# IWA PIPELINE

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## MORE THAN A HOLE IN THE GROUND!


Contrary to what some members and tourists believe, our drinking water on the Islands is not made from sea water. Although it is technically possible to do so with Reverse Osmosis (RO) treatment like ours, it would more than double our cost of production. And getting the permits and easements to treat sea water would not be easy, if even possible, given the many regulatory agencies that would be involved.

Instead, IWA uses deep wells as the source of our water. We are currently using 14 such wells, scattered up and down Sanibel-Captiva Road from the RO Plant (some inside the infamous wooden fences). These wells produce "brackish" water, which has a salt content of around 1/10th that of sea water. This water is great for RO treatment, but it would kill most vegetation if used for irrigation. The wells are Artesian, meaning that water flows from them without pumping, although not at nearly the rates we need. The water enters the ground in northern Florida, near the Suwannee River ... hence the name of the geological layer which carries the water to the Islands, the Suwannee acquifer. The water is a constant 84°F, Winter and Summer, which, coupled with our warm weather, leads to the fact that our "cold" water faucets give us water that is very warm by northern standards and which tastes better after being chilled in the refrigerator.

It costs us around $150,000 to drill a well. It's quite a process, and it starts with the very difficult step of finding a plot of land in a suitable location. And even after a suitable site is identified, there are no guarantees that we will find the quality and quantity of water that we need there!

After the site is identified, the next step involves actually making the hole in the ground, sometimes known as "digging" the well, but in our case more accurately called "drilling" the well. A large, truck-mounted drill rig parks over the designated well location and begins drilling a hole in the ground, starting with an 22" diameter drill bit! After the hole is around 50 feet deep, the drill bit is retracted and a 16" steel pipe called the surface casing is set into the hole. This keeps this part of the hole, which is basically in layers of sand, from collapsing inward as the well is drilled deeper. The drill bit is then changed to one "only" 16" in diameter and drilling resumes.

During the drilling process, the inside hollow core of the drill bit is used to extract a sample of water from the tip of the drill bit, at the deepest point of the hole. This is accomplished by a process, known as "reverse air," that uses compressed air to lift the water to the surface. By sampling this water continuously, we can tell when the water quality and quantity are appropriate for our needs, and at that point, we stop drilling, normally at a depth of around 800 feet. If the water is not of acceptable quality/quantity, the entire hole is filled with concrete and we have to drill another

one! This sampling process is an expensive one, but it is necessary to maximize the chances of success for our drilling efforts. Lack of this process is one of the reasons homeowners are frequently disappointed in the private wells they drill for irrigation purposes.

When the well reaches the desired depth, the drill bit is again extracted and, if the quality and quantity of water are acceptable, a 10" PVC (plastic) pipe, known as the casing, is set into the hole to keep-out the less desirable water at shallower depths. The length of the casing is determined by the continuous sampling process described above, and it normally extends 600 to 700 feet down the hole, leaving about 100 to 150 feet of "open hole" from which the water is withdrawn. Failure to accurately determine the casing length is another common cause for homeowner disappointment with private wells.

The casing is then "grouted" in place by pumping a thin concrete mixture between the casing and the outside of the hole. This isolates the various layers of the geological structure penetrated during the drilling process and prevents contamination of one layer by another one. The pressure at the bottom of the hole (under 800 feet of water!) is nearly 350 pounds per square inch (psi), or over five times the pressure in our faucets! This completes construction of the well itself.

Next we have to install a pump in the well. Our wells normally pump either 315 gallons per minute (gpm) or 625 gpm, depending on their flow capacity. The pumps we use are known as submersible, for the logical reason that they are submerged below water level down the well casing. A motor of 40 to 60 horsepower is also attached and submerged with the pump and an electrical cable is run down the hole with them to provide power for the motor. The pump and motor are hung on the end of a stainless steel 5 inch diameter "drop pipe" which is 160 feet long. Therefore the pump/motor are 160 feet under water, where the pressure is nearly 70 psi. Needless to say, the electrical components have to be very water-tight!

The last step is to install all the above ground electrical controls for remote operation of the wells from the RO Plant and the pipes (10" to 14") and valves to carry it to the Plant. When the water arrives at the Plant, it still has a pressure of around 40 psi and it is re-pumped to over 200 psi for treatment. In the next issue of the Pipeline, we'll discuss RO treatment. In the meantime, if you just can't wait or you want to know more, you can visit our Internet site at http://www.islandwater.com.

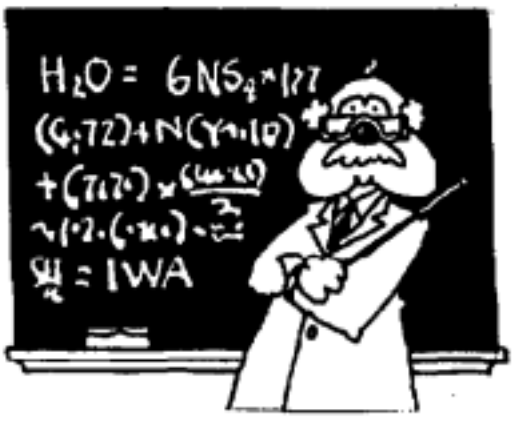
## 1997 ANNUAL MEETING

The 1997 Annual Meeting will be held on April 14th at 10 a.m. in our offices at 3651 Sanibel-Captiva Road. Materials relating to this meeting are enclosed with this Newsletter. ***PLEASE*** return your proxy to us.

As was the case at the last couple of Annual Meetings, we'll be happy to give anyone a tour of our facilities after the meeting is over. We'll even show you one of the wells described in the preceding article. Of course, we'll also have the customary coffee and donuts before the meeting begins. So mark your calendars. We're hoping for a big turn-out!

The Nominating Committee met on January 28th to select candidates for the three vacancies on the Board this year. Mr. Timothy A. Gardner, currently Board Vice President/ Secretary has been re-nominated for his third and last two-year term. Mr. Paul E. Garvey and Mr. Paul R. Storves, both currently serving as Board Vice Presidents, were similarly re-nominated, both for their second terms. A brief resume of all three candidates is enclosed on a separate sheet.

## QUIZ




1. How many gallons of water did IWA sell in all of 1996?
   A. 7.5 Million B. 159 Million C. 1.1 Billion

2. Our 10" interconnect line under the Bay only connects us to Pine Island Water.
   A. True B. False

3. Our $1,000 RO membranes (720 of them) last how long?
   A. 6 Months B. 2 Years C. 3.5 Years
   D. 7 years

4. Who owns the 433 fire hydrants on the Islands?
   A. Fire Districts C. City/County Gov. D. IWA

## OH NO!! NOT BACKFLOW!!

As previously discussed in this Newsletter many times, IWA has a program which requires the installation of backflow prevention devices on all our members' connections to our water mains. These devices are required by Florida law, which is being enforced by the Lee County Public Health Department in our area. Regardless of the law, the devices are highly desirable to protect our water supply from contamination by backflow from a member's premises into the distribution system serving everyone else.

Our current program began back in 1994. Since that time, all new members have been required to install a device. Next, we targeted the most hazardous connections, stretching the complete program out over several years. The program's first deadline of December 31st, 1996 for all non-residential members, has now passed. The great majority of the affected members have complied with the requirement and we are working with the remaining ones to get them in compliance in the near future. Installation of these devices, in accordance with our program timetable, is a requirement for continuing water service, and we certainly don't want to terminate anyone's water service. So if you are among those who have missed the deadline for whatever reason, please have the devices installed as soon as possible. Thanks!!

The next deadline in this program is December 31st, 1997 for all multi-family residences (condos, duplexes, etc.) and for those single family residences with a known hazard (e.g.: an alternative water source). The final deadline is after the year 2000 for the remaining single family residences, which will only require the devices when the property changes hands.

One other aspect of the backflow prevention program deserves repeating. The devices are not items of beauty. However, it is possible to make their installation much more aesthetically pleasing. Installing some type of removable enclosure over them is one option used by several members. Merely painting them (green, flat black, etc.) goes a long way towards improving their appearance, as does a vegetation screen around them. It is also very important to note that sun will cause the plastic pipe around these devices to deteriorate and fail over time. So painting or enclosures are **REALLY GOOD IDEAS** for that reason as well.

Give us a call if you have any questions about backflow prevention.

## A BETTER WAY

Measuring the water consumption of our members by water meters is an important aspect of our jobs at IWA. Accurate metering assures that those members who actually consume the water pay for it, as opposed to spreading some portion of the cost of their water use among all members. Reading and maintaining/installing our meters is not an inexpensive task. However it is often is the task which gives us the most contact with our members, and therefore it also serves a valuable customer service purpose.

At IWA, we are looking at several ways to improve our performance in this important area. First regarding metering accuracy, we have found an improved meter design that measures lower flows than our current meters. Industry experience indicates that a significant portion of the water we lose (i.e., don't bill for) results from the inability of our larger meters to measure low flows. For example, a member with a 3 inch meter currently gets all water under about 3 gallons per minute (gpm) for free, since our meters can't detect flows below that level. The new meter would measure down to 0.5 gpm, an improvement of 2.5 gpm. While 2.5 gpm may sound unimportant, it could amount to as much as 3,600 gallons per day or over 1.3 **MILLION** gallons per year ... an amount most of us would agree is significant.

Of course this an is extreme example, but the point is that we can much better allocate our costs with a small improvement in accuracy. We are continuing to evaluate our options in this area and are currently conducting trials on several installations.

Regarding meter reading itself, we are investigating several automated meter reading systems. Some require the readers to drive by the meters and the readings would be automatically recorded by equipment in the truck. Still others would automatically send the readings back to our office via cellular phone waves. None of these options appears to be completely suitable for our use at this time. But we are continuing to monitor developments in this area for future applicability. We are also investigating the use of outside contractors for meter reading, an option that some other utilities have adopted. To date, our analysis of this option indicates that the small savings that may be possible would be more than offset by reduced customer service. But again, we are continuing to monitor this area, and we will keep you updated.

## ANSWERS TO QUIZ

1. C. We sold over a billion gallons last year!
2. B. Pine Island (and therefore IWA as well) is interconnected with all of Lee County.
3. D. Our well water is so clean that our membranes last 7 years or more.
4. A. The Sanibel and Captiva Fire Districts purchase and maintain the hydrants.

## IT'S A MATTER OF TASTE...AND CHOICE


We have often been asked how our water compares to bottled water and the water from the familiar "machines" located at convenient locations throughout the Islands and on the mainland. Some people prefer the taste of these commercial waters. We decided to answer this question once and for all. So, we purchased a gallon of a well known bottled water and also a gallon from a machine. We sent both of these samples, plus a gallon of our own water, to an outside certified laboratory to see how they compare. The results are presented in the following table:

### WATER COMPARISON

| Parameter | IWA (mg/l) | Bottled Water (mg/l) | Machine Water (mg/l) |
|---|---|---|---|
| Cyanide | <0.03 | <0.03 | <0.03 |
| Arsenic | <0.005 | <0.005 | <0.005 |
| Calcium | 9.3 | 79 | 0.53 |
| Magnesium | 10 | 22 | 0.21 |
| Sodium | 116 | 5.2 | 7.2 |
| Organic Carbon | 3.4 | 9.5 | 3.5 |
| Chloride | 175 | 4.5 | 13 |
| Dissolved Solids | 406 | 338 | 44 |
| Total Hardness | 64 | 288 | 2.2 |
| Free Chlorine | 1.2 | 0 | 0.06 |
| Odor (Units) | 0 | 0 | 0 |

As you can see from the table, IWA's water is the highest (although well within regulatory limits) in Sodium and Chloride, the constituents of salt. This is because we treat water that is high in salt, and we can't remove 100% of it. Our water is also the highest in Free Chlorine, which is required by law for disinfection and health reasons. The bottled water is highest in hardness, which may make it taste better to some people, but it would be terrible as an overall water supply in terms of plumbing deposits and soap usage. The machine water is the "purest" of the three, but it may taste rather bland, since it is approaching distilled water quality. Also the lack of Free Chlorine in both the bottled and machine waters could lead to bacteriological problems if they are stored for too long and/or not handled properly.

All three waters meet the requirements of the regulatory agencies for all the parameters we checked. So which is the best? It depends on your criteria. One thing is certain ... IWA's water is by far the most cost effective, at 0.3 to 0.6¢ per gallon, versus 25¢ for the machine water and $5.68 for the bottled water! It's your choice!