

Ken Bousfield Announces His Retirement from the Division of Drinking Water

After more than 40 years of service with the Utah State Division of Drinking Water and its predecessor agencies Ken Bousfield is retiring. His last day of work will be on December 30, 2016. The characterization of his career is best described by the Division's mission statement that Ken modified upon his appointment to the Director position in 2006. That mission statement reads as follows: "Cooperatively work with drinking water professionals and the public to ensure a safe and reliable supply of drinking water". "Drinking water professionals" include: a) the water system operators and managers, b) engineering consultants, and c) technical assistance providers, including: the Rural Water Association of Utah, the Intermountain Section of the American Water Works Association, and local health departments. The following are examples of ideas Ken implemented that demonstrate his commitment to the Division's mission.

There are currently 1,027 public drinking water systems in the State. There are 88 contaminants that are routinely tested to validate that the water is safe to drink. The specific monitoring requirements are based on the following issues: 1) the type of water system, 2) the types of water sources, 3) the type of treatment applied, 4) past water quality tests results, 5) the likelihood of the result changing over time, 6) the potential sources of contamination, 7) the population served, and 8) construction materials used within the distribution system. Ken developed the initial tracking system for these issues and mailed out the resulting monitoring schedules to water utilities to ensure that proper testing of drinking water quality was performed. Currently the monitoring schedules are available on-line (<https://waterlink.utah.gov/deqWater/>) for use by water utilities and technical assistant providers.

In addition to tracking water quality and monitoring, the Division also reviews engineering construction plans to ensure the safety and reliability of the water supply, performs on-site inspections of current infrastructure to ensure that there is no vulnerabilities to contamination, trains and certifies water system operators, and encourages water systems to properly protect the watershed of sources used for drinking water. To cover these issues, Ken developed a tracking system to account for all these additional responsibilities. He did this using a "report card" type tracking approach that was based on a numeric score of each potential violation. The specific score assigned for each violation was ranked, based on its significance to public health. As a result, each public drinking water system has a numeric score associated with it. Water systems, like golfers, are encouraged to have a low score. The State Rule encompassing this scoring system is called: "The Improvement Priority System" or IPS with its associated report. This IPS report is now also available on-line at: (<https://waterlink.utah.gov/deqWater/>). With this information readily available most water systems take it seriously and diligently work on resolving the identified issues.

A third area of contribution that Ken conceived and implemented is the Hydraulic Modeling Rule. This rule focuses on the expansion of water systems that are required to serve a growing population. When new water lines are added to distribution systems, the physics of water flow

through a network of piping will result in one of two possible outcomes: 1) the newly served homes and facilities will essentially rob water from existing customers, or 2) the water use by existing customers will limit the amount of water available to new water users. In the 70's computer based software was developed enabling engineers to make accurate determinations of pressures and flow rates within very complex piping networks. It is an iterative process which starts with assumptions of flows and then it calculates the energy loss associated with those flows. In a water distribution network there are multiple pathways that connect a designated point A with another designated point B, particularly if points A and B are fairly far away from each other. The software calculates the energy loss for every pathway and stops its iterations when the energy level at each pipe junction is calculated at the same level regardless of the pathway. A pipe junction is a place where three or more pipes connect similar to streets connecting at a four street intersection or a three street intersection.

There have been many enhancements to the software and it is readily available to engineering consultants involved in water distribution design. The Hydraulic Modeling Rule requires the design engineer to perform the analysis and certify that basic capacity and pressure requirements are met through the entire distribution system. Along with the certification some basic information about the Hydraulic Modeling results are submitted to the Division for review. This approach is literally a cooperative effort between the Division and a segment of the State's drinking water professionals to ensure that a reliable supply of water is available to all water users served by their public water systems.

In addition to the above noted contributions, Ken and his colleagues within the Division have implemented many improvements over the last 40 years. A significant factor promoting the need for improvements is associated with the Federal Safe Drinking Water Act (SDWA). This Act requires the Division to adopt and enforce a corresponding State Rule for every regulation that EPA adopts. In the past 30 years, EPA has adopted 27 new regulations. The Division has adopted and implemented a corresponding rule for each of these regulations. The Division has done this, without always having a corresponding increase in funding. Thus requiring the Division to implement cost and time saving ideas.

By way of background, Ken grew up in Los Angeles and graduated from University High School. Siting in a chemistry class in High School a month before his 16th birthday, he evaluated his skills and abilities in the context of what profession he should pursue. Because he was very good at math he made the conscious decision to pursue an engineering degree. Specifically he chose the Civil Engineering pathway. He enrolled as a freshman at BYU and earned his degree. He is a Registered Professional Engineer in the state of Utah. While being born in Los Angeles, he does have Utah roots as one of his ancestors, Charles Shumway, was part of the original company arriving in the Salt Lake valley in July 1847. Charles Shumway arrived in the valley, along with others on July 22nd and was part of the crew that diverted water from City Creek canyon into Pioneer Park.