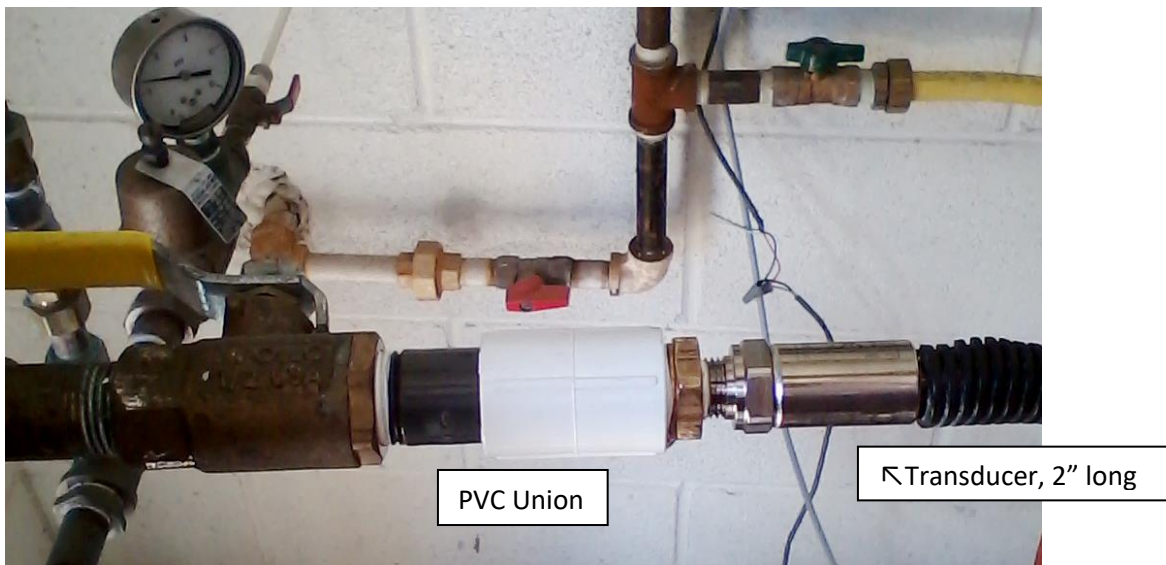


**Lightning Issues:** While I was away during July I watched the Woodland Park weather and the Water Plant closely. Electrical storms have taken their toll on our automation electronics in the past; Teller County I'm told is where Tesla did lightning research! But, having replaced the copper wires we had in the ground out between the Water Plant and the Wells and the tank with fiberoptic lines, having replaced RS232 direct connections between automation components with Ethernet communications, having replaced the Well#9 level sensor with a phonematic level indicator and thereby eliminating those copper wires between the Water Plant and the Wells; and, by having taken other measures to isolate the equipment from IREA and lightning induced power spikes we have significantly reduced the damage. Nevertheless, there were two minor incidents while I was away, the first was the Water Plant PC and the Data Logger were 'knocked out' – a technical term. I contacted Andy who stopped by the Water Plant to reboot the PC and the Data Logger, problems solved. While returning home, a storm froze the C-More display software. This software ports the PLC's HMI (Human Machine Interface) to the Water Plant PC so pumps etc. can be operated remotely. I rebooted the software



from a hotel room. Then on Wednesday, the 23<sup>rd</sup> we had a terrific electrical storm and that took out a pressure transducer used to display the water pressure of the distribution system at the plant and for operating Well#9 so as to maintain a set pressure when all or a portion of the distribution system is disconnected from the tank by a water main break or for maintenance. It has become rare to lose one of these now. But In the past, before the measures mentioned were taken, we lost at least one of these annually. As a further precaution, I inserted PVC pipe fittings to provide some isolation. Otherwise, this transducer is connected to the 250' long, 24" diameter Ductal Iron pipe that is our Chlorine contact chamber. This pipeline lies out in the field in front of the Treatment building, a target for lightning strikes. While Dan is doubtful the PVC pipe will help he indicated that there is at least one more measure he will take to further minimize this risk.

In any case, all bets are off when we have another direct hit as we had two years back at Wells #9 & 11a.

**Alarm Notification Software:** On the 7<sup>th</sup>, I uninstalled our Alarm Notification software and installed an upgrade undertaken after testing during 2011 ~ 2012. Jeremy and an associate made some recommendations during those tests that warranted the upgrades. Unfortunately, the upgrade got tabled as we began drilling new water mains in the Southern Systems and I was on the work sites daily. The Notification software had been designed to pole the PLC for alarm conditions by a RS232 cable. While upgrading our electronics has been very beneficial the move to networking the automation components has derailed this software. After a great deal of discussion between the parties involved, Dan, Sayeh and myself, the fix has been determined and it is in the works.

**District As-Built Maps:** For over a period of at least 3 years I have searched for free or inexpensive software I could use to prepare as-built maps of our distribution system. Ultimately, I settled on using Google maps to draw measured water mains and then Photoshop to insert hydrants, valves etc. The first map which I sent out took a huge amount of time but I hope each additional map will go more quickly. Does anyone know how to draw two separate measured lines on a Google map? That would be very helpful later on.

**Sunnywood Hydrant #9:** During the Sunnywood water main break early this year Chance found hydrant #9 was full of ice, in other words, either the flow valve was leaking or the weep valve failed to drain the hydrant, or both were defective. As a hydrant flow valve is opened a “weep” valve at the bottom of the hydrant is closed. As the flow valve is closed the weep valve opens to drain the water trapped in the body of the hydrant. Bob Clodfelter and I worked the hydrant valve and then left it partially open but with the caps on in the hope that the weep valve might open under pressure. I returned after 2 hours and closed the hydrant flow valve. I return the next day but found the hydrant still full of water. I worked the valves a third time without success. This hydrant should be replaced as soon as possible. It is otherwise working but will freeze solid during the winter.

**Tank Ladder:** The ladder in the tank vault does not extend above the mezzanine floor making it difficult to descend or extricate oneself from the lower level. I assumed that Melanie had made a mistake but evidently that’s a common problem and Bob had the common fix in his garage. He brought that last week. It is a spring-loaded extension that can be brought up above the mezzanine to aid access and egress. The support can be pushed below the floor so the hatch can be shut.

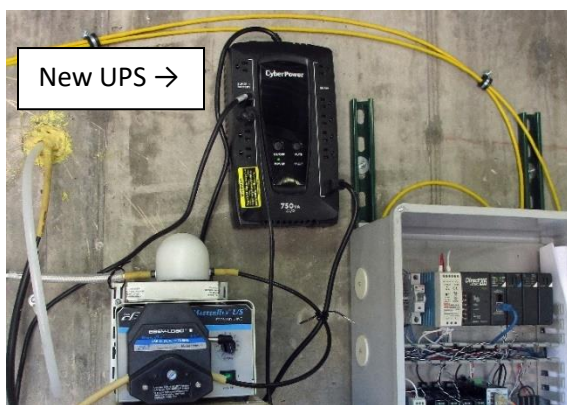




Thanks Bob!

**Church Office Leak & Backflow Prevention Device:** The Community Church on Valley View has two water taps, one for the Church building and the other for a small building between the Church and the office, the office building has a City tap and the Church hydrants are also City property. The leak was located in open ground between the office parking lot and the ditch by Valley View. I phoned Rusty, a City water operator. As the office water tap exits the back/north side of the office and heads west they reckoned the “leak” was from a French drain heading southwest from the Church. I took the opportunity to ask if the Church building has a backflow prevention device after its water meter. Of course, no one knew. We investigated and found they had what appeared to be the proper device. I explained that we will have to determine that their unit is code compliant and they will soon be required to have this device checked annually. I further explained that we will arrange the inspections so as to minimize our mutual costs.

**Tank Uninterruptable Power Supply:** The tank vault can become humid during the summer and as such some condensation fell on the UPS that backs up the electronics there including the tank level sensor. When the UPS went out that took out the level sensor and shutdown the pump. I got a multi outlet surge protected power strip from home and had the system equipment back on-line. I ordered a new UPS and I installed it on Tuesday the 22<sup>nd</sup>. See the photo on the left.



During the summer, the tank should be inspected at least twice a month for excessive moisture – it should also be inspected to see if the rubber hose in the peristaltic pump needs replacing. I have installed a large blower which will dry the floor in about an hour. In the photo above you can see water on the floor at the foot of the ladder. This photo was taken after installing the UPS while running the blower.

Incidentally, the 4” blue pipe was installed to flow water from our wells into the tank from the top so as to create a circulation and flow through the tank to the exit near the floor. The design assumed we would install a 4” line from the Water Plant to the tank for all water production. Further it was assumed that this 4” line could be drilled together with a new 8” water main from

the tank to the vicinity of the Water Plant where it would feed the existing 6” line to Navajo Tr. in the Southern System. Ultimately these plans proved to be too expensive. With the plumbing in the tank vault in-place we began thinking about how to achieve our objectives without the benefit of the dedicated 4” production line. With help from Treatment Tech



and others we developed a simple plan to modify this plumbing to do just that. And thereby freeing up an 8" pressure regulating valve we could use for a new 6" connection to the City main in Piute Tr.

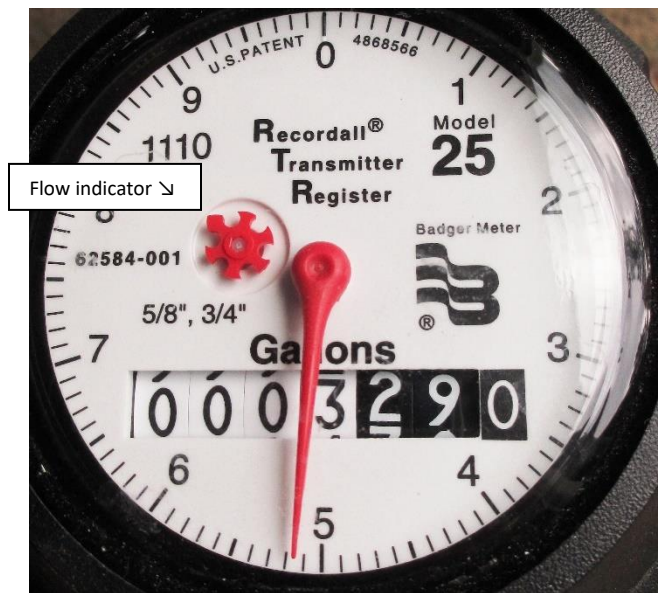
**Clean Decomposed Granite:** In the morning of the 18<sup>th</sup> I got a call from Carlos of Global Underground, could we use some clean decomposed granite/gravel? They had two loads of potholing DG from work up the road. Yes, we had a low spot in the driveway by the Water Plant customers use to pay their bills. When they dumped their loads, I had them vac the valve box on the 8" line that goes East from in front of the Water Plant to the 6" Line which goes on to Navajo Tr. This valve box was accidentally hit by a Global truck when dumping dirt on the last day of work for us several years ago. They cleaned the valve box as far as possible but they were unable to get to the bottom and thought the valve pipe will have to be excavated. We can get this done at a later date as we have a working valve on this line where it enters Navajo Tr.

**Setting Priorities:** I was invited to join a discussion about setting priorities. The participants included Jeff and Jim from Treatment Tech, Caryl and Fritz chaired the discussion. When asked what priorities Treatment Tech would recommend, Jeff advised replacing our meters, their experience has been that we would likely see a significant increase in revenues as old mechanical meters tend to under count usage over time. I was thinking that we had replaced our meters on Dave Stanford's recommendation during 2005. Actually, that took place during 2006 hence our meters are only 11 years old. We had high expectations of greater revenues from that very substantial cost, unfortunately we didn't see that or any significant even detectable decrease in our water losses. After the meeting, I phoned Rod Herk who replaced most of those meters and installed the Hexagram telemetry system. He confirmed that all of the meters were replaced at that time, to the best of his knowledge. David (Jr.) Stanford also replaced some meters and installed Hexagrams.

What could account for the minimal improvement we saw. Certainly, our very clean, bag and GAC filtered water is probably a significant factor. After my meter was replaced late 2006 I dismantled it. It was amazingly clean. I even took it to a board meeting to show the other members. I think this meter was the original and nearly 30 years old, it was old but I can't be sure it was that old. Of the meters I have repaired, the failures have all been the result of dirt and/or iron particles from service line issues.

On the weekend, I resolved the not-reporting Hexagram issue at 1501 Chippewa, a wiring fault. As the house in under renovation and there were no outside taps I had to disconnect a humidifier supply line to see if the meter was working. With just a dribble of water flowing from that 1/4" tube I could see the meter's flow indicator, see meter display, turning very slowly. Our Badger 25 and AMCO (Honeywell) C-700 meters are oscillating piston type positive displacement water meters. Each piston revolution in the meter's measuring chamber is equivalent to a known volume of water. While the piston can be jammed by particles of rust or gravel it otherwise turns freely lubricated by the flow of water through the chamber.

At this point while writing I got a phone call and access to 755 #3 Apache, one of the condos at 67, so I went to fix that meter. The meter was working OK even with just a slight trickle of water from a faucet, the flow indicator turned smoothly. The problem was a wiring issue. After the repair, the programming tool reported the current meter reading and it should begin reporting the reads twice daily to Pathway Reads our water data service provider.



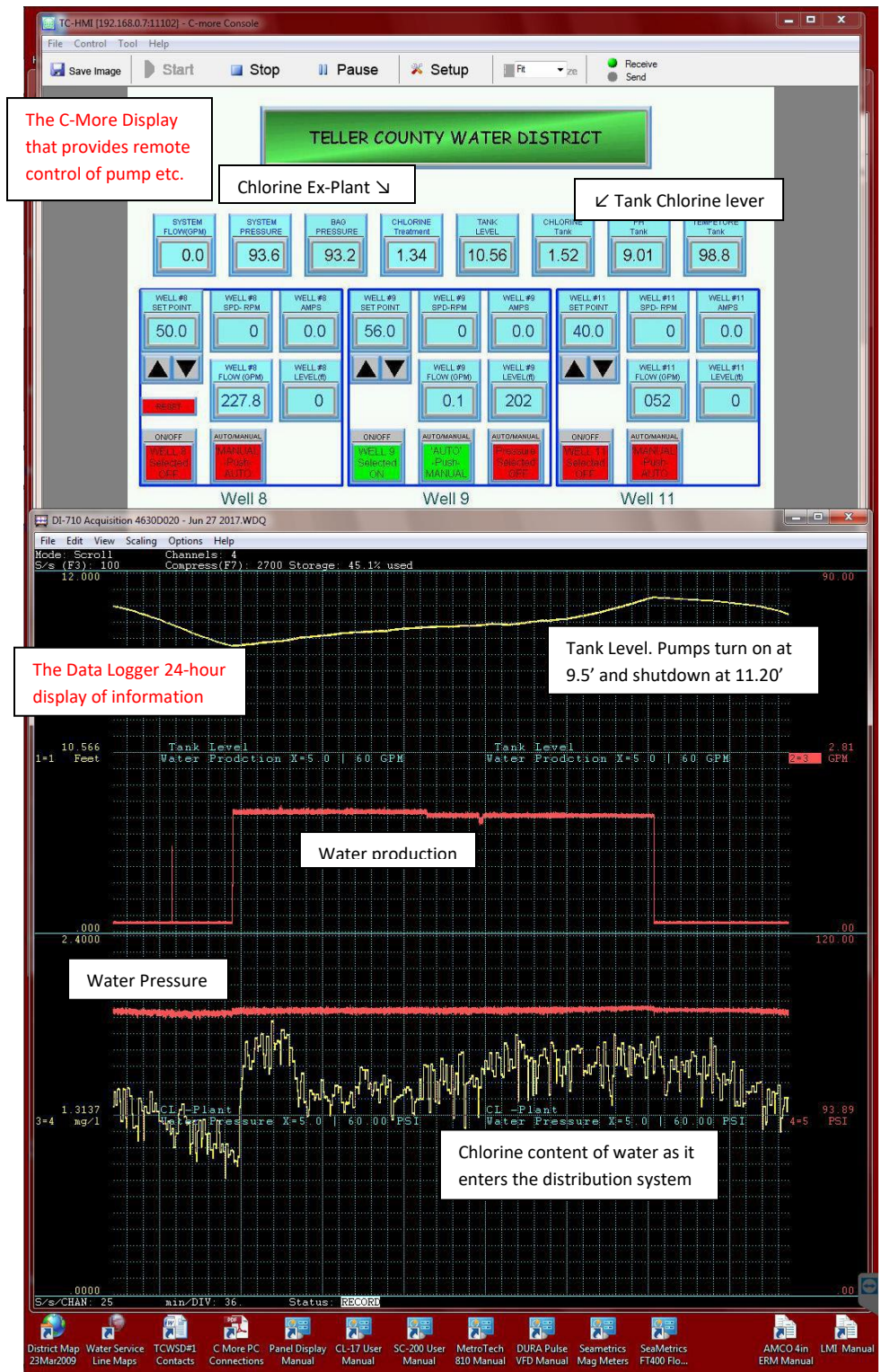


Jeff didn't say how old the meters were where they saw a significant improvement in revenues by replacing the meters. I do not think we would see any significant improvement while incurring a very significant cost that can be deferred several years. To address this issue directly we can remove some water meters and have then tested for accuracy.

Meanwhile the new technology meters are providing more useful data such as very low-level flows that can indicate a leaking toilet, or back flows during the night that can indicate service line and even water main leaks. Pathway Reads is working on enhancements that will provide homeowner access to their meter reads and historical usage data. There is certainly no reason in my opinion to rush into an expensive meter replacement program at this time.

Jeff also expressed interest in having remote access to our Water Plant. We have had that for about 9 years. The first step was remote access to the water production, tank level and other data. As soon as we had that information on the PC monitor I researched remote access software and settled on LogMeIn. I'm not sure if I introduced this program to Jeremy or if he was already familiar with it. I do know he used the program early on to view the streaming data on our PC.

Dan had chosen Automation Direct components for our system. While these are reliable components they are at the low end of the cost curve. As such, they were probably several years behind other component makers such as GE, Siemens, and Rockwell, Wikipedia lists over 40 makers, in providing direct remote control or in porting system controls to PC for remote control. Sayeh, our software engineer, discovered Automation Direct offered "C-More" software that ported the HMI to the PC and Dan had that up and working by 2011 I think and of course we let Jeremy know immediately. By that time, we switched to TeamViewer for remote access because LogMeIn had discontinued a free service. With the C-More software our operators have extensive control of our system and 24 hours of production, tank level and other data presented graphically. Above is what they will see when they login.



Across the bottom of the screen are the manuals to all of our equipment, our service line maps, general and contact file information and other key resources.

After our meeting, I showed Jeff and Jim what they can do remotely either by using TeamViewer or other remote access software. I am sure Fritz would prefer he address the other issues that were discussed at that meeting.

Kent Brady, Project Manager