV0068501	NEW LAND LEASING COMPANY INC	OUTLT
R-19	HPU	WV0068501	NEW LAND LEASING COMPANY INC	OUTLT
R-20	HPU	WV0068560	NEW LAND LEASING COMPANY INC	OUTLT
R-21	HPU	WV0090328	COAL CORP OF AMERICA INC	OUTLT



Map ID	Regulation Type	Permit Number	Site Description	Туре
R-22	HPU	WV0090328	COAL CORP OF AMERICA INC	OUTLT
R-23	HPU	WV0097811	K & B COAL CO	OUTLT
R-24	HPU	WV0097811	K & B COAL CO	OUTLT
R-25	HPU	WV0098400	LIONEL COAL CO	STRM
R-26	HPU	WV0098400	LIONEL COAL CO	STRM
R-27	HPU	WV0098400	LIONEL COAL CO	OUTLT
R-28	HPU	WV0098400	LIONEL COAL CO	OUTLT
R-29	HPU	WV0098400	LIONEL COAL CO	OUTLT
R-30	HPU	WV0098400	LIONEL COAL CO	OUTLT
R-31	HPU	WV0098400	LIONEL COAL CO	OUTLT
R-32	HPU	WV0098400	LIONEL COAL CO	OUTLT
R-33	HPU	WV1001931	NEW LAND LEASING COMPANY INC	OUTLT
R-34	HPU	WV1001931	NEW LAND LEASING COMPANY INC	OUTLT
R-35	HPU	WV1001931	NEW LAND LEASING COMPANY INC	OUTLT
R-36	HPU	WV1001931	NEW LAND LEASING COMPANY INC	OUTLT
R-37	HPU	WV1001931	NEW LAND LEASING COMPANY INC	OUTLT
R-38	HPU	WV1001931	NEW LAND LEASING COMPANY INC	OUTLT
R-39	HPU	WV1001931	NEW LAND LEASING COMPANY INC	OUTLT
R-40	HPU	WV1001931	NEW LAND LEASING COMPANY INC	OUTLT
R-41	HPU	WV1001931	NEW LAND LEASING COMPANY INC	OUTLT
R-42	HPU	WV1001931	NEW LAND LEASING COMPANY INC	OUTLT
R-43	HPU	WV1001931	NEW LAND LEASING COMPANY INC	OUTLT
R-44	HPU	WV1002414	DIAMOND DRILLING INC.	OUTLT
R-45	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-46	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-47	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-48	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-49	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-50	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-51	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT



Map ID	Regulation Type	Permit Number	Site Description	Туре
R-52	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-53	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-54	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-55	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-56	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-57	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-58	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-59	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-60	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-61	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-62	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-63	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-64	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-65	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-66	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-67	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-68	HPU	WV1010352	NEW LAND LEASING COMPANY INC	OUTLT
R-69	HPU	WV1013629	K & B COAL CO	OUTLT
R-70	HPU	WV1013629	K & B COAL CO	OUTLT
R-71	HPU	WV1013629	K & B COAL CO	OUTLT
R-72	HPU	WV1013629	K & B COAL CO	OUTLT
R-73	HPU	WV1013629	K & B COAL CO	OUTLT
R-74	HPU	WV1013629	K & B COAL CO	OUTLT
R-75	HPU	WV1013629	K & B COAL CO	OUTLT
R-76	HPU	WV1013629	K & B COAL CO	OUTLT
R-77	HPU	WV1013629	K & B COAL CO	OUTLT
R-78	HPU	WV1013629	K & B COAL CO	OUTLT
R-79	HPU	WV1013629	K & B COAL CO	OUTLT
R-80	HPU	WV1013629	K & B COAL CO	OUTLT
R-81	HPU	WV1013629	K & B COAL CO	OUTLT



-				
Map ID	Regulation Type	Permit Number	Site Description	Туре
R-82	HPU	WV1013629	K & B COAL CO	OUTLT
R-83	HPU	WV1013629	K & B COAL CO	OUTLT
R-84	HPU	WV1013629	K & B COAL CO	OUTLT
R-85	HPU	WV1013629	K & B COAL CO	OUTLT
R-86	HPU	WV1013629	K & B COAL CO	OUTLT
R-87	HPU	WV1013629	K & B COAL CO	OUTLT
R-88	HPU	WV1013629	K & B COAL CO	OUTLT
R-89	HPU	WV1014536	GAULEY EAGLE HOLDINGS INC	STRM
R-90	HPU	WV1014536	GAULEY EAGLE HOLDINGS INC	STRM
R-91	HPU	WV1014536	GAULEY EAGLE HOLDINGS INC	OUTLT
R-92	HPU	WV1014536	GAULEY EAGLE HOLDINGS INC	OUTLT
R-93	HPU	WV1014536	GAULEY EAGLE HOLDINGS INC	OUTLT
R-94	HPU	WV1025716	ICG EASTERN, LLC	OUTLT
R-95	HPU	WV1025716	ICG EASTERN, LLC	OUTLT
R-96	HPU	WV1025716	ICG EASTERN, LLC	OUTLT
R-97	HPU	WV1025716	ICG EASTERN, LLC	OUTLT
R-98	HPU	WV1025716	ICG EASTERN, LLC	STRM
R-99	HPU	WV1025716	ICG EASTERN, LLC	STRM
R-100	HPU	WV1025716	ICG EASTERN, LLC	STRM
R-101	HPU	WV1025716	ICG EASTERN, LLC	STRM

*89 priority permitted sites are labeled near the ZCC or ZPC, but there are 53 other permitted sites in the WSDA. Many of these sites may be under the same permit number, so the number of actual mining sites is less than the number of permitted sites.

NPDES Permits (OWRNPDES_Permits) – Figure A-6

Map ID	Regulation Type	Permit Number	Site Description	Comments
R-102	OWRNPDES	025474	NA	N/A
R-103	OWRNPDES	026366	NA	N/A
R-104	OWRNPDES	030953	NA	N/A



Craigsville PSD

Map ID	Regulation Type	Permit Number	Site Description	Comments
R-105	OWRNPDES	035977	NA	N/A
R-106	OWRNPDES	039186	NA	N/A
R-107	OWRNPDES	046423	NA	N/A
R-108	OWRNPDES	029542	NA	N/A
R-109	OWRNPDES	041727	NA	N/A
R-110	OWRNPDES	041996	NA	N/A
R-111	OWRNPDES	WVG413422	Joseph L & Constance L Hill	UNT/BIG DITCH RN/GAULEY RV/KANAWHA RV
R-112	OWRNPDES	WVR105851	WATER DISTRIBUTION SYSTEM IMPROVEMENTS PROJECT	Gauley R/ Kanawha R
R-113	OWRNPDES	050297	NA	N/A
R-114	OWRNPDES	025112	NA	N/A
R-115	OWRNPDES	035995	NA	N/A
R-116	OWRNPDES	037570	NA	N/A
R-117	OWRNPDES	040206	NA	N/A
R-118	OWRNPDES	042757	NA	N/A
R-119	OWRNPDES	045636	NA	N/A
R-120	OWRNPDES	022365	NA	N/A
R-121	OWRNPDES	028117	NA	N/A
R-122	OWRNPDES	039056	NA	N/A
R-123	OWRNPDES	042754	NA	N/A
R-124	OWRNPDES	WV0024961	CAMDEN ON GAULEY TOWN OF	Gauley River/Kanawha River
R-125	OWRNPDES	026365	NA	N/A
R-126	OWRNPDES	026870	NA	N/A
R-127	OWRNPDES	028112	NA	N/A
R-128	OWRNPDES	030705	NA	N/A
R-129	OWRNPDES	030706	NA	N/A
R-130	OWRNPDES	035979	NA	N/A
R-131	OWRNPDES	040393	NA	N/A
R-132	OWRNPDES	042756	NA	N/A
R-133	OWRNPDES	048592	NA	N/A
R-134	OWRNPDES	048593	NA	N/A

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Map ID	Regulation Type	Permit Number	Site Description Comments	
R-135	OWRNPDES	WV0045730	CRAIGSVILLE PSD	GAULEY RIVER
R-136	OWRNPDES	WVG611549	Leslie Equipment company	Price Glade Run/Gauley River/Kanawha River
R-137	OWRNPDES	050292	NA	N/A
R-138	OWRNPDES	034012	NA	N/A
R-139	OWRNPDES	036694	NA	N/A
R-140	OWRNPDES	041728	NA	N/A
R-141	OWRNPDES	046425	NA	N/A
R-142	OWRNPDES	WVG610577	DRY KILN	PRICE GLAD RUN/Gauley River/Kanawha River
R-143	OWRNPDES	043987	NA	N/A
R-144	OWRNPDES	046744	NA	N/A
R-145	OWRNPDES	047226	NA	N/A
R-146	OWRNPDES	WV0037397	COWEN PSD	Unnamed Tributary/Big Ditch Run/Gauley River/Kanawha River/Ohio River
R-147	OWRNPDES	WVG610576	Allegheny Wood Products, Inc.	PRICE GLADE RUN/Gauley River/Kanawha River
R-148	OWRNPDES	022735	NA	N/A
R-149	OWRNPDES	034919	NA	N/A
R-150	OWRNPDES	043483	NA	N/A
R-151	OWRNPDES	046513	NA	N/A
R-152	OWRNPDES	WVG980123	COWEN SUBSTATION	UNT/Price Glade Run/Gauley Rv/Kanawha Rv
R-153	OWRNPDES	WVR105810	Cowen Public Service District Upper Glade Phase 1	Long Glade Ditch/ Big Ditch Rn/ Gauley R/ Kanawha R
R-154	OWRNPDES	WVR105913	COWEN PUBLIC SERVICE DISTRICT WATER SYSTEM REHABILITATION PROJECT	Big Ditch Rn/ Gauley R/ Kanawha R
R-155	OWRNPDES	WVG550913	WV Baptist Camp at Cowen	GAULEY RV/KANAWHA RV
R-156	OWRNPDES	030945	NA	N/A
R-157	OWRNPDES	042187	NA	N/A
R-158	OWRNPDES	042961	NA	N/A
R-159	OWRNPDES	035986	NA	N/A
R-160	OWRNPDES	028660	NA	N/A
R-161	OWRNPDES	046741	NA	N/A
R-162	OWRNPDES	025472	NA	N/A



Craigsville PSD

Map ID	Regulation Type	Permit Number	Site Description	Comments
R-163	OWRNPDES	031765	NA	N/A

*Only 61 priority PSSCs are shown and numbered. 74 more points lie within the watershed but are not shown.

NPDES Outlets (OWRNPDES_Outlets) – Figure A-6

Map ID	Regulation Type	Permit Number	Site Description	Comments
R-164	OWRNPDES OUTLETS	WVG550913	WV Baptist Camp at Cowen	GAULEY RV/KANAWHA RV
R-165	OWRNPDES OUTLETS	WVG413422	Joseph L & Constance L Hill	UNT/BIG DITCH RN/GAULEY RV/KANAWHA RV
R-166	OWRNPDES OUTLETS	WVG414550	Phyllis McHenry	NATURAL DRAINAGE/UNT/PRICE GLADE RN RM 0.82/GAULEY RV/KANAWHA RV
R-167	OWRNPDES OUTLETS	WV0045730	CRAIGSVILLE PSD	Gauley
R-168	OWRNPDES OUTLETS	WV0045730	CRAIGSVILLE PSD	NA
R-169	OWRNPDES OUTLETS	WV0045730	CRAIGSVILLE PSD	Gauley
R-170	OWRNPDES OUTLETS	WV0045730	CRAIGSVILLE PSD	Gauley
R-171	OWRNPDES OUTLETS	WV0045730	CRAIGSVILLE PSD	Gauley
R-172	OWRNPDES OUTLETS	WV0045730	CRAIGSVILLE PSD	Gauley
R-173	OWRNPDES OUTLETS	WV0045730	CRAIGSVILLE PSD	Gauley
R-174	OWRNPDES OUTLETS	WV0045730	CRAIGSVILLE PSD	NA
R-175	OWRNPDES OUTLETS	WVG611549	Leslie Equipment company	NA
R-176	OWRNPDES OUTLETS	WVG640028	Cowen PSD Water Plant	GAULEY RV/KANAWHA RV
R-177	OWRNPDES OUTLETS	WVG610577	DRY KILN	NA
R-178	OWRNPDES OUTLETS	WVG610577	DRY KILN	NA
R-179	OWRNPDES OUTLETS	WVG610577	DRY KILN	NA
R-180	OWRNPDES OUTLETS	WVG870001	BLACK FLY/GYPSY MOTH PROGRAMS	Gauley River
R-181	OWRNPDES OUTLETS	WV0037397	COWEN PSD	Long Glade Creek/Big Ditch Run/Gauley River/Kanawha River/Ohio River
R-182	OWRNPDES OUTLETS	WV0037397	COWEN PSD	Gauley River/Kanawha River/Ohio River
R-183	OWRNPDES OUTLETS	WV0037397	COWEN PSD	NA
R-184	OWRNPDES OUTLETS	WV0037397	COWEN PSD	Long Glade Creek/Big Ditch Run/Gauley River
R-185	OWRNPDES OUTLETS	WVG610576	Allegheny Wood Products, Inc.	NA
R-186	OWRNPDES OUTLETS	WVG980123	COWEN SUBSTATION	UNT/Price Glade Run/Gauley Rv/Kanawha Rv



Map ID	Regulation Type	Permit Number	Site Description	Comments
R-187	OWRNPDES OUTLETS	WVG980123	COWEN SUBSTATION	UNT/Price Glade Run/Gauley Rv/Kanawha Rv
R-188	OWRNPDES OUTLETS	WVG980123	COWEN SUBSTATION	UNT/Price Glade Run/Gauley Rv/Kanawha Rv

*Only 24 priority PSSCs are shown and numbered. 2 more point lies within the watershed but is not shown.

Special Reclamation-Bond Forfeiture Sites (SPREC) - Figure A-6

Map ID	Regulation Type	Permit Number	Site Description	Comments
R-189	SPREC	S-3010-86	K & B COAL CO.	Revoked 10/22/93. Must rework VF and eliminate coal piles. Bid 5/17/94.Pioneer started regrading 9/94. Coal stockpile regraded. ND 5-23-95. Regarding eliminated water quality problem. Removed from priority list 8/17/95. Part of permit in Nicholas County.
R-190	SPREC	P-1023-91	K & B COAL CO.	Core drilling only on pre-existing roads. No water on site. To be reclaimed in conjunction with S-2006-92.
R-191	SPREC	P-134-83	JAMES H. ADKINS & SONS, INC.	UPDATED AMD STATUS 1-19-01. Site is being developed for housing - No previous AMD
R-192	SPREC	S-2006-92	K & B COAL CO.	Revoked 10/22/93. Initial visit revealed good WQ except for pit which exhibited mildly depressed pH and moderate conductivity. Part of permit in Nicholas County.

*Only4 priority PSSCs are shown and numbered. 12 more points lie within the watershed but are not shown

USEPA Regulated Sites (Superfund_RCRA) – Figure A-6

Map ID	Regulation Type	Permit Number	Site Description	Comments
R-193	Superfund RCRA Facilities	110005572601	BILLS BODY SHOP	
R-194	Superfund RCRA Facilities	110005574324	LESLIE EQUIPMENT COMPANY	
R-195	Superfund RCRA Facilities	110006832534	LESLIE EQUIPMENT CO - SITE 2	
R-196	Superfund RCRA Facilities	110007334116	JULIANA MINING COMPANY, INC.	
R-197	Superfund RCRA Facilities	110009117810	CAMDEN ON GAULEY TOWN OF	
R-198	Superfund RCRA Facilities	110010851989	COWEN PSD	
R-199	Superfund RCRA Facilities	110010864644	CRAIGSVILLE PSD	



Map ID	Regulation Type	Permit Number	Site Description	Comments
R-200	Superfund RCRA Facilities	110010869079	COWEN PSD WATER PLANT	
R-201	Superfund RCRA Facilities	110010878158	WV BAPTIST CAMP AT COWEN	
R-202	Superfund RCRA Facilities	110015630548	GLADE ELEMENTARY SCHOOL	
R-203	Superfund RCRA Facilities	110016674286	BIRCH RIVER ELEMENTARY	
R-204	Superfund RCRA Facilities	110030915160	GLADE MIDDLE SCHOOL	
R-205	Superfund RCRA Facilities	110039953379	CRAIGSVILLE WWTP	
R-206	Superfund RCRA Facilities	110040715875	MARY'S GROCERY - ID# 5-105735	
R-207	Superfund RCRA Facilities	110045294169	COWEN PUBLIC SERVICE DISTRICT	
R-208	Superfund RCRA Facilities	110046123645	ALLEGHENY WOOD PRDS SAWMILL & DRY KILN	
R-209	Superfund RCRA Facilities	110046124485	WATER DISTRIBUTION SYSTEM IMPR	
R-210	Superfund RCRA Facilities	110046125563	WV BROADBAND GRANT #2672 WEBST	
R-211	Superfund RCRA Facilities	110046143785	COWEN PUBLIC SERVICE DISTRICT	
R-212	Superfund RCRA Facilities	110054877086	B & B SERVICE CENTER	
R-213	Superfund RCRA Facilities	110054897224	COWEN PSD	
R-214	Superfund RCRA Facilities	110054932695	WEBSTER CO. BUS. PARK INDUSTRI	
R-215	Superfund RCRA Facilities	110054950059	CAMDEN WATER EXTENSION	
R-216	Superfund RCRA Facilities	110054953127	WEBSTER COUNTY BUSINESS PARK	
R-217	Superfund RCRA Facilities	110054978155	LARRY R THOMPSON LUMBER CO INC	
R-218	Superfund RCRA Facilities	110055010839	CRAIGSVILLE SANITARY SEWER SYS	
R-219	Superfund RCRA Facilities	110055015102	GRASSY RUN BRIDGE S334-20-33.6	

*Only 26 high priority PSSCs are shown and numbered. 11 more registered points lie within the watershed but were not prioritized in this analysis.

Oil and Gas Wells	(ERIS_Wells) – Figure A-5
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Map ID	Regulation Type	Permit Number	Site Description	Farm Name	Marcellus
R-220	ERIS Wells	10100007	OPERATOR UNKNOWN	WILLIAMS, C. B.	No
R-221	ERIS Wells	10100014	OPERATOR UNKNOWN	ARBOGAST, H. E.	No
R-222	ERIS Wells	10100021	OPERATOR UNKNOWN	LUCKY-CARPENTER	No
R-223	ERIS Wells	10100029	OPERATOR UNKNOWN	MILLER, GEORGE W.	No
R-224	ERIS Wells	10100040	OPERATOR UNKNOWN	BERTHY, J. N. JR.	No



R-225	ERIS Wells	10100017	OPERATOR UNKNOWN	THOMAS, A. C. & OLIVE	No
R-226	ERIS Wells	10100013	OPERATOR UNKNOWN	HOWARD, C. D HEIRS	No
R-227	ERIS Wells	10100041	OPERATOR UNKNOWN	HOWARD, H. F.	No
R-228	ERIS Wells	10100031	OPERATOR UNKNOWN	WOODS, BONNIE J.	No
R-229	ERIS Wells	10100036	OPERATOR UNKNOWN	THOMAS, AGATHA	No
R-230	ERIS Wells	10100009	OPERATOR UNKNOWN	DODRILL, CLARA	No
R-231	ERIS Wells	10100035	OPERATOR UNKNOWN	ARTHUR & HOLCOMB	No

*Only 11 high priority PSSCs are shown and numbered. 7 more registered points lie within the watershed but were not prioritized in this analysis.



APPENDIX B. EARLY WARNING MONITORING SYSTEM FORMS

Form B- Proposed Early Warning Monitoring Systems

Craigsville PSD

Primary Surface Water Source:

There are many possible solutions for designing and installing an early warning monitoring system. Over time, this technology changes and improves and it is difficult to determine the type of equipment that will be useful and effective in the long term. This plan is a proposed system that would work for Craigsville PSD using current technology and the current plant and intake configuration.

The primary water source for Craigsville PSD is the Gauley River, and the raw water intake is located approximately 200' away from the treatment plant.

B-1. YSI EXO 2 Monitoring System Proposal Describe the type of early warning detection equipment that could be installed, including the design.

The YSI EXO 2 Multiport Sonde, which can accommodate 6 different sensors and has an automatic wiper mechanism to remove biofouling from the sensor tips, which reduces maintenance time. The sonde is built to be resilient and low maintenance, and is capable of providing online water quality monitoring that can be transmitted real time to a designated PC or website that can be accessed by any designated user.

The sonde can hold up to 6 sensors, but this plan recommends 4 of the more basic sensors that would be sufficient to detect any sudden shifts in water quality in any West Virginia stream or river. These sensors would include: conductivity/temperature, optical dissolved oxygen, pH, and fluorescent dissolved organic matter (fDOM). The fDOM sensor could potentially detect petroleum products in the water but is not entirely reliable for this purpose. At this time, YSI does not make a sensor for petroleum products for the EXO 2 but likely will in the future, at which time it is recommended that the utility purchase it. Other sensors could be purchased in the future as well if deemed necessary by the utility.

Where would the equipment be located?

The sonde would be attached to the intake pipe itself, which extends into the Gauley River. This would provide a stable foundation for the equipment and also ensure that the device is able to sample the water that is actually entering the intake pipe and not missing potential contaminants because it is located on the wrong side of the stream or too far from the intake. The suggested method of mounting the sonde involves drilling holes in a PVC pipe, capping the end, inserting the sonde and attaching to the intake pipe structure using brackets or chains. This will protect the sensor from debris and hide it from view somewhat.

The sonde would be hardwired to the YSI Storm 3 data analysis/telemetry system. Since the Craigsville PSD water treatment plant is so close to the intake, the Storm 3 could be located in the plant itself. If this was not possible and it needed to be located on the bank closer to the intake, the unit is contained in a waterproof case that could be located in the structure that currently houses the raw water pumps. The YSI system comes equipped with a solar photovoltaic panel capable of powering both the data analysis unit and the sonde, so



long as the sonde is hardwired to the Storm 3. The device can be battery powered as well if this is not an option.

What would the maintenance plan for the monitoring equipment entail?

The maintenance plan for the system would involve replacing the dissolved oxygen sensor cap, replacing the pH electrode cap, and purchasing pH, turbidity, and conductivity calibration solution on a yearly basis. The sonde itself is designed to last from 5-10 years and should be inspected and calibrated once a month.

In addition, there is a recurring yearly fee associated with the real-time data/telemetry package for managing the website and data analysis.

Describe the proposed sampling plan at the monitoring site.

The sonde can be programmed to take regular measurements at any intervals defined by the operator or user. These measurements can also be taken in bursts, averaged over a period of time, or modified automatically as water quality levels change. Data is stored in the Storm 3 and transmitted to the plant computer as it is recorded. This information can be transmitted wirelessly via a cellular modem. The cellular transmitter is powerful enough to work even in areas with poor cell reception.

Describe the proposed procedures for data management and analysis.

The Storm 3 package includes data management software that can generate data reports and presentations and allow the user to modify and adjust sampling schedules remotely from the plant.

The sonde can be programmed to alert the user when any of the water quality parameters exceeds a userdefined level. This will allow the operator to program the system to notify them when their previously observed baseline conditions are exceeded in time for them to shut down the pumps and close off the intake. The operator can receive alerts via text message and email at the treatment plant computer or any designated cell phone.

B-2. Hach sc1000 Monitoring System Proposal

Describe the type of early warning detection equipment that could be installed, including the design.

The Hach sc1000 online monitoring system includes a controller, back panel, display module, and trough. Raw water is pumped into the trough from the source where it can be sampled in real time. The probe module can accommodate up to 6 sensors, which means it can monitor up to 6 parameters at once. This plan suggests the following sensors: conductivity, pH, turbidity, and dissolved oxygen. Hach can also supply a sensor to detect oil in water, which would cost an additional \$18,414.00 and would be a good investment for any water system if sufficient funds were available. This sensor is not included in the quoted capital cost. There are several other probes for other parameters that are available from Hach, and these could be purchased as deemed necessary by the utility.

Where would the equipment be located?

The sc1000 Controller, back panel, and trough could be located in the plant itself. A small diameter line would run out from the plant the length of the intake pipe to pull raw water back to the controller where it would flow



into the trough for sampling. The closer this sampling line can be to the actual intake, the more accurately it will reflect the raw water that is actually entering the plant. This option would require the utility to purchase a line or hose long enough to reach the intake pipe and a small pump. The line and pump could be fairly low-tech and inexpensive, as the sc1000 only requires a minimum of 900 mL/min. of flow.

The controller will be equipped with the MODBUS advanced communications/networking unit, which can transmit readings in real time directly to the SCADA system in the treatment plant to alert the operators in any change in baseline water quality. The sc1000 can either be hardwired to the computer at the treatment plant or it can use a cellular modem to transmit the data if there is sufficient cellular signal.

What would the maintenance plan for the monitoring equipment entail?

The maintenance plan for the system would entail a yearly maintenance contract with the manufacturer. A Hach Service Representative would regularly service the monitoring equipment. This service would take care of all parts, labor, and preventative maintenance and would include 2-3 scheduled maintenance visits per year.

Describe the proposed sampling plan at the monitoring site.

The sc1000 monitors the quality of water flowing through the trough in real time, and can transmit this data back to the plant as it is collected. The actual timing of the sampling plan could be determined by the utility.

Describe the proposed procedures for data management and analysis.

It is recommended that the utility purchase the Hach Universal Data Gateway software, which would help to process and analyze the incoming information into easily interpreted reports. The price of this software is included in the rough capital cost.

TE TETRA TECH

B-3. Real Tech Full Scanning UV-VIS Monitoring System

Describe the type of early warning detection equipment that could be installed, including the design.

The Real Tech Full Scanning UV-VIS monitoring system, which provides full ultraviolet/visible scanning for organics and other specific parameters that may indicate a contamination event. The included PC Controller is pre-loaded with the software needed to store and process this information to establish a "normal" or "baseline" set of conditions for the raw water source. In addition to the UV-VIS sensors, the system can accommodate up to 8 additional sensors that are available from a third party and priced separately.

This plan includes pricing and details for a system equipped to measure conductivity, pH, temperature, and dissolved oxygen. Other additional sensors could be purchased and added if deemed necessary by the utility.

Where would the equipment be located?

In the case of Craigsville PSD, the UV-VIS Full Monitoring System could be located in the water treatment plant since it is so close to the raw water intake. A small-diameter sampling line would run from the treatment plant to the intake pipe to pull raw water back to the controller where it would flow into the unit for testing. The closer the end of the sampling line can be to the actual intake, the more accurately it will reflect the raw water that is entering the plant. This option would require the utility to purchase enough line to reach the intake as well as a small pump. The sampling line and pump could be fairly small and inexpensive, as the system only requires a minimum of 300-800 mL/min. of flow. The system also includes the Real Pump Clean System, which provides flow and automatic chemical cleaning of the sensors and reduces maintenance time.

This system would require a reliable electrical source, but the intakes are located adjacent to the treatment plant at Craigsville so an electrical supply would be readily available.

What would the maintenance plan for the monitoring equipment entail?

The maintenance plan for the system would require about 2 hrs/month for scheduled maintenance tasks. It is also recommended that a monthly laboratory reference sample is taken to effectively calibrate the sensors.

The Smart-Sense Web Monitoring Service package costs an additional \$499/yr., but provides additional support and remote accessibility by Real Tech, and it is recommended. The Deuterium and Tungsten lamps would also need to be replaced every six months at a cost of \$740.

Describe the proposed sampling plan at the monitoring site.

The Full Scanning UV-VIS system continuously monitors raw water as it is pumped through the unit, and is capable of establishing baseline conditions that account for seasonal variability, which can help to reduce false alarms.

Describe the proposed procedures for data management and analysis.

The Real Tech monitoring system is capable of communicating with the treatment plant computer via Modbus, Ethernet, USB, or cell modem. It can be integrated with the treatment plant's SCADA system to provide real-time information about conditions at the intake and provides full remote monitoring.

It is also recommended that the utility take advantage of the Smart-Sense Web Monitoring service offered by Real-Tech to analyze and interpret data taken by the monitoring system. This consultation service requires an additional service fee, which is included in this quote.



APPENDIX C. COMMUNICATION PLAN TEMPLATE

Craigsville PSD

PWSID: WV3303402 **District:** Beckley District

Certified Operator: Lundy Bailey

Contact Phone Number: Water Treatment Plant- 304-742-3585

Contact Email Address: chief.operator@yahoo.com

Plan Developed On: 2/15/2016

ACKNOWLEDGMENTS:

This plan was developed by Craigsville PSD to meet certain requirements of the Source Water and Assessment Protection Program (SWAP) 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.



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INTRODUCTION

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

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

TIERS REPORTING SYSTEM

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

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

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

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

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

D = Do 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.

Tier	Tier Category	Risk Level	Tier Summary
A	Announcement	Low	The water system is issuing an announcement to the public and public agencies about an incident or event that could pose a threat to public health and safety. Additional information will be provided as it becomes available.
В	Boil Water Advisory	Moderate	Water system users are advised to boil any water to be used for drinking or cooking, due to possible microbial contamination. The system operator will notify users when the boil water advisory is lifted.

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

с	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	Do Not Use	Very High	The water should only be used for flushing commodes and fire protection until further notice. More information on this notice will be provided as soon as it is available.
E	Emergency	Extremely High	The water should not be used for any purpose until further notice. More information on this notice will be provided as soon as it is available.

COMMUNICATION TEAM

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

Water system communication team members, organizations, and roles.

Team Member Name	Organization	Phone	Email	Role
Gary Robinson	Craigsville PSD	304-742-5280	grcpsd@yahoo.com	Primary Spokesperson
Lundy Bailey	Craigsville PSD	304-742-3585	chief.operator@yahoo.com	Secondary Spokesperson
Kris Ward	Craigsville PSD	304-742-3585	chief.operator@yahoo.com	Member
Director	Nicholas County Emergency Management	304-872-7892	-	Member
CraigsvilleTim BlakeVolunteer Fire304-742-5409cbcvfd3@yahoDepartmentControl of the second		cbcvfd3@yahoo.com	Member	

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

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

COMMUNICATION TEAM DUTIES

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

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



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

- Be knowledgeable on elements of the Source Water Protection Plan and Communication Plan
- Attend team meetings to ensure up-to-date knowledge of the system and its functions .
- Participate in periodic exercises that "game out" incident response and communication tasks
- Help to educate local officials, the media, and others on source water protection •
- Cooperate with water supplier efforts to coordinate incident response communication ٠
- Be prepared to respond to requests for field investigations of reported incidents
- Not speak on behalf of the water supplier unless designated as the system's spokesperson •

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

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

INCIDENT / EVENT COMMUNICATION PROCEDURE

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

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

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

- Verification of the incident/event type (spill, release, etc.) •
- Location of incident/event
- Type of material(s) involved in spill, release, etc. •
- Quantity of material involved •
- Potential of the material to move, migrate, or be transported •
- Relevant time factor(s) in the risk assessment (e.g., downstream movement rate) ٠
- Overall level of risk to water system, whether low, moderate, high, or very high
- Development of the initial risk characterization

As the flow chart indicates, several iterative cycles will occur after the initial threat assessment, including communication with local agencies and the public, further investigation of the incident, possible implementation of the water system's contingency plan, and eventual elimination of the threat and a return to normal operations. Communication activities during this period will include:

- The initial release (i.e., Announcement, Boil Water Advisory, Cannot Drink, Do Not Use, or Emergency)
 - 0 Sent to local health agencies, the public, and the news media within 30 minutes
 - Notification of the local water system's source water protection and communication teams
 - If warranted by initial findings regarding the spill, release, or incident 0



- Notification of the WV Bureau of Public Health
 - As required
- Periodic information updates, as incident response information is received
- Updates to the applicable A-B-C-D-E advisory tier, as necessary

If time permits and the need arises, after the threat level is reduced and operations return to normal the water system staff, the communication and source water protection teams, and their partners 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



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.

EMERGENCY SHORT FORMS

Emergency Communication Information

		Name	ame Phone Number		Email		
Designated spokesperson:		Lundy Bail	еу	(WTP) 304-742	-3585	chief	operator@yahoo.com
Alternate spokesperson:		Gary Robin	son	304-742-528	30	g	rcpsd@yahoo.com
Designated location to disseminate information to media:		Craigsville PSD Office					
Methods of contacting affected residents:		Craigsville PSD uses several methods to provide important information to affected customers. Their primary method of communication is the Nicholas County Code Red telephone network. This system allows the utility to quickly contact large numbers of customers in specific areas of the distribution system by telephone or text. The utility also posts notices in local businesses, makes radio announcements, and posts information to the Craigsville PSD website and Facebook page.					
	Nam	e	Title		P Ni	hone umber	Email
Media contacts:	97.1 Ra	adio Su	Summit Media Radio- Sutton, WV		304-7	765-7373	al@summitmediawv.com
	WSA	Z Affil	News Channel 3, NBC Affiliate- Charleston, WV		304-3	344-3521	news@wsaz.com

Emergency Services Contacts

	Name	Emergency Phone	Alternate Phone	Email
Local Police	Nicolas County Sheriff	911	304-872-7880	-
Local Fire Department	Craigsville Volunteer Fire Department	911	304-742-5409	cbcvfd3@yahoo.com



Craigsville PSD

Local Ambulance Service	Redi Care Incorporated Station 1	911	304-742-3813	-
Hazardous Material Response Service	Brenntag Mid South Response Team/ Craigsville Volunteer Fire Department	911	Regional Hotline- 800-777-4379 Brenntag Mid South- 270-830-1200	Brenntag Mid South gcritser@brenntag.com

Sensitive Populations

Other communities that are served by the utility:	Camden on Gauley				
	Name	Emergency Phone	Alternate Phone		
	Gauley River Elementary School	304-742-5271	-		
Majar	Nicolas County Career/Technical School	304-742-5416	-		
Major user/sensitive population notification:	Bright Horizons Sheltered Workshop	304-742-6202	-		
	Camden Medical Center	304-226-5735	-		
	Columbia Forest Products	304-742-5317	-		
	Gauley River Elementary School	304-742-5271	-		
	Name	Phone	Email		
		Office- 304-256-6666			
EED District Office Contact:	Chris Farrish	EED Central Office 304-558-2981	<u>chris.b.farrish@wv.gov</u>		
		Cell- 304-575-8524			
OEHS Readiness Coordinator Warren Von Dollen		304-356-4290 (main) 304-550-5607 (cell)	warren.r.vondollen@wv.gov		
	Water System Name	Contact Name	Emergency Phone	Alternate Phone	
---	--	---------------------------------------	---------------------------------	--------------------------------	
	Summersville	Robert Brown	304-872-3347		
	Kanawha Falls PSD Rick Wagner		Treatment Plant 304-779-2600	Cell 304-877-8761	
Downstream Water Contacts:	n Armstrong PSD	Joe Burdett	Treatment Plant 304-442-5044	Don Navarro 304-442-5647	
	WVAW-Montgomery District	AW-Montgomery District Dave Peters		304-340-2038	
	Community of Cedar Grove Kenneth Barton		Treatment Plant 304-595-2991	Utility Office 304-595-1841	
Are you planning on implementing the TIER system?				Yes	

Key Personnel

	Name	Title	Phone	Email
Key staff responsible for coordinating	Gary Robinson	General Manager	304-742-5280	grcpsd@yahoo.com
emergency response procedures?	Lundy Bailey	Chief Operator	(WTP) 304-742-3585	chief.operator@yahoo.com
Staff responsible for keeping confidential PSSC	Gary Robinson	General Manager	304-742-5280	grcpsd@yahoo.com
information and releasing to emergency responders:	Lundy Bailey	Chief Operator	(WTP) 304-742-3585	chief.operator@yahoo.com

Emergency Response Information

	Name			Phone
	REIC Laboratory- Beaver, WV		8	00-999-0105, 304-255-2500, info@reiclabs.com
List laboratories available to perform sample analysis in case of emergency:	Analabs- Crab Orchard, WV			1-800-880-6406, analabs@analabsinc.com
	WV State Laboratory, Environmental Chemistry Section- Charleston, WV			304-965-2694
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		Yes
When was the Emergency R	eloped or last updat	ted?	The plan was last updated in 2015.	

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/



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
investiga	ting an incide	ent that may affect local wate	er quality.
The incid	ent 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: _____

TE TETRA TECH

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: _____

TE TETRA TECH

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: _____

TE TETRA TECH

APPENDIX D. SINGLE SOURCE FEASIBILITY STUDY



Source Water Protection Plan

Contingency Plan and Feasibility Study

CRAIGSVILLE PSD

PWSID WV3303402 NICHOLAS COUNTY

SEPTEMBER 2015

Prepared by:

Tetra Tech, Inc. 803 Quarrier Street, Suite 400 Charleston, WV 25314

In cooperation with Craigsville PSD





Victor D'Amato, PE

91 Date

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Appendix A. Early Warning Monitoring System

Appendix B. Single Source Feasibility Study Matrices and Narrative

Background

To fulfill the requirements of Senate Bill 373 and Legislative Rule 64 CSR 3, Craigsville PSD has participated in a study to evaluate its existing contingency planning and feasibility of source water alternatives. This Contingency Planning and Feasibility Study report documents the results of the study and provides information about the utility's ability to prevent contaminants from entering the water system if possible, and sufficiently respond to an emergency if necessary. This report represent only a portion of the required elements of the Source Water Protection Plan for Craigsville PSD. The information presented in this report will be included in the final Source Water Protection 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. Utilities should examine their capacity to protect their intake, treatment, and distribution system from contamination. They should also review their ability to use alternative sources, minimize water loss, meet future water demands, and operate during power outages. In addition, utilities should report the feasibility of establishing an early warning monitoring system. The following sections address these considerations and present information required for the source water protection plan.

Responding to Water Shortage or Contamination Event

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

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

Raw and treated water storage capacity in the event of such an emergency also becomes extremely important. Storage capacity can directly determine how effectively a water system can respond to a contamination event and how long an intake can remain closed. Information regarding the water shortage response capability of Craigsville PSD is provided in **Table 1**.

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/). Craigsville PSD has analyzed its ability to effectively respond to emergencies and this information is also provided in **Table 1**.

Can the utility isolate or divert contamination from the intake or groundwater supply?	Yes
Describe the utility's capability to isolate or divert potential contaminants:	The utility has access to booms if the contaminant was on the surface, which would help to isolate the intake somewhat depending on the type of contaminant they were dealing with.
Can the utility switch to an alternative water source or intake that can supply full capacity at any time?	No
Describe in detail the utility's capability to switch to an alternative source:	N/A
Can the utility close the water intake to prevent contamination from entering the water supply?	Yes
How long can the intake stay closed?	The intake could stay closed for approximately 1.81 days before they were in a critical water shortage situation.
Describe the process to close the intake:	The operator can shut down the intake pumps to prevent contaminants from entering the plant. This process is as simple as manually flipping a few switches.
	Craigsville PSD does not have any raw water storage.
	Total treated water storage is around 999,050 gal. (counting the clear well at the treatment facility)
	Cottle Tank- 150,000 gal.
Describe the raw and treated water storage capacity of the water system:	Craigsville Old Tank- 125,000 gal.
· · · · · · · · · · · · · · · · · · ·	Craigsville New Tank- 300,000 gal.
	Mt. Zion Tank- 200,000 gal.
	Cut Hill Tank- 191,000 gal.
	Total treated water storage capacity in tanks = 966,000 gal.
Is the utility a member of WVRWA Emergency Response Team?	Yes
Is the utility a member of WV-WARN?	Yes

Table 1. Craigsville PSD Wate	r Shortage Response Capability
-------------------------------	--------------------------------

	The utility has informal mutual aid agreements with several nearby systems (Summersville, Cowen, and
List any other mutual aid agreements to provide or	Richwood) for equipment sharing, treatment
receive assistance in the event of an emergency:	materials, assistance during emergencies. They
	have utilized these agreements in the past and have
	given assistance when needed.

Operation During Loss of Power

Craigsville PSD 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 summarized in **Table 2**.

Table 2. Craigsville PSD Generator Capacity

What is the type and capacity of the generator needed to operate during a loss of power?	Craigsville PSD would need mu the water system during a por do not own any generators companies and emergency man them. The plant would requi operate at full capacity. The Co a 50 kW generator, the Craigsy a 125 kW generator, and the requires a 35-50	Itiple generators to operate wer outage. They currently and would rely on rental nagement services to supply ire a 300 kW generator to ottle Booster Pump requires ville Booster Pump requires e Mt. Zion Booster Pump kW generator.
Can the utility connect to generator at intake/wellhead? If yes, select a scenario that best describes system.	No- The raw water intake is powered by the treatment plant so it does not require a generator of its own.	
Can the utility connect to generator at treatment facility? If yes, select a scenario that best describes system.	Yes- The treatment facility is fully wired for a generator that will be rented or borrowed in an emergency.	
Can the utility connect to a generator in distribution system? If yes, select a scenario that best describes system.	Yes- The booster pump stat generator that will be ren emerge	ions are fully wired for a nted or borrowed in an ency.
Does the utility have adequate fuel on hand for the generator?	(lity have adequate fuel on hand for the generator? No. The utility has some fuel storage but not enough operate for very long.	
	Gallons	Hours
What is your on-hand fuel storage and how long will it last operating at full capacity?	50-75 gallons of diesel storage on a trailer that can be moved between locations	1.5 hours if all generators were operating at once

	Supplier			Contact Information
Provide a list of suppliers that could provide generators and fuel in the event of an emergency:	Generator	Sunbelt Rentals- Charleston, WV		(304) 342-5000, pcm168@sunbeltrentals.com
	Generator	WV Office of Homeland Security and Emergency Management		(304) 558-5380
	Fuel	Army National Guard		N/A
Fuel		Craigsville PSD		(304) 742-3585
Does the utility test the generator(s) periodically?			N/A	
Does the utility routinely maintain the generator?				N/A
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:		Craigsville PSD focuses on the clock operation to ens of an emergency. They w rental companies as need the event	constant preparation and round sure all tanks are full in the event vould place calls to EMS and the ded to get generators and fuel in of an emergency.	

Future Water Supply Needs

When planning for potential emergencies and developing contingency plans, a utility needs not only to consider their current demands for treated water but also account for likely future needs. This could mean expanding current intake sources or developing new ones in the near future. This can be an expensive and time consuming process, and any water utility should take this into account when determining emergency preparedness. Craigsville PSD has analyzed its ability to meet future water demands at current capacity, and this information is included in **Table 3**.

Table 3. Future Water Supply Needs for Craigsville PSD

	The utility is currently in the process of seeking a plant expansion which will allow them to produce 1,296,000 GPD. This upgrade would include improving the intake, sedimentation basin, and filter
Is the utility able to meet water	basins. With this upgrade the utility expects to be able to meet
demands with the current production	future demands. This opinion is generally supported by population
capacity over the next 5 years? If so,	trends projected based on US Census Bureau 2000 and 2010 data.
explain how you plan to do so.	According to the 2005 Interim State Population Projections ⁽¹⁾ , WV
	as a whole will see a population decline between 2010 and 2030.
	In addition, researchers at the WVU College of Business and
	Economics specifically project that populations within Nicholas
	County will decrease from a population of 26,233 in 2010 to a

	projected population of 25,878 in 2020 ⁽²⁾ . Census data and projections cannot account for increases in daily demand due to water line extensions. If future water line extension projects are proposed, the daily demands will be reassessed to determine if the source and treatment facilities can support increased demand.
If not, describe the circumstances and plans to increase production capacity:	N/A

(1)US Department of Commerce, United State Census Bureau. 2005 Interim State Population Projections. Table 1. <u>http://www.census.gov/population/projections/data/state/projectionsagesex.html</u>. Accessed June 10, 2015.

(2) Christiadi, Ph.D., Deskins, John, Ph.D., Lego, Brian. WVU College of Business and Economics, Bureau of Business and Economic Research. March 2014. WVU Research Corporation. <u>http://be.wvu.edu/bber/pdfs/BBER-2014-04.pdf</u> Accessed June 10, 2015.

Water Loss

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. This can include unmetered uses, leaks, and other losses. To measure and report on this unaccounted for water, a public utility must use the same method used in the Public Service Commission's rule, *Rules for the Government of Water Utilities*, 150CSR7, section 5.6. The rule defines unaccounted for water as the volume of water introduced into the distribution system less all metered usage and all known non-metered usage which can be estimated with reasonable accuracy.

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, and water used for backwashing filters, and cleaning settling basins. By totaling the metered and non-metered uses the utility can calculate unaccounted for water. Note: To complete annual reports submitted to the PSC, utilities typically account for known water main breaks by estimating the amount of water lost. However, for the purposes of the source water protection plan, any water lost due to leaks, even if the system is aware of how much water is lost at a main break, is not considered a use. Water lost through leaks and main breaks cannot be controlled during a water shortage or other emergency and should be included in the calculation of percentage of water loss for purposes of the source water protection plan. The data in **Table 4** is taken from the most recently submitted Craigsville PSD PSC Annual Report.

Total W	205,567,000			
Total Wa	1,000			
Total Water Pu	mped and Purchased (gal)	205,568,000		
	Mains, Plants, Filters, Flushing, etc.	0		
	Fire Department	120,000		

Table 4. Water Loss Information*

Water Loss Accounted for Except Main Leaks (gal)		Back Washing	0			
	Blo	owing Settling Basins	0			
Total Water Loss Ac	120,000					
Water Sol	117,142,000					
Unaccounte	75,674,000					
Water lost	from main	leaks (gal)	12,632,000			
Total gallons of Unaccounte Ma	88,306,000					
Total Percent Unaccounted	42.96%					
If total percentage of Unac for Water is greater than 15 describe any measures that taken to correct this pro	counted %, please could be blem:	Craigsville PSD currently has a leak detection and correction program and they have contacted a consultant to perform a more in depth leak detection survey.				

*This information is from the 2014 Public Service Commission Annual Report for Craigsville PSD

Early Warning Monitoring System

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

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

a baseline will help determine if changes in the water quality are indicative of a contamination event and inform the needed response.

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

Craigsville PSD 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 5** and in **Appendix A.**

Table 5. Ea	rly Warning	Monitoring S	System Ca	pabilities
			,	

Does your system currently receive notifications from a state agency neighboring water system, loca emergency responders, or othe facilities? If yes, from whom do y receive notices?	spill y, l r ou	Yes- The utility has received notices and alerts from Craigsville Sewer, which is just upstream of the plant. They would also receive notices from Adkins Oil and the Town of Camden on Gauley, both of which lie upstream of the water treatment facility.				
Are you aware of any facilities, la uses, or critical areas within you protection areas where chemica contaminants could be released spilled?	nd ır al or	Yes. The primary contamination threats to the water treatment plant are active and abandoned mine lands within the Zone of Critical Concern, as well as Craigsville Wastewater Treatment Plant, which is just upstream.				
Are you prepared to detect poten contaminants if notified of a spil	tial I?	Yes. If notified of a spill or contamination event, the operators would collect raw water grab samples from the Gauley River at or upstream of the raw water intake.				
	Laboratories					
		Laboratori	es			
		Laboratori Name	es Contact			
List laboratories (and contact information) on whom you would		Laboratori Name REIC Laboratory- Beaver, WV	es Contact 800-999-0105, 304-255-2500, info@reiclabs.com			
List laboratories (and contact information) on whom you would rely to analyze water samples in case of a reported spill.		Laboratori Name REIC Laboratory- Beaver, WV Analabs- Crab Orchard, WV	es Contact 800-999-0105, 304-255-2500, info@reiclabs.com 1-800-880-6406, analabs@analabsinc.com			
List laboratories (and contact information) on whom you would rely to analyze water samples in case of a reported spill.	WV	Laboratori Name REIC Laboratory- Beaver, WV Analabs- Crab Orchard, WV State Laboratory, Environmental emistry Section- Charleston, WV	es Contact 800-999-0105, 304-255-2500, info@reiclabs.com 1-800-880-6406, analabs@analabsinc.com 304-965-2694			

Does your utility currer water (through continu or periodic grab sample water intake or from source on a regu	ntly monitor raw yous monitoring es) at the surface a groundwater Ilar basis?	No. See Form B in Appendix A .				
Provide or estimate the capital and O&M costs for your	Monitoring System	YSI EXO 2 (Table B-1)	Hach sc1000 (Table B-2)	Real Tech Full Scanning Monitoring System (Table B-3)		
	Capital	Approximate Capital Cost- \$19,000	Approximate Capital Cost- \$18,907	Approximate Capital Cost- \$24,155		
warning monitoring system or upgraded system.	Yearly O & M	Parts and calibration- Approximately \$1,000 Data management and telemetry- \$1,000	Full service contract with Hach Service Representative- \$2,258 Online Viewer-\$600	Replacement Lamps- \$1,480 Smart-Sense Monitoring Service- \$499		
Do you serve more customers? If so, plea methods you use to i same technical leve ORSANC	than 100,000 se describe the monitor at the Is utilized by O.		No	·		

Single Source Feasibility Study

If a public water utility's water supply plant is served by a single–source intake in a surface water source of supply or a surface water influenced source of supply, the submitted source water protection plan must also include an examination and analysis of the technical and economic feasibility of developing alternative sources of water to provide continued safe and reliable public water service in the event 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 raw or treated water storage in addition to what is currently stored to meet water system design standards, interconnection with neighboring systems, or other options identified on a local level. Note that a secondary intake must draw water supplies from a substantially different location on the same water source, or from an entirely different water source.

To accomplish this requirement, the utility has examined existing and possible alternatives and ranked them by their technical, economic, and environmental feasibility according to the West Virginia Department of Health and Human Resources Bureau for Public Health (WVBPH) feasibility study guide. This guide provides several criteria to consider for each category, organized in a Feasibility Study Matrix. By completing the Feasibility Study Matrix, the utility has documented the process used to examine the feasibility of each alternative, and has generated scores that compare the alternatives. The Feasibility Study Matrix is attached as **Appendix B**.

In addition to the Feasibility Study Matrix spreadsheet, a brief narrative is also included in **Appendix B** that identifies one or more feasible alternative, provides a summary of data used to make this determination, and briefly summarizes the results of the matrix.

Appendix A. Early Warning Monitoring System

Form B- Proposed Early Warning Monitoring Systems

Craigsville PSD

Primary Surface Water Source:

There are many possible solutions for designing and installing an early warning monitoring system. Over time, this technology changes and improves and it is difficult to determine the type of equipment that will be useful and effective in the long term. This plan is a proposed system that would work for Craigsville PSD using current technology and the current plant and intake configuration.

The primary water source for Craigsville PSD is the Gauley River, and the raw water intake is located approximately 200' away from the treatment plant.

Table B-1. YSI EXO 2 Monitoring System Proposal
Describe the type of early warning detection equipment that could be installed, including the design.
This plan uses the YSI EXO 2 Multiport Sonde, which can accommodate 6 different sensors and has an automatic wiper mechanism to remove biofouling from the sensor tips, which reduces maintenance time. The sonde is built to be resilient and low maintenance, and is capable of providing online water quality monitoring that can be transmitted real time to a designated PC or website that can be accessed by any designated user.

The sonde can hold up to 6 sensors, but this plan recommends 4 of the more basic sensors that would be sufficient to detect any sudden shifts in water quality in any West Virginia stream or river. These sensors would include: conductivity/temperature, optical dissolved oxygen, pH, and fluorescent dissolved organic matter (fDOM). The fDOM sensor could potentially detect petroleum products in the water but is not entirely reliable for this purpose. At this time, YSI does not make a sensor for petroleum products for the EXO 2 but likely will in the future, at which time it is recommended that the utility purchase it. Other sensors could be purchased in the future as well if deemed necessary by the utility.

Where would the equipment be located?

The sonde would be attached to the intake pipe itself, which extends into the Gauley River. This would provide a stable foundation for the equipment and also ensure that the device is able to sample the water that is actually entering the intake pipe and not missing potential contaminants because it is located on the wrong side of the stream or too far from the intake. The suggested method of mounting the sonde involves drilling holes in a PVC pipe, capping the end, inserting the sonde and attaching to the intake pipe structure using brackets or chains. This will protect the sensor from debris and hide it from view somewhat.

The sonde would be hardwired to the YSI Storm 3 data analysis/telemetry system. Since the Craigsville PSD water treatment plant is so close to the intake, the Storm 3 could be located in the plant itself. If this was not possible and it needed to be located on the bank closer to the intake, the unit is contained in a waterproof case that could be located in the structure that currently houses the raw water pumps. The YSI system comes equipped with a solar photovoltaic panel capable of powering both the data analysis unit and the sonde, so long as the sonde is hardwired to the Storm 3. The device can be battery powered as well if this is not an option.

What would the maintenance plan for the monitoring equipment entail?

The maintenance plan for the system would involve replacing the dissolved oxygen sensor cap, replacing the pH electrode cap, and purchasing pH, turbidity, and conductivity calibration solution on a yearly basis. The sonde itself is designed to last from 5-10 years and should be inspected and calibrated once a month.

In addition, there is a recurring yearly fee associated with the real-time data/telemetry package for managing the website and data analysis.

Describe the proposed sampling plan at the monitoring site.

The sonde can be programmed to take regular measurements at any intervals defined by the operator or user. These measurements can also be taken in bursts, averaged over a period of time, or modified automatically as water quality levels change. Data is stored in the Storm 3 and transmitted to the plant computer as it is recorded. This information can be transmitted wirelessly via a cellular modem. The cellular transmitter is powerful enough to work even in areas with poor cell reception.

Describe the proposed procedures for data management and analysis.

The Storm 3 package includes data management software that can generate data reports and presentations and allow the user to modify and adjust sampling schedules remotely from the plant.

The sonde can be programmed to alert the user when any of the water quality parameters exceeds a userdefined level. This will allow the operator to program the system to notify them when their previously observed baseline conditions are exceeded in time for them to shut down the pumps and close off the intake. The operator can receive alerts via text message and email at the treatment plant computer or any designated cell phone.

Table B-2. Hach sc1000 Monitoring System Proposal

Describe the type of early warning detection equipment that could be installed, including the design.

The Hach sc1000 online monitoring system includes a controller, back panel, display module, and trough. Raw water is pumped into the trough from the source where it can be sampled in real time. The probe module can accommodate up to 6 sensors, which means it can monitor up to 6 parameters at once. This plan suggests the following sensors: conductivity, pH, turbidity, and dissolved oxygen. Hach can also supply a sensor to detect oil in water, which would cost an additional \$18,414.00 and would be a good investment for any water system if sufficient funds were available. This sensor is not included in the quoted capital cost. There are several other probes for other parameters that are available from Hach, and these could be purchased as deemed necessary by the utility.

Where would the equipment be located?

The sc1000 Controller, back panel, and trough could be located in the plant itself. A small diameter line would run out from the plant the length of the intake pipe to pull raw water back to the controller where it would flow into the trough for sampling. The closer this sampling line can be to the actual intake, the more accurately it will reflect the raw water that is actually entering the plant. This option would require the utility to purchase a line or hose long enough to reach the intake pipe and a small pump. The line and pump could be fairly low-tech and inexpensive, as the sc1000 only requires a minimum of 900 mL/min. of flow.

The controller will be equipped with the MODBUS advanced communications/networking unit, which can transmit readings in real time directly to the SCADA system in the treatment plant to alert the operators in any change in baseline water quality. The sc1000 can either be hardwired to the computer at the treatment plant or it can use a cellular modem to transmit the data if there is sufficient cellular signal.

What would the maintenance plan for the monitoring equipment entail?

The maintenance plan for the system would entail a yearly maintenance contract with the manufacturer. A Hach Service Representative would regularly service the monitoring equipment. This service would take care of all parts, labor, and preventative maintenance and would include 2-3 scheduled maintenance visits per year.

Describe the proposed sampling plan at the monitoring site.

The sc1000 monitors the quality of water flowing through the trough in real time, and can transmit this data back to the plant as it is collected. The actual timing of the sampling plan could be determined by the utility.

Describe the proposed procedures for data management and analysis.

It is recommended that the utility purchase the Hach Universal Data Gateway software, which would help to process and analyze the incoming information into easily interpreted reports. The price of this software is included in the rough capital cost.

A-3

Table B-3. Real Tech Full Scanning UV-VIS Monitoring System

Describe the type of early warning detection equipment that could be installed, including the design.

This plan utilizes the Real Tech Full Scanning UV-VIS monitoring system, which provides full ultraviolet/visible scanning for organics and other specific parameters that may indicate a contamination event. The included PC Controller is pre-loaded with the software needed to store and process this information to establish a "normal" or "baseline" set of conditions for the raw water source. In addition to the UV-VIS sensors, the system can accommodate up to 8 additional sensors that are available from a third party and priced separately.

This plan includes pricing and details for a system equipped to measure conductivity, pH, temperature, and dissolved oxygen. Other additional sensors could be purchased and added if deemed necessary by the utility.

Where would the equipment be located?

In the case of Craigsville PSD, the UV-VIS Full Monitoring System could be located in the water treatment plant since it is so close to the raw water intake. A small-diameter sampling line would run from the treatment plant to the intake pipe to pull raw water back to the controller where it would flow into the unit for testing. The closer the end of the sampling line can be to the actual intake, the more accurately it will reflect the raw water that is entering the plant. This option would require the utility to purchase enough line to reach the intake as well as a small pump. The sampling line and pump could be fairly small and inexpensive, as the system only requires a minimum of 300-800 mL/min. of flow. The system also includes the Real Pump Clean System, which provides flow and automatic chemical cleaning of the sensors and reduces maintenance time.

This system would require a reliable electrical source, but the intakes are located adjacent to the treatment plant at Craigsville so an electrical supply would be readily available.

What would the maintenance plan for the monitoring equipment entail?

The maintenance plan for the system would require about 2 hrs/month for scheduled maintenance tasks. It is also recommended that a monthly laboratory reference sample is taken to effectively calibrate the sensors.

The Smart-Sense Web Monitoring Service package costs an additional \$499/yr., but provides additional support and remote accessibility by Real Tech, and it is recommended. The Deuterium and Tungsten lamps would also need to be replaced every six months at a cost of \$740.

Describe the proposed sampling plan at the monitoring site.

The Full Scanning UV-VIS system continuously monitors raw water as it is pumped to through the unit, and is capable of establishing baseline conditions that account for seasonal variability, which can help to reduce false alarms.

Describe the proposed procedures for data management and analysis.

The Real Tech monitoring system is capable of communicating with the treatment plant computer via Modbus, Ethernet, USB, or cell modem. It can be integrated with the treatment plant's SCADA system to provide real-time information about conditions at the intake and provides full remote monitoring.

It is also recommended that the utility take advantage of the Smart-Sense Web Monitoring service offered by Real-Tech to analyze and interpret data taken by the monitoring system. This consultation service requires an additional service fee, which is included in this quote.



Appendix B. Single Source Feasibility Study Matrices and Narrative

Single Source Alternatives Feasibility Study CRAIGSVILLE PSD PWSID: WV3303402



PURPOSE

This Source Water Alternatives Feasibility Study (the Study) is prepared in accordance with legislative rule 64CSR3. The rule provides for numerous source water protection planning activities. As part of these activities if a secondary source of water supply is not already developed, public water systems (PWSs) are required to prepare a study to determine the technical and economic feasibility of the following options to provide continued water service in the event the source water becomes contaminated. The options include:

- Constructing or establishing a secondary or backup intake which would draw water supplies from a substantially different location or water source;
- Constructing additional raw water storage capacity and/or treated water storage capacity to provide at least two days of system storage based on the plant's maximum level of production experience in the last year;
- Creating or constructing an operation interconnection(s) between PWS with other PWS plants or another PWS to allow the utility to receive its water from a different source of supply;
- Any other alternative which is available to the PWSU to secure a safe and reliable alternative water supply.

If one or more of the above options is determined to be feasible the PWS is required to provide additional detail on the costs, risks and benefits of implementing each feasible alternative.

This Study utilizes the matrix provided by the West Virginia Department of Health and Human Resources, Bureau for Public Health to determine the feasibility of the alternatives for the Craigsville Public Service District (PSD). The matrix provides a systematic method of evaluating alternatives using numerous factors and a system to rank the economic technical and environmental feasibility of each alternative.

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SYSTEM DESCRIPTION

The Craigsville PSD PWS provides water service to approximately 4,500 people. Located in Nicholas County, the PWS uses the Gauley River as its raw water supply. **Figure 1** presents the location of the PWS. The current capacity of the water treatment plant (WTP) is 0.806 MGD. The WTP uses pre-chlorination, coagulation with powdered activated carbon and alum, filtration and chlorination to treat the water to potable standards. There are currently plans to expand the capacity of the WTP to 900 gallons per minute (GPM) (1.3 MGD) which will provide extra capacity to serve the system and reduce the daily operating time of the WTP. **Table 1** below provides a summary of the capacity and recent annual average day and maximum day demands for the Craigsville system.

Parameter	Value
2014 Average Day Demand (ADD) (MGD)	0.553
2014 Maximum Day Demand (MDD) (MGD)	0.783
WTP Capacity (MGD)	0.806 ⁽¹⁾
WTP Utilization	68.6%
MDD to ADD Ratio ⁽²⁾	2.5

Table 1. Craigsville PSD Capacity and Demands

(1) Based on 24 hour operation time

(2) Based on the 2014 Maximum Daily Demand (MDD) divided by the 2014 Average Daily Demand (ADD)

Storage in the Craigsville system uses of a mix of ground and elevated storage tanks throughout the distribution system to equalize demands. **Table 2** provides a summary of the tanks.

Table 2. Craigsville PSD Storage

Name	Туре	Volume (gallons)
Cottle Tank	Ground	150,000
Craigsville Old Tank	Elevated	125,000
Craigsville New Tank	Elevated	300,000
Mt. Zion Tank	Elevated	200,000
Cut Hill Tank	Ground	191,000
Total		966,000
2014 ADD (MGD)		0.553
Days storage		1.81 days

In normal operation of the tanks, the Cottle Tank receives potable water from the water treatment plant. A booster pump at the Cottle Tank pressurizes the two elevated Craigsville Tanks and the Craigsville Tanks in turn pressurize Mt. Zion. The Cut Hill Tank is connected to and supplies the Summersville PWS. In general the tanks are fully utilized and the PWS does not have a problem getting 20% turnover of volume (§64-77-9.4). If the tanks were full when the WTP went off-line and non-essential water uses were limited the PWS staff believes that water could be supplied for up to 3 days. This would be contingent on large industrial users curtailing their water usage.

The Cut Hill tank is connected to the Summersville PWS and could possibly gravity feed a smaller portion of the Craigsville service area if needed.



Figure 1. Craigsville PSD Location Map

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ALTERNATIVES

The alternatives are evaluated based on their ability match the proposed expanded capacity of the Craigsville WTP. This will provide a common level of service among all alternatives. **Table 3** below provides the basis for sizing each alternative:

Alternative	Backup Intake	Raw Storage	Treated Storage	Interconnect
Basis	Max day 2 days of r dema		2 days of max day demand	Average day
Value	1.3 MGD	2.6 MGD	2.6 MGD	0.92 ⁽¹⁾ MGD

Table 3. Alternatives – Sizing Basis

(1) Calculated using Maximum Daily Demand (MDD)/Average Daily Demand (ADD) Ratio

Cost estimates were developed based on a conceptual analysis of each alternative. All costs were reviewed for accuracy and compared with actual costs of similar projects and RSMeans CostWorks 2014. The estimates include materials, installation and contractor's overhead and profit. The estimates are also based on the following assumptions and considerations:

- Piping is priced as mechanical joint ductile iron unless noted otherwise, and includes provisions for road crossings, aerial crossings and site restoration.
- Raw water and treated water storage tanks are priced as steel ground tanks with site work and installation included.
- Pumps are sized and priced based on conceptual level estimates of the required pumping conditions (flow and total dynamic head).
- Precast concrete vaults and metal pump enclosures are sized to house the estimated number of pumps required along with HVAC, electrical, and controls equipment.
- Electrical and controls costs are estimated at 10% of the overall facility costs including pumps.
- Site work is estimated as a lump sum cost based on the approximate size of the disturbed area and other factors that affect level of effort (e.g., whether or not the site is within the 100-yr floodplain).
- Estimates include a 15% engineering allowance and a 30% contingency.
- For purposes of this comparative analysis, costs for land acquisition were estimated at an average \$70,000 per acre. This value was used consistently for each alternative and was selected as an average cost to account for unknown site specific variables (e.g. land and structure values, potential remediation costs, acquisition services, etc.).

All capital costs are annualized over a twenty year period using a 2.5% interest rate and 0.50% closing costs.

O&M cost estimates are developed based on the specific operational requirements for each alternative and include labor and materials. Estimates of power consumption of pumps are based on pump size, number of pumps, and estimated hours of operation. Tank O&M cost estimates assume the exterior and interior are repainted every ten years and the raw water tanks are cleaned annually and treated water tanks cleaned every 5 years.

<u>Backup Intake</u>

Strouds Creek is the closest water body to the WTP but PWS personnel have indicated that it does not have the capacity to meet demands year round. Therefore, Strouds Creek was not considered as a viable water source. A search of waterbodies with available flow data within an eight mile radius of Craigsville indicates that the

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Cranberry River, a downstream tributary of the Gauley, has adequate flow to meet Craigsville needs. A potential supply line to the WTP could be routed along the Cranberry Tri Rivers Trail. The proposed intake structure would be sufficiently upstream on the river to eliminate any influence by the Gauley. The intake would be located in the Cranberry Wildlife Management Area which could make seeking approval for construction difficult.

Raw Water Storage

The raw water storage alternative includes installing a 3.0 MG (2.6 MG usable volume) steel ground storage tank on property adjacent to the WTP site. This would require increasing the size of the pumps at the intake structure to fill the tank and installing an additional set of pumps to transfer raw water from the tank to the WTP. Alternatively, a storage reservoir could be built.

Treated Water Storage

Like the raw water storage alternative, this tank would be located adjacent to the WTP and have a similar size and configuration without requiring modifications to the intake pumps. Providing treated water storage over and above the required two days ADD presents some operational challenges for the PWS in meeting the 20% daily turnover requirement. With full tanks the PWS will be faced with having to drain water during periods of low demand to meet the turnover requirement which will increase the amount of non-revenue water for the system.

Interconnection

Of the water systems within a ten mile radius of Craigsville, the City of Summersville PWS currently has sufficient excess capacity (2.1 MGD) to provide average day potable water to Craigsville. There is already an interconnection between the two systems whereby Craigsville can supply water to Summersville by gravity. However, a new pipeline and pump station would be required to supply Craigsville from Summersville. It's important to note that Summersville also uses the Gauley River as a source of supply so its ability to provide service may be limited during a contamination event. A new interconnect would require 75,000 feet of 10" pipe and a pump station located in Summersville.

FEASIBILITY DETERMINATION

The attached matrix and sub-schedules (Tables 4, 5, 6, and 7) present the feasibility rankings of the alternatives.

The Summersville interconnection is the least feasible alternative due primarily to its high capital cost and because it shares a common source water with Craigsville, which could mean it may also be affected by a contamination event on the Gauley River.

A backup intake on the Cranberry River is also costly although it would provide a significant amount of operational flexibility. The alternative has the highest potential for environmental impacts and additional requirements due to its location in a wildlife management area.

Treated water storage is a possible alternative but the potential operational issues associated with having to maintain a 20% turnover in volume reduces its desirability.

Raw water storage is identified as the most feasible alternative of the four, having a relatively moderate economic score and high technical and environmental scores.



Table 4. Feasibility Matrix

	Economic Criteria Technical Criteria								Environmental Criteria						Final Score	Capital Cost	Comments				
Water			45%	,)					45%						109	%			100%		
Management Strategy Description	Operation and Maintenance Costs	Capital Costs	Total	Total %	Weighted Total	Permitting	Flexibility	Resilience	Institutional Requirements	Total	Total %	Weighted Total	Environmental Impacts	Aesthetic Impacts	Stakeholder Issues	Total	Total %	Weighted Total			
Backup Intake	3.0	2.0	5.0	83.3%	37.5%	1.2	3.0	2.7	2.0	8.9	73.9%	33.3%	1.0	1.5	1.0	3.5	38.9%	3.9%	74.6%	\$7,151,000	The nearest identified water source is the Cranberry River. The intake would be located just upstream of where the Cranberry meets the Gauley.
Interconnect	3.0	1.0	4.0	66.7%	30.0%	2.2	1.5	2.7	2.3	8.7	72.5%	32.6%	3.0	3.0	2.0	8.0	88.9%	8.9%	71.5%	\$7,027,000	Summersville pulls from the Gauley River and will likely also be affected during a contamination event
Treated water storage	3.0	2.0	5.0	83.3%	37.5%	1.6	1.5	2.3	2.7	8.1	67.5%	30.4%	3.0	2.5	2.0	7.5	83.3%	8.3%	76.2%	\$3,883,500	Tank would be located at WTP site and tie to the high service pumps.
Raw Water Storage	3.0	2.0	5.0	83.3%	37.5%	2.4	3.0	2.3	2.7	10.4	86.7%	39.0%	3.0	2.5	2.0	7.5	83.3%	8.3%	84.8%	\$3,936,000	This alternative contemplates ground water storage, however, a reservoir of similar volume could also be considered.

Table 5. Alternatives Table

Criteria	Question	Backup Intake	up Intake Feasibility Interconnect Feasibility Treated Water Storage		Feasibility	Raw Water Storage	Feasibility		
	Economic Criteria								
What is the t main	What is the total current budget year cost to operate and maintain the PWSU (current budget year)?			\$940,895.00		\$940,895.00		\$940,895.00	
	Describe the major O&M cost requirements for the alternative?	Electricity for pumping; maintenance	3	labor and materials to maintain pumps	3	Electricity for transfer pumps, labor, maintenance. Does not include the cost for water flushed to maintain the 20% turnover rule.	3	Electricity for transfer pumps, labor, recurring maintenance	3
O and M Costs	What is the incremental cost (\$/gal) to operate and maintain the alternative?	\$2,220.00	3	\$1,700.00	3	\$16,196.00	3	\$17,031.00	3
	Cost comparison of the incremental O&M cost to the current budgeted costs (%).	0.40%	3	0.18%	3	1.72%	3	1.81%	3
	O and M-Feasibility Score		3.0		3.0		3.0		3.0
Describe the ca	pital improvements required to implement the alternative.	Intake structure and pump station; 37,000 ft. of 12" diameter pipe		Piping and pumps station for supply to Summersville		3.0 MG ground storage tank and transfer pumps		3.0 MG Ground storage tank and transfer pumps	
	What is the total capital cost for the alternative?	\$7,151,000	2	\$7,027,000	1	\$3,883,500	2	\$3,936,000	2
Capital Costs	What is the annualized capital cost to implement the alternative, including land and easement costs, convenience tap fees, etc. (\$/gal)?	\$461,000.00	2	\$453,000.00	1	\$254,000.00	2	\$254,000.00	2
	Cost comparison of the alternatives annualized capital cost to the current budgeted costs (%).	49.00%	2	48.15%	1	25.01%	2	25.01%	2
	Capital Cost-Feasibility Score		2.0		1.0		2.0		2.0

Table 5. Alternatives Table (Cont'd)

Criteria	Question	Backup Intake	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility
Technical Criteria									
Permitting	Provide a listing of the expected permits required and the permitting agencies involved in their approval.	See Permitting Sub-schedule	1	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2
	What is the timeframe for permit approval for each permit?	See Permitting Sub-schedule	1	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2
	Describe the major requirements in obtaining the permits (environmental impact studies, public hearings, etc.).	See Permitting Sub-schedule	1	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2	See Permitting Sub-schedule	2
	What is the likelihood of successfully obtaining the permits?	Potential T&T species issues	1	No identified barriers	2	Potential for unaccounted for water issues	1	No identified barriers	3
	Does the implementation of the alternative require regulatory exceptions or variances?	None identified	2	None identified	3	In order to avoid flushing water a variance from the 20% turnover rule would be necessary. Further study and analysis would be required to support the variance.	1	None Identified	3
Permitting-Feasibility Score			1.2		2.2		1.6		2.4
Flexibility	Will the alternative be needed on a regular basis or only used intermittently?	Intermittent	3	Intermittent	2	Full time operations	2	Full time operations; with ability or intermittent	3
	How will implementing the alternative affect the PWSU's current method of treating and delivering potable water including meeting Safe Drinking Water Act regulations? (ex. In the case of storage, will the alternative increase the likelihood of disinfection byproducts?).	No changes in treatment or water delivery with the backup source	3	May not provide protection in a contamination event	1	With the requirement to turn over 20% of tank volume the system will be required to flush water during days when demands are low.	1	There will be additional operating requirements for the new equipment but the existing treatment process will be minimally affected.	3
Flexibility-Feasibility Score			3.0		1.5		1.5		3.0

Table 5. Alternatives Table (Cont'd)

Criteria	Question	Backup Intake	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility
Resilience	Will the alternative provide any advantages or disadvantages to meeting seasonal changes in demand?	Yes, there will be an additional source to draw from during periods of low flow	3	Yes. Interconnect will provide backup in other emergency situations	3	Yes; only short term	2	Yes; only short term	2
	How resistant will the alternative be to extreme weather conditions such as drought and flooding?	Will provide an additional source of supply.	2	No benefit	2	Yes; only short term	2	Yes; only short term	2
	Will the alternative be expandable to meet the growing needs of the service area?	Yes	3	Yes	3	Yes	3	Yes	3
Resilience-Feasibility Score			2.7		2.7		2.3		2.3
Institutional Requirements	Identify any agreements or other legal instruments with governmental entities, private institutions or other PWSU required to implement the alternative.	Possible agreement to locate intake in a Wildlife Management Area	2	Emergency Usage agreement with Summersville	2	None identified	3	None Identified	3
	Are any development/planning restrictions in place that can act as a barrier to the implementation of the alternative?	Possible restrictions associated with a Wildlife Management Area	2	None Identified	3	None identified	3	None Identified	3
	Identify potential land acquisitions and easements requirements.	Easement and/or property purchase for intake and pump stations	2	Easement and/or property purchase for pumps.	2	The tank site would need to be acquired from its current owner	2	The tank site would need to be acquired from its current owner.	2
Institutional Requirements-Feasibility Score			2.0		2.3		2.7		2.7
Environmental Criteria									
Environmental Impacts	Identify any environmentally protected areas or habitats that might be impacted by the alternative.	Intake structure and pipe route are likely to require surveys for T&E species	1	None identified	3	None identified	3	None Identified	3
Environmental Impacts-Feasibility Score			1.0		3.0		3.0		3.0
Table 5. Alternatives Table (Cont'd)

Criteria	Question	Backup Intake	Feasibility	Interconnect	Feasibility	Treated Water Storage	Feasibility	Raw Water Storage	Feasibility
Aesthetic Impacts	Identify any visual or noise issues caused by the alternative that may affect local land uses?	Intake will be located in a wilderness area; Mitigation will likely be required	2	None identified	3	The storage tank would be a large structure in an area with few comparably sized structures	2	The storage tank would be a large structure in an area with few comparably sized structures	2
	Identify any mitigation measures that will be required to address aesthetic impacts?	Visual screening; wildlife protection	1	None identified	3	None identified	3	None identified	3
Aestl	hetic Impacts-Feasibility Score		1.5		3.0		2.5		2.5
	Identify the potential stakeholders affected by the alternative.	See Stakeholder Sub-schedule	1	See Stakeholder Sub-schedule	2	See Stakeholder Sub- schedule	2	See Stakeholder Sub-schedule	2
Stakeholder Issues	Identify the potential issues with stakeholders for and against the alternative.	See Stakeholder Sub-schedule	1	See Stakeholder Sub-schedule	2	See Stakeholder Sub- schedule	2	See Stakeholder Sub-schedule	2
	Will stakeholder concerns represent a significant barrier to implementation (or assistance) of the alternative?	Possibly from an environmental perspective	1	No	2	No	2	No	2
Stake	holder Issues-Feasibility Score		1.0		2.0		2.0		2.0
Comments		The nearest identified water source is the Cranberry River. The intake would be located just upstream of where the Cranberry meets the Gauley.		Summersville pu Gauley River and affected du contaminatio	lls from the will likely be ıring a n event.	Tank would be located at WT to the high service pu	P site and tie mps.	This alternative co ground water however, a reserv volume could consider	ontemplates storage, oir of similar also be ed.

Table 6. Permitting Sub-Schedule

Permits Required									
Agency	Permit	Backup Intake	Interconnect	Raw Water Storage	Treated Water Storage	Other	Notes		
WV Bureau Public Health	Construction	yes	yes	yes	yes				
USACOE ⁽¹⁾	404 Permit	yes	no	no	no				
Local/State Road Agency	ROW Utilization	yes	yes	no	no				
WV Office of State Historical Preservation Office	Consideration	no	no	Possibility	Possibility				

(1) US Army Corps of Engineers

Application Period Duration									
Agency	AgencyPermitBackup IntakeInterconnectRaw Water S		Raw Water Storage	Treated Water Storage	Other	Notes			
WV Bureau Public Health	Construction	90 days	90 days	90 days	90 days				
USACOE	404 Permit	180 days	NA	NA	NA				
Local/State Road Agency	ROW Utilization	90 days	90 days	NA	NA				
WV Office of State Historical Preservation Office				Unknown; estimate less than a year for an impact determination.					

Application Requirements									
Agency	Permit	Backup Intake	Interconnect	Raw Water Storage	Treated Water Storage	Other	Notes		
WV Bureau Public Health	Construction	Engineers Report; Construction Drawings; Specifications	Engineers Report; Construction Drawings; Specifications	Engineers Report; Construction Drawings; Specifications	Engineers Report; Construction Drawings; Specifications				
USACOE	404 Permit	Construction Drawings; Construction Plan	NA	NA	NA				
Local/State Road Agency	ROW Utilization	Construction Drawings	Construction Drawings	NA	NA				
WV Office of State Historical Preservation Office		NA	NA	An old railroad building is located next to the Site and there are concerns that it may be affected by the storage tank. Note: Also an issue with the proposed WTP expansion.	NA				

Table 6. Permitting Sub-Schedule (Cont'd)

Other Considerations									
Agency	Permit	Backup Intake	Interconnect	Raw Water Storage	Treated Water Storage	Other	Notes		
WV Bureau Public Health	Construction								
USACOE	404 Permit								
Local/State Road Agency	ROW Utilization								
WV Office of State Historical Preservation Office				There may be requirements placed upon the project as a result of the proximity to the building					

Table 7. Stakeholders Sub-Schedule

List concerns for each alternative by stakeholder									
Stakeholder Group	Backup Intake	Interconnect	Raw Water Storage	Treated Water Storage	Other	Notes			
Residential Customers	Cost impacts; Improved protection from contamination	Cost impacts; Improved protection from contamination	Aesthetic concerns; Cost impacts; Improved protection from contamination	Aesthetic concerns; Cost impacts; Improved protection from contamination		Neutral response			
System Owner	Additional operations; Cost impacts	Additional operations; Cost impacts	Additional operations; Cost impacts	Operational issue with storage turnover; Cost impacts		Positive to meet regulations and improve service; Negative for treated water storage			
Industrial/ Commercial Customers	Cost impacts; Improved service and protection from contamination	Cost impacts; Improved service and protection from contamination	Cost impacts; Improved service and protection from contamination	Cost impacts; Improved service and protection from contamination		Neutral to positive response; less sensitive to costs over improved service			
Historical Preservation Groups	NA	None	Concerns about the nature and character of the area in the vicinity of a historic building	Concerns about the nature and character of the area in the vicinity of a historic building		Average to negative response			
Environmental Interest Groups	Concerns about an intake in the Cranberry River adjacent to the Wildlife Management Area	Minor	Minor	Minor		Average to negative response			

CONCLUSIONS

Based on the analysis and findings presented Tetra Tech offers the following conclusions:

- The existing storage in Craigsville is slightly below the 2 day minimum requirement and there are plans to build additional storage in conjunction with the WTP expansion. Based on conversations with Craigsville PWS staff, the existing system storage can provide some benefit in a contamination event provided water users are informed of the event and take precautions to limit usage for the duration of the event.
- Based on the scoring system, raw and treated water storage are the most feasible source water alternatives for the Craigsville PWS with raw water storage the most preferred. Additional information on these alternatives are provided in Figures 2 and 3 and opinions of capital cost are presented in Tables 8 and 9. These two alternatives should be considered for further analysis.



Figure 2. Craigsville PSD Raw Water Storage Conceptual Drawing



Figure 3. Craigsville PSD Treated Water Storage Conceptual Drawing

Facility Description/Capital Cost								
Item	Quantity	Unit	Unit Cost	Total Cost				
Raw Water Ground Storage Tank (3MG)	1	EA	\$2,331,375	\$2,331,375				
Raw Water Transfer Pump	3	EA	\$20,000	\$60,000				
Pre-fab metal pump enclosure	1	EA	\$78,000	\$78,000				
Electrical and Controls	1	LS	10% pumps station costs	\$13,800				
Piping from intake to tank	500	FT \$92		\$46,000				
Piping from tank to WTP	500	FT	\$92	\$46,000				
Sluice Gate	1	EA	\$20,000	\$20,000				
Site Work	1	LS	\$50,000	\$50,000				
			Subtotal	\$2,645,175				
			Contingency @ 30%	\$793,553				
		Eng. Permit, etc. @ 15%		\$396,776				
	Land Acquisition		\$100,436					
	Total Raw Water Storage Capital Costs \$3,9							

Table 8. Raw Water Storage – Opinion of Cost

Table 9. Treated Water Storage: Opinion of Cost

Facility Description/Capital Cost							
Item	Quantity	Unit	Unit Cost	Total Cost			
Finished Water Ground Storage Tank (3MG)	1	EA	\$2,331,375	\$2,331,375			
Finished Water Transfer Pump	3	EA	\$20,000	\$60,000			
Pre-fab metal pump enclosure	1	EA	\$78,000	\$78,000			
Electrical and Controls	1 LS 10% of pump		10% of pump station costs	\$13,800			
Piping from intake to tank	300	FT	\$92	\$27,600			
Piping from tank to WTP	300	FT	\$92	\$27,600			
Sluice Gate	1	EA	\$20,000	\$20,000			
Site Work	1	LS	\$50,000	\$50,000			
			Subtotal	\$2,608,375			
			Contingency @ 30%	\$782,513			
		Eng. Permit, etc. @ 15%		\$391,256			
	Land Acquisition		\$100,436				
	Total Finished Water Storage Capital Costs \$3,882,580						

APPENDIX E. SUPPORTING DOCUMENTATION

E-1. Protection Team Meeting

Date: 9/16/2015

Location: Craigsville PSD Office, Craigsville, WV

Participants:

- On Wednesday September 16, 2015, the Source Water Protection Team for Craigsville PSD met at the PSD office to discuss the draft of the updated Source Water Protection Plan. All required members were in attendance, including chief operator Lundy Bailey, Kris Ward, Gary Robinson, Tim Blake, John Miller, Mike Judy, Chris Farrish, Larry Marshall, and Tetra Tech representative Russell Myers.
- Russell presented the draft plan and mapping information to the team and they discussed the potential contaminants as well as some of their priority sites.
 - The team reported that 911 and the National Guard have been their most reliable sources of fuel during emergencies.
 - The team discussed the wastewater treatment plan that is just upstream of the water treatment plant and how any possible contamination from this site could be avoided.
 - Mike Judy asked about the possibility that he could have access to the PSSC data for emergency response purposes. He is forming a county-wide inventory of hazardous material storage sites and could use the information we received from the DHHR to include in his system.
 - The team discussed the old magnetite plant that is located upstream of the treatment plant, PSSC 16. This could the reason for discoloration of the Gauley River during heavy rains. The site closed down 18-20 years ago, but Lundy is unsure about the extent to which it was cleaned and maintained after it closed. The suggested that the Priorities section be modified to reflect this concern. A potential strategy could be to try to find out who owned the site and how it was cleaned up. If funding was available, they could also set up a source water monitoring site below the old plant to determine whether it is impacting the river.
 - The team suggested that it might be a good idea to investigate past cleanups on other parts of the Gauley and Williams Rivers.
 - The team asked that I check for other bridges throughout the ZCC.
 - Lundy stated that he had stopped giving tours of the treatment plant after Homeland Security advised him to do so.
 - o In the communication plan, their notice for boil water reads "Precautionary Boil Water Notice".
 - o Gary Robinson requested a scanned copy of the protection team sign in sheet.

E-2. List of Regulated Databases

In addition to PSSC that have been identified by the WVBPH and local efforts, water systems should consider data available from regulatory agencies, such as the US Environmental Protection Agency (USEPA) and the WV Department of Environmental Protection (WVDEP). The follow presents examples of regulatory program databases that should be considered.

<u>USEPA</u>

CERCLIS:

The Superfund program was created by the Comprehensive Environmental Response, Compensation, and Liability Act, amended by the Superfund Amendments and Reauthorization Act. The acts established authority for the government to respond to the release/threat of release of hazardous wastes, including cleanup and enforcement actions. Long-term cleanups at National Priority List sites last more than a year while short term /emergency cleanups are usually completed in less than a year. CERCLIS is a database used by the USEPA to track activities conducted under its Superfund program. CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA. Sites are investigated because of a potential for releasing hazardous substances into the environment are added to the CERCLIS inventory. USEPA learns of these sites through notification by the owner, citizen complaints, state and local government identification, and investigations by USEPA programs other than Superfund. Specific information is tracked for each individual site.

NPDES:

The National Pollutant Discharge Elimination System (NPDES) database identifies facilities permitted for the operation of point source discharges to surface waters in accordance with the requirements of Section 402 of the Federal Water Pollution Control Act. Point sources are discrete conveyances such as pipes or man-made ditches. Industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into public waters.

RCRA:

This database has records for all hazardous waste, generators, and transporters as defined by the Resource Conservation Recovery Act (RCRA). Hazardous waste as defined by RCRA is waste material that exhibits ignitability, corrosivity, reactivity, or toxicity. Hazardous waste comes in many shapes and forms. Chemical, metal, and furniture manufacturing are some examples of processes that create hazardous waste. RCRA tightly regulates all hazardous waste from "cradle to grave" (i.e., from manufacture to disposal).

TRI:

The Toxics Release Inventory (TRI) is a publicly available USEPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990.

<u>WVDEP</u>

Abandoned Mine Sites:

Abandoned mine features compiled by the Office of Abandoned Mine Lands and Reclamation (AMLR) of the WVDEP. The AMLR eliminates damage that occurred from mining operations prior to August 3, 1977 and is funded by the AML fund. It corrects hazardous conditions and reclaims abandoned and forfeited mine sites. Typical AML features include high walls, portals, refuse piles, and mining structures such as tipples.



AST:

Above Ground Storage Tanks are regulated by the WVDEP and are subject to specific standards. Any facility using an AST should contact the WVDEP Water and Waste Management office for current requirements and further advice at 304-926-0495 or

http://www.dep.wv.gov/WWE/abovegroundstoragetanks/Pages/default.aspx .

Coal Dams:

Point and polygonal mining related impoundments regulated by the WVDEP Division of Mining and Reclamation (DMR).

LUST:

The WVDEP became the lead agency for administering the Leaking Underground Storage Tank (LUST) Program with the USEPA's authorization in September 1997. Since then, the WVDEP has overseen the cleanup of released regulated substances, primarily petroleum products. Such releases can originate from overfilling, spilling, or leaking tanks and piping. To report a release from an underground storage tank system, contact the Office of Environmental Remediation at 304-238-1220, ext. 3506. After hours releases should be reported to the statewide emergency spill line at 800-642-3074.

Solid Waste Facilities:

Municipal and non-municipal waste landfills and waste transfers stations are regulated by the WVDEP Division of Waste Management.

Oil and Gas Wells:

The Office of Oil and Gas maintains records on active and inactive oil and gas wells. It also manages the Abandoned Well Plugging and Reclamation Program.

UIC:

The Underground Injection Control (UIC) program is designed to ensure that fluids injected underground will not endanger drinking water sources. The Division of Water and Waste Management regulates Class 5 wells. These wells include agriculture drainage wells, improved sinkholes, industrial disposal wells, storm water wells and septic systems that have the capacity to serve 20 or more people. The following state codes address UIC regulations; 47CSR9, 47CSR13 and 47CSR55. The Division of Mining and Reclamation oversees all mining UIC permits.

UST:

The purpose of the Underground Storage Tank (UST) Section is to regulate underground storage tanks that contain petroleum or hazardous substances to determine compliance with state rules and federal regulations. West Virginia has had full program approval from USEPA since February 1988.



Confidentiality Statement

I have reviewed and understand the requirements to maintain PSSC data in a confidential manner (64CSR3). While I may discuss PSSCs in general terms, I understand that I am not permitted to release exact locations, characteristics or quantities of contaminants to the general public.

Craigsville PSD Designees:

Name Signature Date John Millin 9-16-15 MIKE JUDY 9/16/15 Tim Blake la 9-16-15 Lundy C. Bailey 9-16-05 mo Kristing A. Ward 9-16-5 harry Marshall 16-15 91 CHRIS FARRISH 9/16/15 an 9-16-15 Gary Robinson They

TETRA TECH

Do your part to keep contaminants out of our children's source water!



Contaminants

Cleaning Products

Automotive Products

Fuel Oil

Furniture Strippers

Oil-based Paints

Sewage

Lawn and Garden Products

Sediments

Pharmaceuticals

Source Water Links

www.wvdhhr.org/oehs/eed/swap/ www.epa.gov/safewater/index.html www.epa.gov/watersense/ http://orsanco.org

For Kids

www.epa.gov/safewater/kids/index.html www.epa.gov/watersense/kids/index.html www.groundwater.org/kids/



Contacts

WV Department of Health and Human Resources Source Water Assessment and Protection Program 350 Capitol Street, Room 313 Charleston, WV 25301-3713 phone: (304) 558-2981 fax: (304) 558-4322 e-mail: EEDSourceWaterProtection@wv.gov





Prepared by Tetra Tech In cooperation with the WVDHHR Source Water Assessment and Protection Program

Drinking water is essential for life. Learn what you can do to protect your drinking water sources.

Making choices to protect and conserve the source of your drinking water will help keep you, your family, and neighbors safe and healthy now and in the future.



Do Your Part to Protect Source Water

- ✓ Recycle used oil and other automotive products at a service center. Don't pour them on the ground or down storm drains. Storm drains can lead directly to your source water.
- Fix leaks from your automobile and clean up spills.
- Apply fertilizers and pesticides as directed. Consider natural alternatives to chemicals.
- ✓ Don't flush pharmaceuticals.

Dispose by mixing with coffee grounds or kitty litter, sealing in a container, and placing in the trash. Organize a collection day with a pharmacy and local police department.

- Take unwanted household chemical waste, such as cleaners, oils, and paints to proper waste collection sites. Don't dump down your sink, toilet, or storm drains. Consider organizing a collection day in your community.
- Check for leaks at heating fuel tanks and install pads to catch accidental leaks or spills.
- ✓ Report unused water wells to your utility or WVDHHR.
- Inspect your septic system regularly and pump every 5-10 years.



- ✓ Turn off the water when you brush your teeth and take shorter showers.
- Wash full loads of clothes and dishes.
- Don't use your toilet to flush trash.
- ✓ Fix leaking faucets, toilets, and lines. Consider installing toilets, faucets, and appliances designed to save water.
- Water your lawn and garden in the morning. Consider installing a rain barrel at your downspouts to collect rain to water your lawn and garden, instead of using treated water.
- Use native plants in landscape that don't need extra watering. Use mulch to hold moisture.
- Don't let your garden hose run when washing your car.
- Don't panic if you are asked to conserve during a drought. Your utility



Conserving water saves on your monthly bill now. Protecting your source water will save on treatment costs later.

