AGM 2018 - Water Commissioner's Detailed Report

Overview of 2017

As in 2016, the *"Water System"* has continued to function well with the focus of my efforts being placed on maintaining the System to keep all Members supplied with sufficient water to meet their needs.

System improvements and upgrades continued to be constrained due to uncertainty of funding by the Membership throughout most of the year. Much work still needs to be done to upgrade older meter installations (new term – *"Access Link"*), primarily in La Huerta, inoperative valves and the portions of the Distribution Network that will eventually need replacing.

Due to a concentrated effort on the part of your 2017 Board of Directors, collections on overdue payments in the last few months of the year helped and I was able to complete some of the planned work and start construction of the long awaited extension of the *"Distribution System"* across La Calma/Las Lajas Norte. Work on this project should be completed in early 2018 since Capital Funding is now in place.

Still not resolved during 2017 were two carry-over access issues from 2016 that have not been yet been resolved and brought to a final conclusion. A Member of the Asociación continues to block our access to the La Calma well site and a non-Member "squatter" continues to occupy the Bedell Casitas property. Both matters remain before the courts at the time of writing of this Annual Report.

Although the Asociación is not directly involved in the Bedell property dispute, a portion of one of the structures on the property is where I keep the Asociación's tools and spare parts. During 2017, I was able to gain conditional access to the bodega through the judiciary system, so the matter now has little impact on the ongoing Water Operations activities.

Well Performance

How are the wells performing?

In summary, both of the active wells (La Huerta and La Calma) were able to keep up with the demand that the Membership placed on them during 2017. Both wells demonstrated very stable performance.

I continue to monitor well performance by having daily readings of the meters that are installed at each well site taken. These meters provide the following information:

1. The **volume of water** pumped (water turbine type flowmeter).
2. The **amount of electricity** consumed (CFE's electrical wattmeter).
3. The **length of time** that the pump runs ("run-time" hourmeter).

With this data, I 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 over time. Consistency from month-to-month over the range of our demand is a good thing.

My appreciation and thanks to volunteers Dan Kralik and Byron Kirkham for assisting me by taking the daily meter readings at the well sites.

La Calma Well

During 2017 this well supplied a total demand for 8,150 cu. mtrs. with an overall efficiency of 1.40 cu. mtrs./kWhr. and average flow rate of 3.64 ltrs./sec. Total run time for the pump this year was 622 hours. The demand on the well ranged from a high of approx. 33 cu. mtrs./day in April to a low of 8.4 cu. mtrs./day in August.

For comparison purposes, during 2016 the well supplied 7,377 cu. mtrs. with an overall efficiency of 1.31 cu. mtrs./kWhr. and average flow rate of 4.71 ltrs./sec.

Again, as in 2016, a CFE power issue destroyed the motor on the submersible pump in the well. Upon inspection, the manufacturer of the pump recommended that we install 3 phase surge protection to protect the motor, which I subsequently did at both wells. I also decided to install a new type of motor starter/contactor (also at both wells) that will automatically shut down the motor if there are any abnormal electrical conditions that occur.

Due to a history of performance issues with this well in past years, the current "pumping" strategy is to keep pump cycle times relatively short and to try and keep daily demand below 30 cu. mtrs./day. It seems to be working as the well is now very stable. As has been mentioned before, if demand increases due to additional development in La Calma, or if there is a return to very dry weather conditions, we could experience significant problems with this well that would be very expensive to correct.

La Huerta Well

During 2017 this well supplied a total volume of 15,762 cu. mtrs. with an overall efficiency of 1.42 cu. mtrs./kWhr. and average flow rate of 5.13 ltrs./sec. Total run time for the pump this year was 854 hours. The demand on the well ranged from a high of approx. 65 cu. mtrs./day in April/May to a low of 15 cu. mtrs./day in August.

For comparison purposes, during 2016 the well supplied 15,413 cu. mtrs. with an overall efficiency of 1.35 cu. mtrs./kWhr. and average flow rate of 5.04 ltrs./sec.

As many of you know, we continued to have a high rate of CFE issues with the electricity supplied to this well site during 2017. To try and protect our Capital Investment, I installed additional/upgraded electrical pump control equipment at this well (see La Calma discussion).

This well continues to deliver in excess of 100 cu. mtrs./day on a few occasions during the dry season when demand is high and appears to do it without complaint. We are very fortunate as this well continues to meet expectations. In my opinion, there is little more we can do to improve on this.

Camino Real Well

Again in 2017, this well was not operated. It has been many years since it was last used. As a result, I have no information on its current condition or ability to produce any significant amount of water. I was able to complete the work of extending the well casing above ground level to prevent ground water from entering and contaminating the well, a CONAGUA requirement. In addition, the well was secured by placing a lockable cap on it.

If time and money permit in 2018, I would like to have this well inspected using a "down-the-hole" video camera. If the pipe casing is viable, it is possible that the well may only require a hydraulic cleaning to allow it to produce water of a useable volume. If so, a new pump assembly and electrical controls would be required to put it into operation again. It could then be used to supply the demand for the properties in La Huerta that are above the existing storage tank.

The site of this well is also the preferred location upon which to build a future water storage "facility" to replace the Loop's aljibe, the location that the Asociación is currently using.

Water System Performance Review

What happened with the Supply Network in 2017?

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

New lines were installed in the past few years to upgrade the *"Water System"* to a gravity fed type of *"Distribution Network"*. In 2016 there were a couple of leaks that developed in the new lines but since then, the *"Supply Network"* has been very stable and proven to be reliable. There were no leaks noticed during 2017 in this portion of the *"Water System"*.

What happened with the Distribution Network in 2017?

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

Much of the tubing in the *"Distribution Network"* consists of the original lines that were installed when the system was built. I have noticed over the past few years that a few glue joints have failed and couplings have split, particularly in areas where there may be a bit of ground movement. Also, some of the older shutoff valves have ceased to operate due to corrosion and/or buildup of scale. It is not practical to replace this portion of the system in its entirety so it will be an ongoing maintenance job to stay on top of new leaks and inoperative valves as they develop.

In March, a bad leak was detected and repaired in the old line that passes over the small bridge at the dam water canal on Calle Las Lajas. A temporary fix was done since this portion of the *"Distribution*

Network" will become redundant as soon as the new La Calma Norte Pipeline project is completed in early 2018.

In October, another major leak was detected on the Lake side of the Carretera near km. 12 (entrance to El Cerrito). The cause of this leak was a coupling failure, possibly due to a badly aligned joint in the tubing near the shutoff valve that is located there.

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 2017, we "lost" 2,568 cu. mtrs. (7.03 cu. mtrs./day) in the La Huerta branch and 1,015 cu. mtrs. (2.78 cu. mtrs./day) in the La Calma branch. The extraction taxes on this loss is about $10,000 pesos.

For comparison purposes, in 2016 we "lost" 1,807 cu. mtrs. (4.94 cu. mtrs./day) in the La Huerta branch and 2,205 cu. mtrs. (6.02 cu. mtrs./day) in the La Calma branch.

As can be seen from this data, a reduction in loss of 54% was realized in the La Calma portion of the *"Distribution Network"* due to the two major leaks that were detected and repaired as well as the replacement of older meters. Unfortunately, losses in the La Huerta portion of the "*Distribution Network"* increased by 42% but it does not appear to be due to any significant leaks. I remain of the opinion that this loss of water is due to overall degradation due to a combination of inaccurate metering and small leaks/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 2017?

Some progress was made during 2017 on the *"Access Link Upgrade Program"*. Over time, I am relocating some water meter installations to more accessible locations at or near the edge of property lines, changing out older meters and installing back-flow preventers and proper shut-off valves.

Five *"Access Links"* were upgraded and/or relocated during the year in La Huerta (Ness, Webb, Proud, Leader and the Dwyer Apartments).

"Access Link" upgrades in La Calma are almost complete now with only two installations remaining to be done (Reno and Nguyen). The *"Access Link"* for the Villas was relocated in October to a location near the entrance to the property and a "remote" register located on an outside wall. Initial comparisons between the readings of the old original meter (which is still in place) and the newly installed meter seem to indicate that the old meter was reading about 35% low. This will make a significant improvement with reducing our "loss" factor in the months ahead in La Calma.

As mentioned in the discussion on well performance, electrical issues due to problems within the CFE system were the primary cause of down time for the *"Water System"* during the year. To attempt to minimize damage to our equipment, surge protectors as well as a new type of contactor with "solid-state" protection were installed at both wells. Hopefully this measure will reduce the risk of damaging the pump motors due to any electrical problems that occur in the future.

What improvements do I feel need to be done in 2018?

There are still quite a number of aging meters still in use in La Huerta that also have no back-flow preventers or security and/or shut-off valves. There also remains a few "*Access Link"* installations that are not easily accessible and will need to be moved to the edges of the properties. This work is time consuming and difficult but during 2018 I hope to complete additional work on this program as time and available funds allow.

No progress was made with replacing the "shut-off" valves in the system that are old and are now seized in their "open" positions. This situation does not affect the flow of water but makes it impossible to shut down certain portions of the system for repairs or routine maintenance work. It will be an ongoing and time consuming task to replace or rebuild these valves as time and funding allows.

Water Quality

How safe is the water to drink?

One of the "Terms and Conditions" of our well concessions with CONAGUA is that we conduct a complete analysis of extracted water from each well at least once every two years. Since this was last done in early 2014, in early 2017 I arranged for testing samples to be taken by the State Water Authority, Agua Jalisco. As part of the research for this, I discovered that the Asociación is eligible to have this testing done for free by requesting these tests through the Water Dept. of the Municipality of Poncitlan. Even though the samples were taken in early April, we did not get the results until late July.

The test results showed that there were biological contaminants present in the water at the time of sampling. Agua Jalisco "recommends" that we inject chlorine at the well heads to reduce this level of contamination to zero - if the water if it is to be used for human consumption.

As a result of this report, I investigated adding chlorine injection and estimated how much chlorine would be required to adequately "dose" the volume of water our Membership uses.

The most common and practical way to implement this would be to use an industrial formulation of liquid "bleach" called Sodium Hypochlorite that has a concentration of 13% chlorine. This chemical is readily available, relatively inexpensive and used by many of the smaller water systems in the area. One of my main concerns with doing this is - **this stuff is really nasty to handle**. Typical household liquid bleach has a concentration of less than 5%, about 2.5 times more diluted. I estimate that we would need to inject about 200 litres/mo. of 13% Sodium Hypochlorite (combining the volumes of both wells) to realize sufficient free chlorine residual levels at the *"Access Link"* to completely sanitize the water.

The Asociación already owns most of the equipment to add injection at the well sites but would need to construct some sort of shelter beside each well to safely contain and store the chemicals and protect the

injection equipment. To implement a chlorination dosing and monitoring program, the Asociación would need to hire a third party contractor to take care of sourcing, handling and maintaining the system. This is not a job for retired volunteers.

I am reluctant to recommend to the Membership that we move forward with this for the following reasons. I am of the opinion that the largest use of water by the Membership is the watering of vegetation, not drinking water. Some people also have a "phobia" about adding chemicals to the water we use. There is also the added cost factor. If this level of contamination is present, I cannot currently guarantee that the water is safe to drink at all times of the year and at all households.

This is a matter that I feel should be discussed at the upcoming AGM so that the incoming Board of Directors can determine a course of action moving forward. For the time being, I recommend that all residents should either operate some form of water purification system in their home or drink only bottled water from reputable suppliers.

Security

How secure is our system?

Over the past few years, considerable effort has been made to secure the Asociación's well sites and storage facilities from vandalism, within the limits of practicality. In my opinion, there remains only one area of significant risk remaining - the water storage facility for La Huerta that is located under the garage area at Casa Loop.

Although access to the garage is now under the control of Members only, it remains vulnerable since it is not under the complete control of the Asociación. The Loops have indicated a desire to eventually sell their property and it may be necessary to discontinue the use of this aljibe at some time in the near future. Also, the booster pump that supplies water to Casa Neely and Casa Thomson is located in this aljibe and is powered by a wired connection from the stables on the McCamis' property. This situation could be eliminated if we proceed with the construction of a new storage facility at a different site that is under the complete control of the Asociación.

Future Capital Project Update - Elevated Storage Tank for La Huerta

As discussed above, the Asociación will need to eventually proceed with this project. It was initially approved by the Membership at the 2012 AGM but never moved forward due to a lack of funding. It was "re-approved" at the 2016 AGM but then cancelled at the 2017 AGM, again because of a lack of funding. Previous Board of Directors examined a number of alternative locations and system designs and determined that the most economical and logistically viable solution would be to locate a water storage facility over the Camino Real well site (corner of Calle Camino Real and Calle Las Flores).

Recognizing this future requirement, your 2017 Board of Directors started the process of attempting to secure the use of a 100 sq. mtr. portion of the Lot on which this well is located. Due to the on-going land dispute in the area, this work will need to be continued in 2018 by your incoming Board of

Directors. Until such time as this is finalized, in my opinion, it is not wise to move forward with the project at that location since it would put any Capital Investment we might do at greater risk.

Project Update – La Calma Norte Water Line Extension

In early 2016, work was completed on the first phase of this project. *"Phase 1"* consisted of approximately 250 mtrs. of 3" line that extended the existing *"Distribution Network"* from Casa Jensen to the new building that was under construction by Member Ana Villasenor. Since the Asociación was able to include the new line in the same trench in which other utilities were being buried and paid for by the Member, there was minimal cost to the Membership to complete *"Phase 1"*.

"Phase 2" of the project is an additional 480 mtrs. of 3" line to continue the extension of the line along an existing Federal "right-of-way" (the dam water pipeline) from Casa Villasenor over to Calle Las Lajas. There the new pipe will "cross-connect" to the existing water line that is buried along the edge of Calle Las Lajas. At the same time, a new branch line with a shutoff valve will be installed to replace the current service line to Casas Mills and Kelly as well as the currently undeveloped *"Lots"* in that area.

Due to difficulty with collecting the Capital Assessment to fund this portion of the project (as was approved at the 2017 AGM), work could not start on *"Phase 2"* until just recently (December 2017). As of this report date, work is underway and it is hoped that I will be able to complete this project during the first quarter of 2018.

In Closing

One of the other things I keep track of is the status of the various *"Lots"* that are in the *"Water System"*. As of December 31st, 2017 there were 53 "Lots" with *"Access Links"*, 2 of which are currently suspended at residences that are under construction. This leaves a balance of 51 "Lots" that are currently receiving water from the system.

There are an additional 54 vacant *"Lots"* that I have determined from "tribal" knowledge that were considered to have had an *"Access Licence"* (new term for the old designation of a Water Right) as part of the original plan for the community. Unfortunately, there is almost no documentation in the archives of the Asociación to confirm this and we have either lost touch with or have no contact information for many of the *"Responsible Members"* for these *"Lots"*. Of these vacant "Lots", there are only 18 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. The rest of these "Lots" have now lost their *"Access Licences"* and are no longer deemed to be part of the Asociación. Should the future owners of these "Lots" approach the Asociación to request a connection to the *"Water System"*, it will be up to your Board of Directors at the time to determine how much money to charge in order to provide an *"Access Link"* to serve the *"Lot"*. This will be done on a "case-by-case" basis since there are many variables to consider in order to determine a cost to connect.

Recognizing the above, in 2017 I took on the task of providing your Board of Directors with better information to assist it with placing a value on what an *"Access Licence"* might be. A committee was

formed, chaired by Doug Reno, to study this question. The starting point was to estimate the *"Replacement Cost"* of the current *"Water System"*, in other words, what would be the cost today if we had to build the system from scratch. The figure I came up with is approx. $5.6 to $6.0 million pesos in infrastructure (wells, equipment, tubing, etc.). If you divide this by the 71 currently recognized *"Lots"*, this works out to a value of between $79,000 and $85,000 pesos per *"Lot"*, not including any consideration for depreciation. Just something to noodle around when you think about what the added value to your *"Lot"* is of having access to this convenience and quality of water.

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 71 currently recognized "Lots", there were 62 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. This highlights an ongoing problem with have with collections and the restriction of water delivery to the "offenders" in a timely manner.

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"*.