

WaterSuite Enables Immediate Emergency Response Following Upstream Plane Crash



West Virginia American Water gains efficiency during emergency response case with centralized data and planning.



About West Virginia American Water

West Virginia American Water provides water services to about 577,000 people throughout the state of West Virginia. The company operates eight surface water treatment plants located in five different watersheds throughout the state. Each water treatment plant uses either a reservoir or a river as its source. Treatment has been designed to address the unique water quality profile at each location to ensure that the water delivered to customers meets or exceeds applicable water quality standards.

The Challenge

Water treatment plants are designed to remove the known and commonly occurring contaminants in a water source such as naturally-occurring bacteria.

However, treatment plants are not always prepared to effectively remove contaminants that have been accidentally or suddenly released into the watershed. As such, water utilities may be faced with responding to various contaminants introduced to the water supply. One tool that can help utilities prepare for potential contamination threats that could impact treatment is a Source Water Assessment and Protection Program (SWAPP).

During SWAPP development, utilities should first identify the zones of concern within the watershed. These zones are defined as areas that contribute flow to a stream or groundwater that warrant detailed scrutiny due to their proximity to the water supply source and the source's susceptibility of potential contaminants within that zone. The zones of concern can be determined using a mathematical model that accounts for hydrologic conditions, gradient, and area topography.

The challenge for utilities is not only identifying the zones of concern, but also identifying the potential contaminant sources that may fall within those areas and determining the probability of contamination from each of those sources.

Typically, the industries and facilities that store or handle contaminants are not required to disclose information to local water utilities, which can make it difficult for a utility to determine the risk profile of its supply. However, many industries and facilities are required to acquire permits pertaining to activities that may impact water and the environment. These permits include, among others, stormwater and wastewater discharge, hazardous waste management and disposal, and chemical storage permits.

Accessing information from these state and federal permit sources can be difficult and time consuming.



Screen Image of a Zone of Concern (ZOC) in WaterSuite

Even if a utility has the resources to go through the painstaking task of collecting information from disparate sources, meaningful aggregation of all the information may be an even bigger challenge. There is often so much data that prioritizing the greatest threats within a zone of concern can be difficult. For example, there can be several hundred or more potential sources of contamination within a five-hour travel time of a water supply intake.

Additionally, maintaining up-to-date records such as emergency contacts, inspections, and accurate chemical storage information can be difficult, if not impossible, to manage without a dynamic system of record.

In the case of an emergency, water utility managers need to have quick access to contaminant information to make nimble decisions on treatability, toxicity, and how to sample and analyze for the contaminant in question. Since there are often thousands of different chemical compounds and mixtures in a zone of concern, obtaining this type of information can present a significant challenge.

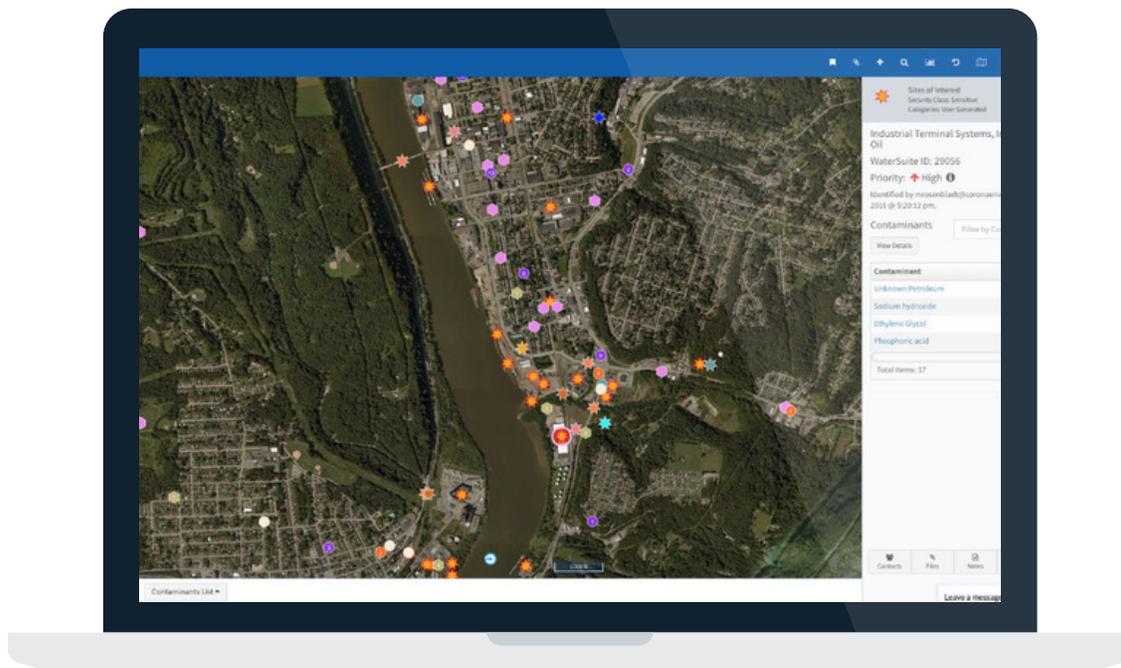
The Solution

To overcome the many aforementioned challenges, American Water partnered with Corona Environmental Consulting and the Water Research Foundation to develop an innovative method for compiling contaminant source information. This dynamic collaboration resulted in the development of WaterSuite.

WaterSuite is a Geographic Information System (GIS) map-based tool that integrates quality controlled data about potential sources of contamination from state, federal, and local sources.

This cloud-based platform provides water utility managers an aerial view of the zones of concern and allows data layers that contain various potential sources of contamination to be displayed and further analyzed. This information can be updated on a regular basis to include the latest information available and has dynamic search and reporting capabilities.

WaterSuite further provides the ability to immediately retrieve important information on more than 1,400 contaminants and their prevalence within the zones of concern. It also provides the ability to immediately view real-time sensor data from monitoring locations that are situated within the watershed.



Screen Image of WaterSuite's Source Water Protection Module

West Virginia American Water utilizes the WaterSuite platform to support implementation of its Source Water Protection Plans, which assist the utility in identifying and managing potential threats that could impact water quality.

Advanced planning and preparation allows the utility to better respond to a source water contamination incident should one occur, and also enables the utility to engage with facilities and businesses to mitigate potential risks to the water supply.

Utilizing WaterSuite in a Potential Contamination Event

On May 5, 2017, a cargo plane crashed in a wooded area near the airport in Charleston, West Virginia, which is located approximately two miles upstream of the intake for the Kanawha Valley Water Treatment Plant on the Elk River. The Elk River watershed covers an area of approximately 1,500 square miles in central West Virginia and drains to the Kanawha River, a major tributary of the Ohio River. The Kanawha Valley Water Treatment Plant has a rated capacity of 50 million gallons per day (MGD) and serves over 200,000 people in portions of nine counties.

West Virginia American Water utilized WaterSuite in response to the event to visually assess the area, review existing permits and safety data sheets associated with the airport, and access contact information.

The team identified the approximate location of the crash site in WaterSuite and evaluated potential routes such as drainage ditches and runoff areas that any spilled fuel from the plane could possibly enter the Elk River. Using this information, utility staff collected samples for analysis of fuel components above and below absorbent booms along drainages near the crash site as well as at the drinking water intake, and marked the sample locations in real-time in WaterSuite.

Since the airport had already been identified as a potential source of contamination upstream of the intake, staff was able to quickly access information related to jet fuel and the requirements for sampling, analysis, and treatment.

West Virginia American Water continued monitoring until the crash site had been remediated. Fortunately, the utility was prepared to respond to the situation and there were no impacts to the water supply due to this event. The tools and information in WaterSuite proved valuable in responding to this type of event in real-time.

THE RESULTS

WaterSuite helped American Water to :

- Quickly access data related to the crash site
- Identify potential routes where any spilled fuel could possibly enter
- Mark sample locations in real-time within the platform
- Retrieve chemical information related to jet fuel and the requirements for sampling, analysis and treatment

For more information, visit us at:

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