

5-13-2024

Marilyn Parker

Mayor

Tellico Plains

RE: After Action Report water outage 5-9 thru 5-11

Mayor Parker:

This report documents the actions of the water department during the water outage and boil water advisory we recently experienced. I feel it is important to document the events and how we dealt with them to learn as much as possible for the future and provide the public with the facts as to why they were out of water during this event.

Storms passed through the area the night of Wednesday the 8th and the morning of the 9th. Lightning disabled the tank level sensor at Mt. Vernon Tank. Data indicates the tank signal spiked at 11p.m. on the 8th then appears to start returning to normal until signal was lost completely at 6:42 a.m. on the 9th. It appeared this was the only real issue from the storms early in the day on the 9th. Staff went to Mt. Vernon to replace the pressure transducer and signal was restored at 1:50 p.m. but the replacement board had a voltage leak leading to erroneous tank readings. Ultimately the board from Hooper pump station had to be removed and placed at Mt. Vernon to get correct tank levels at Mt. Vernon which occurred on the 10th at 10 a.m. It is more important to have communication with Mt. Vernon as it controls the Rural Vale Plant.

Duckhead and Save-a-lot tanks started dropping at 12 p.m. on the 9th but the rate of decline drastically increased an hour later at 1 p.m. I was in communication with Cody Deby, Robert Miller, and Jacob Stewart multiple times between 2 and 5 p.m. trying to determine where such a large leak could be causing the tanks to deplete so quickly. All Staff were actively looking for the leak but it was very difficult to find the leak as significant rainfall had occurred the night and morning before so water was pooled in multiple locations.

I arrived on site at 7 p.m. on the 9th. Cody Deby had closed a valve which feed Duckhead and Staff were at a valve beside Tellicafe and closed it when I arrived. With these valves closed Staff believed all of town plants water should be directed to Sav-a-lot tank. Town Plant was running two high service pumps at this time but no water was making it into Sav-a-lot tank. I previously emailed Mayor Parker an example boil water advisory and we spoke around 8 p.m. and I advised to issue the boil advisory.

I directed the valves at Bank street on the line leaving the plant to be closed to determine if the leak was between the plant and bank street. These valves were closed and no increase in pressure at town plant was observed which indicated the leak was between town plant and bank street. A ditch behind the community center had significant water but we could not determine if it was surface runoff or city water. Six valves were identified behind the community center between the plant and bank street. I made the decision we had to dig around these valves to determine if the leak was at one of the valves. 811 had to be called before we could dig and they arrived around 10:30 as best as I can recall. We closed a series of valves around the plant and the six valves behind the community center and determined one of the six valves behind the community center went to a line causing the leak. With the other valves on bank st closed pressures ramped up quickly at town plant indicating this line was the cause of the leak. This Valve was closed and the valve to Sav-a-lot was opened at 1:40 a.m. and Sav-a-lot started filing as it should. The valve to duckhead was opened at 2:30 a.m. and it started gaining water.

The Map does not show this line behind the community center and no one on staff knew this line existed. At the time this line was located, the direction was straight toward the creek at approximately Volunteer Federal's bank building if it went across the open field beside Tellicafe. We were unsure if the rain had caused the line to break in the creek or if it was broken somewhere in the open field or on the other side of the creek.

Robert Miller had been in communication with the school system as they were unsure if school could be held on the 10th. With the leak valved off and town tanks filing the priority was to keep water in Sav-a-lot and Duckhead tanks as they feed the High School and elementary schools in town. Robert communicated with the school system around 5 a.m. and let them know school could be held. Rob Hamilton was dispatched to collect chlorine readings at all of the affected schools around 7 a.m. and all readings were above 1.0 mg/L.

At 5:30 we opened the valve beside Tellicafe but this caused Save-a-lot to start losing water again and the valve was shut again at 6 a.m. and Save-a-lot starting gaining. This indicated we were not only losing water through the line behind the community center but also the line beside Tellicafe. Several options were considered. Was this a separate leak which occurred at the same time, was the line behind the plant connected to this line before the creek, was it connected on the other side of the creek. The Map does not show where this line goes. It shows it ending in the field just down from the Tellicafe.

At the same time all of this was occurring with the Town side of the system, Robert who had the City phone started getting calls from the Reliance area saying they didn't have pressure. The Contractors working on line replacements had a new line in this area and Jacob Stewart, who is the primary contact for the contractors, was dispatched to determine if this line replacement was the cause of the low pressures in Reliance. Jacob could not find an issue with the new line when he first went in the early morning

hours. Robert Miller once it got daylight went back out to this area and determined it was the contractor line which had caused the low pressure in Reliance and valved the leak off. The Contractors were notified and told this leak was their responsibility to repair.

At 12:40 p.m. on the 10th Save-a-lot tank was valved off from the system with around 19 ft in the tank at this time Duckhead had around 41 ft. We were attempting to restore water to the main part of Tellico and needed to open the line at Tellicafe. We knew Sav-a-lot would drain quickly if not valved off and were attempting to keep the Tank from draining again. With the Tellicafe line off some areas of town had water but significant areas did not. We were still working under the premise the Tellicafe line was connected in some way to the line behind the community center at this point. Duckhead dropped as would be expected but a lot of customers were restored with this line opened back up. Water was returning to Hooper pump station with this line back on.

We returned to the line behind the community center to try and determine exactly where it was going to find where it was leaking. Water was present in the field in several locations in a straight line from what we had uncovered next to the valves at the community center. Rob Hamilton and Carter Harris checked the water and got a small amount of chlorine residual which would indicate city water. I decided to have Robert dig a test pit but we quickly determined this fill material was heavy in clay and the water pooling was likely surface water. At this time a former employee, Chuck Wilke arrived and informed us the line leaking behind the community center went toward the wellfield but he was unsure of its exact location after that. We dug more of the line at the valve up in an attempt to determine where exactly it turned but this effort was ended as it was clear the time it would take would be too long to be useful.

We had water to the Hwy 360 bridge but couldn't get Ballplay pump station or Rafter pump station supplied. We checked and rechecked valves in the area. In the morning on the 9th Staff had to pull debris out of the creek at Stokley's. With the info from the former employee that the leaking line went in that direction I decided to go to Stokley's to evaluate if the line could have been damaged during the debris removal. Nothing was apparent from visible inspection. Jacob Stewart suggested we could ask Jake Harris if he had water at Stokely's. We went and spoke to Mr. Harris and he informed us he had water but it wasn't normal pressure or flow. I explained the line behind the community center and that it was valved off. Mr. Harris knew exactly where this line went and showed us several valves. We were then able to valve the line off next to Stokely's and open the valve behind the community center and pressures held. Cody Deby started tracing the line and closing valves with the help of another former employee, Ken Powers, and ultimately we found a valve leading to a field next to the creek open which was the cause of the leak. The valve was closed around 5:30 and duckhead tank started gaining rapidly at this time. Sav-a-lot was opened at this same time as well. Enough water was at Ballplay pumpstation for it to be returned to service at 8:30 on the 10th.

I spoke with Mayor Parker around 7p.m. on the 10th and advised the boil water advisory could be lifted to all areas of the system except the ballplay area on Hwy 360 and we expected tomorrow for ballplay to have enough water to lift the advisory in that area. Bacteria samples were collected throughout the system on the 10th and the 11th. All results have been reported and are negative.

At midnight between the 10th and 11th the high service pump at rural vale shorted across the main electrical bus disabling production at Rural Vale. The other pump was started at 7:30 a.m. but this pump would only produce 200-250 GPM which would not keep the tank full. We had a pump ordered to replace this pump and it had to be installed to keep production up at Rural Vale. The pump and housing had to be replaced which is a much larger operation than just replacing the pump stack kit. It had previously been determined previous repairs on the pump stack kits at Rural Vale were not entirely correct. The pump manufacturer had discontinued the exact model in use at Rural Vale and the new pump required a new housing. Staff were able to get the new pump running around 4 p.m. on the 11th.

The wire sizing between the pump breakers and the main breaker was determined to be undersized which caused the pump to shortout on the 11th. On the 13th the wiring was replaced with the correct size wire and both pumps are operational at Rural Vale. We do have another pump and housing ordered to replace the pump with the remaining old housing.

It has been a trying few days to say the least. I am very thankful to all of our Staff, the City Council, Charlie Wilke, Ken Powers, and Mr. Harris. I gained a lot of knowledge about the system during this event and I'm certain staff also learned a lot. I feel we went through a logical progression of problem solving during this event to find the leak and ultimately resolve it. I sympathize with customers affected and we will learn from this event to improve operations. We had already identified the maps as a major concern and the engineers have mapping in their plans with some of the grant funding we are looking to receive. At this point I feel we should dedicate staff time to improve the mapping of lines in town instead of waiting on engineering and grant funding.

Sincerely,

Troy D. Taubert

Roaring River Consulting