AGM 2023 - Water Commissioner's Detailed Report

Overview of 2022

During 2022, both of the Asociacion's active wells experienced some problems. The pump in the La Huerta well failed suddenly and it became necessary to remove it for inspection. There was a significant delay in sourcing a well services company that could complete the work and after an extensive search a contractor from Guadalajara was found. A new pump and riser was installed and the performance results since installation have been very positive to date. The La Calma well performance degraded continually over the year showing a significant decrease in pumping efficiency (amount of water delivered per kWhr. of power consumption) and flow rate (liters per second). At year end it was not yet known the cause of the problem as it could be a number of things. Early in 2023 will contract with a well services company to remove the pump and inspect all components and the well casing.

During the year, significant progress with the rebuild of the *"Distribution System"* in La Huerta was completed. The final phase of the project, the relocation of water lines and the rough-in for the new water meter locations along Calle Camino Real, was completed. The large cistern under the garage area at Casa Loop's was cleaned and the outlets modified to accommodate greater flow. Work began at the Camino Real pozo site to support the installation of a new storage tank with automated level control and a tank monitoring system. The final work to complete the project is scheduled for early 2023

The on-going access issue via the servidumbre, which is adjacent to the La Calma well site (initiated in 2016), has finally been resolved. There was some progress on this matter during the year to report to the Membership. Due to an Agrarian court decision during the year, the "Mesa Directiva" of Tlachichilco assumed control of the land on which the access servidumbre is located. Your Board of Directors was able to obtain a legal "permission to use" the lower portion and gate in order to access our well site.

Well Performance

How are the wells performing?

The performance of the two active wells is monitored daily throughout the year. A new monitoring system was designed and partially implemented during the year. The objective of the project is to capture and record performance data from each well and storage facility and transmit it to a common site for alert notification and post-event analysis. Specifically for the active wells, the system provides a higher degree of accuracy (over manual taking of readings) as well as the ability to monitor the important electrical parameters (voltage, current, etc.) and flow characteristics at each well on a 'near' real-time basis. Following are the main outputs monitored.

1. The **volume of water** pumped.
2. The **amount of electricity** consumed.
3. The **length of time** that the pump runs.

With this data, I am able to calculate two very important performance statistics that tell me how the *"Supply Network"* (well, pump and pipes/tubing that deliver water up to the storage tank) is performing.

1. The pumping **efficiency** is the quantity of water (in cubic meters) that is delivered to the storage tank for each kilowatt hour of electricity consumed. The greater the number, the more "efficient" the *"Delivery Network"* is operating. This factor directly impacts the Asociación's costs to operate the well.
2. The **flow rate** is the quantity of water (in liters) that is pumped and delivered per second to the storage tank. This is an important statistic used to monitor the ongoing performance of the well and pump over time. Consistency from month-to-month over the range of our demand is the performance that is most important thing to watch.

La Calma Well

During 2022, this well supplied a total demand for 7,113 cu. mtrs. with an overall efficiency of .91 cu. mtrs./kWhr. and average flow rate of 2.26 ltrs./sec. Total run time for the pump this year was 873 hours. The demand on the well ranged from a high of approx. 26 cu. mtrs./day during the period from March through May to a low of 10.4 cu. mtrs./day in July.

For comparison purposes, during 2021 the well supplied 10,416 cu. mtrs. with an overall efficiency of 1.09 cu. mtrs. /kWhr. and an average flow rate of 2.71 ltrs. /sec.

As mentioned in the summary, the well performance degraded continually over the course of the year showing a significant decrease in pumping efficiency. During the month of December, the well delivered only .76 cu. mtrs. / kWhr. of power consumption. The Board of Directors has planned and budgeted to contract with a well services company early in 2023 to remove the pump and inspect all components and the well casing now that the Asociacion has vehicle access to the site once again.

As part of the Access Agreement with the Mesa Directiva of Tlachichilco, the Asociacion will assume the maintenance of the lower part of the servidumbre adjacent to the well site entrance. During 2023, we plan to repaint the metal fencing and gates, keep the area clear of vegetation and add a top layer of aggregate to the well site to make access easier for trucks during the rainy season.

La Huerta Well

During 2022, this well supplied a total volume of 11,432 cu. mtrs. with an overall efficiency of 1.55 cu. mtrs./kWhr. and average flow rate of 4.71 ltrs./sec. Total run time for the pump(s) this year was 674 hours. The demand on the well ranged from a high of approx. 48 cu. mtrs./day in May to a low of 12.9 cu. mtrs./day in August. The new pump we installed is of a different brand (Suditra – India) than previously used and has exhibited significantly higher level of performance than the previous pump. Since the installation in June, the new pump has consistently operated with an efficiency of 1.84 cu. mtrs,/ kWhr (a gain of approx.. 25% from the previous average of 1.48) and a flow rate of 7.06 ltrs/ sec. (a gain of 30% from the previous average 5.41).

For comparison purposes, during 2021 the well supplied 12,368* cu. mtrs. with an overall efficiency of 1.42* cu. mtrs./kWhr. and average flow rate of 3.67* ltrs./sec. Note: The data with asterisks is slightly inaccurate due to a defective well water meter (running slow) for at least the last quarter of the year. The master water meter was replaced at the beginning of the year.

The water from this well has a fairly high TDS (Total Dissolved Solids) count which means it is relatively "hard" water. As a result, "*Users"* may note a slight build-up of a reddish "slime" called iron bacteria in their pipes. Periodic testing has shown though that the soluble heavy metals levels are lower than the allowable maximums specified in the Mexican Federal Standard NOM-127-SSA1-1994 for potable water.

Camino Real Well

This well was not operated and it has been many years since it was last used. Word-of-mouth from previous volunteers have said that it did not produce much water when it was in use. I have no information on its current condition or ability to produce any significant amount of water.

Water System Performance Review

What happened with the Supply Network in 2022?

The *"Supply Network"* is the portion of the *"Water System"* that takes water from the wells to the storage tanks.

There developed only one minor leak in the *"Supply Network"* in the La Calma side of the system during the year. Just above Lot 23 on the access roadway near Casa Handy there was a failure due to a small crack in a PVC elbow. A different type of coupling was installed to repair the leak.

There were no problems with the *"Supply Network"* in the La Huerta side of the system during the year.

What happened with the Distribution Network in 2021?

The *"Distribution Network"* is the portion of the *"Water System"* that delivers water from the storage tanks to each Member's property line.

As a guide to detecting possible problems, I compare the pumping volumes from each well to the sum of all of the individual meter readings that are taken at the first of each month. The difference in these numbers is referred to as the "Loss" and can be attributed to one of three possible factors: leaks, metering inaccuracy or theft. This is of particular concern since the *Asociación* has to remit extraction taxes to CONAGUA based on how much water we pump from the wells, not what we use.

During 2022 we "lost" 1,157 cu. mtrs. (3.25 cu. mtrs./day, 10.2% of what was pumped) in the La Huerta branch and 523.74 cu. mtrs. (1.43 cu. mtrs./day, 7.36% of what was pumped) in the La Calma branch. This is a significant improvement from the previous year and the lowest loss figures on record.

For comparison purposes, during 2021, we "lost" 1,708* cu. mtrs. (4.68* cu. mtrs./day) in the La Huerta branch and 2,808 cu. mtrs. (7.69 cu. mtrs./day) in the La Calma branch.

The loss of water is due to a combination of inaccuracies in metering and overall degradation of pipe seals and joints causing small leaks or seepage in the *"Distribution Network"*. The Membership is encouraged to remain vigilant and report any leaks or theft that they become aware of to one of your Board of Directors immediately.

System Improvements

What improvements were done to the system during 2021?

During 2022, a major amount of work was completed on the multi-year improvement of the *"Distribution System"* in La Huerta. Work this year was focused on the Camino Real portion of the upgrade using the funds raised from the Capital Assessment done in early 2022. Following is an explanation of what work was completed and why there were cost overruns. There are several additional work items we either had to or elected to complete during the course of the work we did. Included is also the remaining work that is planned for completion in early 2023.

1. "Lower Camino Real" Section - this portion of the plan went very well as we were able to use an unused 4" PVC line that we found buried along the edge of the Gerenda property. It was originally installed to route dam water down the roadway but was never connected to anything at the lower end. This eliminated the need to dig up about 80 mtrs. of roadway to install our new 2" line.

We need to finish the cement work around the recessed area of the wall where the water meter is located at Casa Miller. The wall cavity there had to be made larger to make room for the new Access Link configuration.

As a change, we decided not to do a rough-in for the two potential new Members on the west side of Camino Real as we have not heard anything further from them. We did decide however to relocate the air bleed valve to that side of the roadway to take advantage of being the highest point in the system. We added a second valve so that there is one on both the "up" line from the well and the new "down" line.

2. "Mid Camino Real" Section - while excavating for the new line along the edge of the roadway, the workers struck and destroyed two telephone cables that we did not know the location of. One was the original multi-pair cable that went from the old telephone cabinet at the bottom of the McCamis property all the way up to the Camino Real pozo pedestal. The other was a newer 2-pair line that went from somewhere below up to the Loop residence. Since the Neely residence is still using Telmex for phone and internet, we had to quickly install a replacement duct and cable to get them operational again. This was an unbudgeted item.

While we had the road opened with a new trench for the water lines we had planned to install, we also decided to install a new electrical service feed from an underused CFE meter on the power pedestal in the McCamis yard up to the aljibe at Casa Loop. This new electrical service powers the AC pump in the aljibe that transfers water from the aljibe up to Casa Neely and Casa Thomson, thereby getting it off the McCamis feed. While installing the new electrical service, we decided to rebuild the CFE meter pedestal and rebuild the electrical cable rejistros since they were in very bad shape. This was also an unbudgeted item and the Chrimoyo Co-op shared the costs with the AC.

While routing the new water lines from the roadway into the bottom of the aljibe (planned), we encountered a very hard rock shelf that took several days of jack hammer work to get through. We also had to remove a portion of the floor in the pump bodega at Casa Loop (unplanned) and decided it was a good time to relocate the house supply water pump for the Casa up into the garage area above the aljibe (unplanned). This required some plumbing changes and rerouting of the electrical lines to accommodate (unbudgeted). We also found that there were two line shutoff valves buried in

the roadway that were not accessible (they had been cemented over) so we removed them and built a rejistro at the side of the roadway to house the new valves. We still need to build a cover for this rejistro (unbudgeted).

Also, while we had the aljibe empty to install a new larger outlet (from 2" up to 3"), we decided to take the opportunity to clean the aljibe as nobody could remember if it had ever been done. There was about 15-20 cm. of ugly sludge in the bottom. This was also work that was not previously budgeted for.

The field entrance to the upper portion of the McCamis property also had to be removed and reconstructed as the workers encountered an unknown drain that was buried along the side of the roadway, no longer usable due to being completely clogged with soil. They also encountered a steel dam water line that crosses the roadway in that area and elected to extend it further into the arroyo at the side of the Loop property so that it did not exit into the bodega that previously housed Loop's water pump.

3. "Upper Camino Real" Section - This part of the project went much better and quick progress was made with the trenching except for a couple of areas with heavy roots from nearby trees. We buried the new telephone line and duct beside the new water lines, and elected to also install a new electrical duct (2" orange poly tubing and associated cable pull rejistros) from the Loop's garage area up to the CFE meter pedestal and bodega at the Camino Real pozo enclosure (unbudgeted). We thought this a wise thing to do because we may need to use it for more electrical or control lines in the future between the two locations.

We also decided to enhance the entrance to the pozo site and reinforce the gates since they were sagging. We put in a reinforced concrete beam along the gate area to prevent further soil erosion inside the pozo site from excess rainwater runoff coming down the road from above (unplanned). We replaced the stone roadwork outside of the gates to prevent further erosion and repair the roadway in the area where the temporary electrical feed for the construction site on the west side of Camino Real was run. This was an unbudgeted expense but was billed and paid for by the owner. The excess soil from the trench excavation has been placed inside the enclosure to build the area up and level it in preparation for the installation of storage tanks in the future. As an unexpected positive outcome from this work, a new membership application from the owner of the home(s) under construction has been received.

4. Changes to Original Plan - In a change of previous plans, we have decided to use gravity feed of the water for the new 2" Camino Real line instead of "pressurizing" it. We will then be able to remove the Camino Real homes (currently 5) from the Chirimoyo portion of the system and gravity feed the Neely and Thomson homes. This will require a larger tank at the Camino Real pozo site than was previously budgeted for. We plan to initially use a 10 cu. mtr. tank instead of the budgeted 5 cu. mtr. tank which has yet to be purchased and installed. As an additional benefit, if we wish to transfer water further up the hill in the future (for instance in the case of undeveloped Lots along the dam road), we will have the infrastructure in place to do it much more easily.

To switch the timer activated pump in the aljibe over to an automated level control, on-demand system in the new tank, another level control system like we have for the La Calma and La Huerta well pumps was installed. We already had on hand or purchased most of the equipment needed including the antennas, tower, radios, etc. and built a pedestal inside the pozo enclosure on which to mount the antenna tower. This was required to get the antennas further away from the CFE lines and transformer

that are beside the bodega at the site. This is both for safety and to reduce the RFI potential from the CFE power lines. We will complete the system once the tank is in place and connected to receive water from the Loop's aljibe (or possibly a reactivation of the Camino Real pozo). None of this was included in the original budget for the Camino Real upgrade project.

The costs for the remaining work to complete the La Huerta upgrade is incorporated in the 2023 budget as Repair & Maintenance rather than Capital Projects to avoid the need for another Assessment in 2023.

What improvements do I feel need to be done in 2023?

In our ongoing mission to relocate as much of the *"Water System"* out of private property and into common areas such as access roads and streets, the Board of Directors proposed and received approval from the Membership at the 2022 AGM for the Camino Real portion of the multi-year La Huerta upgrade and a rebuild of the *"Distribution System"* in the Villas Bugambilias.

In the Villas, the plan is to install new water lines and *"Access Links"* along the edge of the common access road through the Villas. This will help to increase the accuracy of the water metering for each villa and ease the job of meter reading, subsequent billing and ongoing maintenance. This will also allow the *"Asociación"* to assume the support of this part of the *"Distribution Network"*. This work has not yet been budgeted for however if the Repair & Maintenance expenses during the year remain low, we may be able to start this project in the final quarter of 2023.

In Closing

One of the other things I keep track of is the status of the various *"Lots"* that are in the *"Water System"*. There were no changes during 2022 and there are still 51 "Lots" which are receiving water from the *"Distribution System"*. There remains 27 vacant *"Lots"* that have *"Responsible Members"* who have continued to keep up their support of the *Asociación* over the past few years by staying current with all Capital Assessments and annual Membership Fees. As of December 31st, 2022, the Asociacion has received one new Membership application for a new *"Access Licence"*, pending approval at the AGM.

And finally, a few words on another one of my tasks on the Board, Voter Eligibility for the upcoming Annual General Assembly. Of the above 78 currently recognized *"Lots"*, there were 76 that have *"Responsible Members"* who were fully paid up as of Dec. 31st and therefore considered to be "Members in Good Standing" and eligible to vote. 50 *"Lots"* with *"Access Links"* (of the 51) were fully paid up and 26 vacant "*Lots"* (of the 27) had paid their 2022 Annual Assessment Fees as of December 31st.

I continue to enjoy working with many of the residents and contractors in this community and to provide my assistance with maintenance and evolution of your *"Water System"*.