Water Incident Report
September 13 through October 2, 2019
Sallal Water Association

What Occurred: A water test sample collected from the Riverpoint area of the Sallal Water distribution system tested positive for E. coli on Friday, September 13. Additional samples were collected the same day to eliminate the possibility of a false positive for E. coli presence. One sample came back positive for E.coli, the other sample was satisfactory. The Department of Health (DOH) was notified on Monday, September 16 of the presence of E.coli in the water system and provided guidance to the staff and Board of Trustees throughout the event. These results prompted testing in other zones of the water distribution system while the residents of the Riverpoint area were advised to boil water for drinking and cooking purposes.

As testing continued, other zones returned positive test results for coliform bacteria and E. coli. On Wednesday, September 18, the entire Sallal Water distribution system was placed on a Boil Water Advisory. Further testing results on Friday, September 20th, showed that E. coli was found in Well #2 which was immediately taken offline. Sallal staff worked long hours and weekends to manually chlorinate the system and continue sampling water. Automatic chlorination systems were installed on both wells by Wednesday, September 25, and fully automatic chlorination began on Thursday, September 26.

Sallal employees followed the health regulations and laws carefully to ensure the safety of the Sallal water system. DOH also informed the staff and Board that sources of E. coli in deep wells are difficult to determine and advised Sallal to focus on removing coliform bacteria and E.coli from the system.

On the afternoon of Wednesday, October 2, the Boil Water Advisory was lifted as water samples were then testing negative for coliform bacteria or E. coli in the system. Members were advised to flush home systems with the treated chlorinated water before consuming water for drinking and cooking.

On-going Efforts: Sallal staff continued to monitor the presence of chlorine in the water to reduce the chlorine injection amounts down to maintenance levels over the next several weeks. Several solutions are under consideration for ongoing water disinfection as it will take a minimum of a year before the DOH will approve the water distribution system to go back to untreated water. In the meantime, Sallal staff are working to bring Well #2 back online by April or May, when demands for water typically increase.

Future Planning: Sallal must continue to maintain a chlorine residual in the water distribution system until such time that DOH allows untreated water back through the system. Well #2 will need to be modified such that water must have at least 6 minutes of contact with chlorine before the water reaches the first member's property. This will likely require the replacement of or addition to existing water mains near the well. Several scenarios on how this will be accomplished are under consideration. Continued disinfection will be needed throughout this year and into next year until DOH is satisfied that

Sallal water is safe to drink without treatment. A disinfection plan will be developed in the next few months to comply with DOH requirements andto bring Well #2 back online.

Disinfection Strategies: Three main strategies for water disinfection are currently approved by DOH for drinking water systems. They include chlorination, ultraviolet light, and ozone. Each of these are explained below as are the effectiveness of each strategy.

- Chlorine is currently being used to disinfect the Sallal water distribution system. Concentrations as low as 0.2 milligrams per liter of water are the minimum required by DOH. However, the concentration of chlorine will vary throughout the system due to the flow of water throughout the system.
- Ultraviolet Light is used in water disinfection systems to kill the DNA in cells of bacteria and viruses. Unfortunately, ultraviolet light does not provide residual disinfection throughout the system so chlorine will still need to be used in the system.
- Ozone disinfection requires an onsite compressor and cleaning system to draw ozone from the air or a delivery system of liquefied oxygen to the site. Again, a chlorination system would still be required to maintain the residual chlorine in the system.

Selecting which strategy to use will be based on space for additional equipment, cost of site preparation, construction and installation of equipment, as well as ongoing operation and supply costs. At this time estimates run from $573,000 to $830,000 for site preparation, construction, and equipment with chlorine as the least expensive to ozone as the most expensive. Ongoing costs are not included. Chlorine will still be needed if ultraviolet or ozone treatments are selected and approved.

The Sallal Board of Trustees will inform the Sallal Membership of the effectiveness and final estimates of each solution after further investigation of each disinfection strategy is completed. The Board will ask the membership for input once the information on each strategy is shared.