

Report on Committee Findings and Suggestions
for the
Palomino Lakes Mutual Water Company

December 11, 2001

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Errata

4/2002; Sections 4.4.2, 6.3 and Appendix D discuss the 30-year loan payoff. The data given as to the remaining amount on the loan was incorrect and the proper data has not been received and evaluated. As a result, the 30-year loan payoff amount and schedule should be considered inaccurate.

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1. Introduction

This committee was asked to review several areas of concerns for the Palomino Lakes Mutual Water Company (PLMWC) put forth by Palomino members. These included: a) examining ways to build up reserve funds, b) reviewing the well for water safety and supply issues and c) exploring ways of addressing rising energy costs. The result of these findings have an impact on the PLMWC budget so those issues were also addressed with respect to items to be included in long-term budgetary planning. It should be noted that cost increases are likely no matter what we do and it is with difficulty that this committee addressed issues that would not only increase water rates but also the consideration of proposals that would mean higher short-term costs to the PLMWC. We took this seriously and we hope that the community will review our recommendations without prejudice.

In order to perform this work, the committee undertook a walk-through review of the complete water works for the community, sat in on board meetings, and worked with outside contractors in order to gain a good overview of the issues at hand. Additionally, through the PLMWC, a letter was sent out in September to all members asking for their input, listing the objectives and contact numbers for the committee members. Sadly, little response was received.

The work this committee undertook was a look into the future. A future of declining water availability (and quality) in the surrounding region, and of rising energy costs. We have examined the issues in an effort to ensure the quality of our water system for years to come. Traditionally, the PLMWC board structure has encouraged attention only to immediate concerns, typically focused on the day-to-day operations and maintaining the system status quo. We are hoping that what we present here will start the trend toward long-term planning, carried over changing boards and a changing community. The long-term proposals presented here will not necessarily reduce the community's cost of water but may more importantly, reduce the escalation of these costs.

In the sections that follow, each of the areas we were asked to examine are presented. We will try to be complete in presenting how we explored the issues, the resources we drew upon and the basis for our findings. It is expected that part or all of this document may be presented to the community as a whole and the document has been written in that manner. If questions arise, please feel free to contact us for clarification. We hope that the work presented here will benefit both the PLMWC and the community as a whole, enhancing our water safety and ensuring our water system longevity.

2. The Palomino Lakes Water System

2.1. The Physical System

The Palomino Lakes Water System is comprised of 4 sites – the well, and three tanks. Each site

has its own PG&E service and time-of-use (night/day) electricity meter, each generating its own bill. Each residence in the community has its own water meter, maintained and read by the PLMWC. There are approximately 108 metered connections to this system, and the system covers an elevation to over 1150 feet.

The well lies out in the vineyards almost directly across from Cedar Lane, roughly 1000' from the main channel of the Russian River. The well has a 20' deep casing, that is perforated over the last 10', with the sanitary seal standing about 3-4' above the surface. A 4' deep concrete annular seal surrounds the upper portion of the well casing, with the remainder of the casing gravel packed. The well pump motor is a 20 hp 220volt 3-phase unit, completely sealed and submerged at the bottom. The pump has a capacity of 190gpm and develops a 400' head. Water is primarily pumped during the PG&E 'night time' (off-peak) designation period. Treatment is by a diluted sodium hypochlorite (chlorine) solution injected just past the well head¹, and is regulated and checked by a licensed water system specialist. Water from this site is pumped to Tank #1.

Tank site #1 is located on Palomino Road at the first curve above Oak Knoll Terrace. At this site, there is presently a 15kgal redwood tank that is to be augmented by a 10kgal steel tank presently under construction. At this site is a 25hp pump that pumps water up to tank #2. Gravity-feed is used to fill the tank (from tanks 2 and 3) during the day and to supply the metered connections lying below the tank. Gravity feed between the tanks is regulated by a series of float switches.

Tank #2 is located along Mountain Pine Road, just above Willow Terrace. It is a 15kgal redwood tank. There is a 20hp pump at this site for pumping water up to tank site #3. The same gravity feed system (as tank #1) applies here.

Tank site #3 is located at the top of Toyon and includes a 100kgal steel tank and a 10.5kgal concrete tank. There is not a pump at this site, the only electricity usage being for local irrigation and a work light. Part of this site sits on an easement from Seghesio, to whom we provide water access rights in exchange.

All sites have an alarm system tied to the level of the water that calls down through the PLMWC group when a problem arises.

Routing of water to the members is through a combination of AC² pipe (old) and PVC (new). The

¹The recent detection of bacteria levels can be at least partially attributed to the well location, its depth, and to the chlorination method. With large rainfall amounts, the well is readily infiltrated by surface water, overwhelming the chlorine injected and increasing our susceptibility to bacteria as well as chemical contamination.

²AC piping is a asbestos fiber strengthened concrete pipe that creates no documented hazard to the consumer. The fibers act like the steel reinforcement found in concrete building walls and other structures to provide the wall strength needed to transport water at system

supply piping from the well to tank #1 and from tank-to-tank also serves as the system distribution piping (for members on tank #1, this is why we sometimes see a fall, then surge of pressure as the well pump develops the head needed to counteract the gravity feed delivery to our homes). Copper or PVC piping is typically used from the meters into the members' homes.

There are 3 non-assessed water users on the system, probably from easement considerations. Current projections indicate that we pump / provide over 17.5 million gallons a year to our community with the peak demand being July through September.

2.2. System Management

In the area of system maintenance and billing, the PLMWC board takes much of these responsibilities upon their shoulders. They are the ones that get woken up in the middle of the night by the water level alarms, and they are the ones that contract and manage the work the contractors³ perform on our system. We should all be thankful for people like Dave Collard and Russ Armstrong who, although not on the current board, have consistently put in long hours for PLMWC and the community.

2.3. Water Quality

Our water system falls primarily under the governance of the Department of Health Services (Division of Drinking Water and Environmental Management). It is through this agency that the types of testing and the maximum safe levels for various compounds that may be present are mandated.

Weekly water testing (basic) is performed by a contracted water specialist. It is their responsibility to ensure the chlorine levels are correct and to take samples for the presence of bacteria and to log the results.

Extended Bacterial and chemical testing falls under the PLMWC (board) responsibility and is currently being coordinated by Martha Vuist-Bruske.

As we move into the future, increasingly-strict governmental regulations will require more extensive water testing as well as the licensing of, and operations by, a Water System Distribution Operator. These activities will constitute added cost to PLMWC as they become mandated.

pressures. Our system is periodically tested specifically for asbestos to ensure the continued safety of our drinking water.

³Our primary contractors include Clover Electric, Weeks Drilling and Rege Construction.

3. Annual Expenditures and Revenue Sources

PLMWC has total annual expenditures of approximately \$47,000 (not counting large maintenance items like new tanks or broken pipes) with income from water usage billing of approximately \$50,000. For the most recent accounting year (2000/2001) the distribution of the expenditures is as follows:

<u>Line Item</u>	<u>2000/2001</u>		<u>Normalized</u>	
Interest on loan	\$ 9,533	5.8%	\$ 9,500	20.7%
PG&E	\$ 8,500	5.2%	\$ 9,500	20.7%
Repairs & maintenance (Incl new tank #3)	\$131,122	80.0%	\$ 15,000	32.7%
Water Specialist	\$ 4,167	2.5%	\$ 4,200	9.2%
Insurance	\$ 1,489	0.9%	\$ 1,500	3.3%
Taxes	\$ 1,143	0.8%	\$ 1,150	2.5%
Postage & supplies	\$ 583	0.3%	\$ 600	1.3%
Accounting & legal (Incl easement, tank#3)	\$ 7,543	4.6%	\$ 4,000	8.7%
System supplies	\$ 143	0.08%	\$ 150	0.3%
Phone	\$ 206	0.1%	\$ 210	0.4%
Total	\$ 164,529		\$ 45,810	

Rising energy costs will definitely impact these figures, with preliminary PG&E energy cost projections for the year 2001 showing a 25 to 55% increase.

4. The Issues

The issues over which this committee was formed came from the members of the Palomino community at the past few semi-annual meetings. At the most recent meeting a nomination was made to form this committee to examine these issues in detail and to propose solutions. In the next few subsections, each concern is discussed and the approach the committee took to explore the issue is presented. The recommendations follow at the end of this document.

4.1. The Source Well

Palomino Lakes draws its water from one well that is located in the vineyards approximately 1000' from the main channel of the Russian River. The well lies in a flood plane and during the winter months, often lies in standing water. The well was drilled in approximately 1972. In accordance with current regulations, our well is *not* up to legal standards.

4.1.1. Is the Well Deep Enough?

Our well is drilled in an area that lies atop the upper reaches of the aquifer underlying the Russian River. This aquifer is an extensive gravel bed, laid down over millions of years, separated by clay or rock layers, extending some distance below the meandering path of the river, and can be found throughout most of the river's reach. The main portion of the aquifer lies south of us, predominately in the lower Healdsburg through Laguna de Santa Rosa areas. It is unknown how deep the aquifer is here although it is likely to be relatively shallow because it is the upper reach.

For the true aquifer, it may take several years for ground water to reach it as it slowly percolates down through the various layers. However, in shallower wells, the flow of the river as well as a subterranean flow a few feet below have a much more direct impact.

A major concern of anyone drawing water from a well is that the water being pumped from it has had a sufficiently long path through filtering gravels and sands. It is these gravels and sands that remove harmful bacteria and chemicals. In the past years the local municipalities have had to continue to drill deeper and/or add water treatment facilities⁴ as the local filtering quality of the aquifer has become impaired.

Our well, being relatively shallow, is replenished primarily by the subterranean river flow, with a minor amount coming from sub-surface flow off the Maacamas. Our well is impacted in a relatively short time frame by the activities in the agricultural field where it lies -- where various chemicals are employed and where farm workers use nearby facilities to relieve themselves -- as well as by what happens up-river (and up-slope) from us.

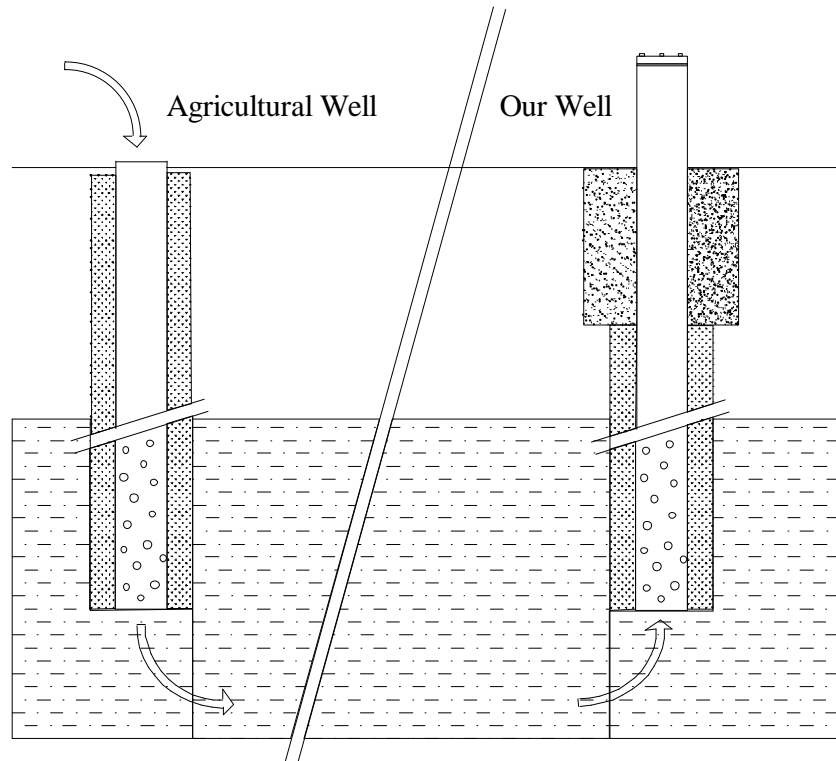
4.1.1.1. Chemical & Bacterial Intrusion

For our investigations, we discussed the site with Weeks Drilling and reviewed the state water quality report on our well as completed earlier this year. Based on the data reviewed, the well is

⁴Commercial water treatment typically includes filtration and UV irradiation in addition to or in place of chlorination.

too close to the surface and is showing trace amounts of agricultural and industrial chemicals⁵. Based on interviews, it is believed that we receive the bulk of our water from the immediate area, including the Russian River through minimal natural filtering. During the winter months, this is exacerbated by the proximity of an agricultural well (<150') that has no sanitary seal and allows surface water to readily enter the subterranean region we draw from. This is a well that PLMWC had drilled in exchange for easement rights. This problem is illustrated below.

The State Department of Health Services (DHS) and Weeks Drilling are both recommending drilling the well to provide at least a 50' sanitary seal (the current is 20' with the last 10' perforated). This will provide us with an additional 40' of filtering capabilities (if we can go the full 50' depth and still be in the gravel-based aquifer). The alternative to drilling a deeper well and extending the casing is to build extensive filtration and chemical treatment⁶ into the system.



Regardless of what approach we take, the state has started PLMWC on a regiment of extended chemical, bacteriological and radiological testing to begin monitoring the possible intrusions more closely. Results from these tests will be distributed in compiled form to the Palomino community by PLMWC as required by DHS.

4.1.1.2. Eel River Diversions and Moderate Drought

⁵Trace levels of nitrates, ethylbenzene, xylene and toluene were discovered in the most recent analysis (July 2000).

⁶The costs of post-well filtration and treatment has not been considered in this report. It would include filtration and UV, in addition to chlorination. Such costs would also have to include the periodic replacement of the filter components as well as a higher-level certification for the water system operator.

We are all aware of the continued issues over gravel mining, the diversion of the Eel River, and the possibilities of periodic and prolonged drought periods. During the past year several wells went dry north of us, at least one known to be 20' deep. The well beside ours, as measured in October 2001, has a water level of 15' below the surface. Given the extraordinary usage by the surrounding vineyards, the potential for discontinued Eel River diversions and moderate drought conditions, the possibility of our 'sucking air' in light of is felt to be quite high. It is surprising that we have not done so already given the information we have received in our investigations.

The recommendations offered by Weeks and the State (of drilling the well deeper) would benefit us under such a scenario.

4.1.1.3. Can We Drill Too Deep?

One concern that was brought forth in our investigations is that some wells in the area have had to be abandoned due to excessive boron concentrations. Boron, while not normally harmful to humans, kills plants in sufficient concentrations. Apparently there are areas, potentially at the greater depths, where boron concentrations do become a concern. Potential boron concentrations cannot be projected for different depths or locations⁷ so we will need to take samples throughout any test drilling to determine if a potential for the problem exists. We should also retain the existing well as a fall-back should future problems be encountered.

4.1.2. Does the Well Pump Need to be Replaced?

Typically a well pump lasts approximately 5 years. Based on conversations with Frank Crivello and Weeks Drilling, the well pump is indeed at the end of its projected life span and needs to be replaced soon.

4.1.3. How to Drill Deeper Without Impacting the Neighborhood Supply for a Long Period?

A question arose on how long it would take to drill a new well, replace the casing and sanitary seal, and to install a new replacement pump (all should be done together due to the work involved in opening the well, etc.). The question has merit as we would not be able to pump water during this period and would have to rely upon water already stored in the system tanks, thereby rationing for the duration.

It was suggested that a test drill be done with a hollow coring bit before the actual drilling is

⁷Data from other wells suggests that penetration of the first hard rock layer enters into old aquifer layers more heavily influenced by geyser field-type activity, and hence, higher concentrations of boron.

contracted / performed. This would provide us with an assessment of the extent of the viable aquifer depth and to be able to specify the drilling job (and equipment) more accurately.

Once the depth is known, the actual well should be drilled parallel to the existing well (a minimum of 10' distance is needed). The new well would be cased and the sanitary seal and new pump added. This well would then be plumbed to the existing well with a valve to isolate each. In this manner, the new well would come on-line by simply switching from the old well. In addition, the old well would be retained as a backup (including the old pump) as it exists.

4.2. Other Water Issues Throughout the Community

In reviewing the water system with Frank Crivello, other issues came to light as had been expressed by members of the community or those elected and on the PLMWC board. These issues are described in the following subsections.

4.2.1. Upper Palomino Members have Insufficient Water Pressure

Upper Palomino (above Willow Terrace) members, especially those on the east side of the road, have expressed problems with insufficient water pressure. From what the committee has learned, these houses utilize tank #2 and because the tank lies at nearly the same elevation and the pipes supplying the houses run along the road – which lies at a lower elevation than the house – the total pressure is far less than what others in the community enjoy.

Working from the PLMWC water routing maps and talking with Gil Dawson of Weeks amongst others, several options were explored. These included an in-line pump, a pressure tank located in each affected residence, or the re-routing of new water mains behind the residences (above, in altitude). Weeks pointed out that rather than routing a new line behind the affected properties, disconnecting the stub from Tank #2 to this stretch, and reconnecting it to tank #3 would be probably a more logical solution in terms of cost and logistics. This would mean the easement to only one or two properties would need to be obtained. We then worked with Bill Rege of Rege Construction to determine potential problems and routing for the same. All three options and additional notes are presented for consideration in the next section.

4.2.2. Water Totals from the Well Meter Don't Match the Totals from the Community

Apparently this is a long-standing issue for which many different explanations have been proposed. The most common (and accurate) is that there is always an error factor with every meter. Compounded over the 100+ meters of the system, there will be a noticeable discrepancy.

However, there is also one area that has historically been pointed out as ‘wet’ – that of upper Palomino (above Willow Terrace, in the level area on the east side). From a historical perspective, it is reported that there is a seep in the area. However the water line also runs through the same ditch. In speaking with Gil Dawson, he made the recommendation that we test the water (in the ditch) for the presence of chlorine. If indeed there is chlorine, we know the water is leaking from the pipe underlying that area.

Should members know of other ‘wet’ areas, please notify PLMWC as leaking system pipes cost all of us.

4.2.3. Can We Replace the Redwood Tank at Site #2?

Tank #2 has the highest usage in the system and is an older redwood tank, subject to the same conditions that called for the replacement of other redwood tanks in the system. Frank Crivello feels that the need to increase (or ensure) the capacity at this site is critical, although some of the capacity increase needs may be offset by the Upper Palomino resolution. This committee has included a steel tank replacement on this site as part of the budget discussions.

4.2.4. Miscellaneous

4.2.4.1. Preventive Maintenance Items

It was noted that one or more of the tank site pumps are not bolted down (or not secured properly). This may cause unnecessary stress to the connecting pipes (the only source of support). This was discussed with Weeks and a flange design was suggested and is included in budget considerations later in this report.

Preventive maintenance also includes what may be more accurately termed ‘predictive maintenance’. Predictive maintenance includes the generation and maintenance of written logs regarding the age of equipment and predicting the likely time of necessary replacement in anticipation of potential failure. An example of this would be the well pump -- with an expected life of 5 years. Predictive maintenance would place a replacement pump on the budget for the 5th year to insure a replacement was on hand in case of failure. Ideally, predictive maintenance would also schedule the replacement before the failure impacted the community at large.

4.2.4.2. Delinquent Accounts

Early on the committee was made aware that there is at least one community member consistently

past due on their payments for services, both for PLMWC and for the Neighborhood Association. This has been an on-going concern, one that has been brought up at neighborhood meetings repeatedly.

Delinquent accounts impact all of us by reducing the available funds for repairs and maintenance, and most importantly, by taking considerable board member time and adding to their frustration of doing the job we elect them for. Additionally, once 2 or more payments are missed (and no effort is made to even partially pay the past due amount or work out alternative payment methods), it becomes more and more difficult to collect the amount due.

4.3. Rising Energy Costs

Electricity accounts for over 15% of the total costs of running the PLMWC system. With electricity costs slated to continue to rise, examining all possible ways to reduce energy consumption should be a key issue for this community. At the present time, the committee does not have enough information to ascertain the PG&E rate increases over the past year, but those to date indicate it is substantial.

4.3.1. Why Not Drill a Well at the Top and Save Pumping Costs (Uphill)?

Weeks Drilling was contacted to get their advice on the possibilities of drilling at the top of the community (near tank site #3 for example). Weeks has drilled several wells in the area, including near the river, at the base of the hills, and in the hills themselves.

Weeks response was this: A well in these hills could produce 5 to 10 gallons per minute (gpm) at one location and another site nearby could produce little to nothing. At best, you may be able to locate a source able to provide one to two houses with sufficient water but the costs of locating a viable well could be quite high.

If we consider that our well currently produces over 100kgals a day (pumped during the 12-hour night-rate period), or nearly 190gpm, then the likelihood that we could locate an identical site at the top of the community is nil. This committee decided that the expenditure of a survey and test drilling could not be warranted at the present time.

4.3.2. What About Self-Generation of Power?

In order to investigate the possibility of power generation, this committee contacted several alternative energy consultant firms for their advice. PG&E and the state were also contacted about both how to connect to the power grid and about what rebate and loan programs were available. The water system was discussed and possible sites were 'walked'. Systems of solar and

wind (singular and in combination) were examined. Since the PLMWC system already has a substantial investment in existing (AC) pumps and related equipment, and since each site has a separate PG&E power drop (and meter), all approaches except net-metering⁸ were withdrawn.

Examining the electricity consumption of the PLMWC system (~85MW/year or ~236KW/day) against the sites available, it was determined that only a portion of this could be generated. Furthermore, the state rebate programs limit the total system size to 10KWh⁹.

In examining alternative energy sources, we realized that we would need a certain amount of land on which to site the solar and/or wind equipment. To avoid the question of easements and the like, we decided to restrict our considerations to one of the existing (tank) sites. Tank site #3 has the highest solar and wind visibility and the largest area so it was chosen for the purpose of this study. In examining the site, we looked at mounting solar panels on top of the 100kgal tank there and/or in the perimeter area (along the fencing). Due to the logistics and framework costs for tank mounting, that approach was scrapped. Realizing that the space 10KWh worth of panels would take up was stretching it, we asked that a 3-5KWh wind turbine be considered in conjunction with 5+KWh of photovoltaic panels. Considering wind also allowed us to supplement lower solar production in the winter with the higher winds we normally experience during that same period.

Based on solar availability of 6 hours / day, ~350 days / year and wind at ~4 months/year at 12 hours / day, it was estimated that a 10KWh system could generate roughly 21% of the total PLMWC electricity consumption (or ~17MW/year). This works out to be roughly 3.5% of our total annual system costs.

This cost offset is relatively minor when examined in the light of the complete PLMWC system. Yet its installation will serve to buffer continued energy cost increases. With projections of the continued rise of electricity, and the end of cheap oil (somewhere between 2004 and 2008), we strongly advocate proceeding with a system design as outlined in the appendices that would be expandable as funds and desires warrant. One more note: PG&E, in conjunction with the state, pays for nearly 50% of the system costs, including installation. This is considered in the budgeting issues.

4.3.3. How About Encouraging Water Conservation?

⁸Net-metering is the production of electricity, converting it into line-level AC voltage and feeding it back through your meter to offset energy used in the day-to-day operation.

⁹There is a Distributed Generation rebate program run by PG&E but the smallest system considered is 30KWh. The 10KWh program is called the Renewable Buydown Program and is run by the CEC.

Water conservation is an important issue for the PLMWC to stand by and embrace. In the coming years we will be faced with the continuing rise of energy costs, the potential of the Eel River diversion halted, and more frequent and more severe droughts.

Based on current PLMWC agenda, water conservation pamphlets are being requested from the state for distribution and more detailed information is available upon request. Community residents should be seeing these pamphlets shortly (if not already).

For those of us that love to garden, a move to xeriscaping -- or the predominant use of native and drought-tolerant plants -- is a good step. We encourage anybody interested to contact the variety of gardening resources we have in this area, including the California Native Plant Society (several people in the community are members).

Another area where we can create an environment of water conservation awareness is to examine the 'free water' basis our billing system creates. Several residents have noted that allowing 'unlimited use' (up to 90kgals per quarter) does little to encourage conservation. This committee took this to heart in the rate structuring investigations.

All residents should be aware of their water consumption, and of the possibility of excess usage caused by leakage. This committee would like to encourage the PLMWC to stress that residents check their water meters and all of the water piping annually for signs of leakage. There is a company one member of this committee used following a landslide -- American Leak Detection -- who comes in and uses acoustical monitoring to find even slow drip leaks (a leaking water heater and leaking water meter was found!). Remember, the piping from the meters into and through your residence is your responsibility.

One last point before moving on. During fire season, we all need to be especially cognizant of water conservation, especially between noon and 6pm (when the pumps are off), to ensure that sufficient reserves are available for fire-fighting!

4.3.4. Can We Upgrade to Higher-Efficiency Pumps?

Higher efficiency pump motors are another likely candidate for energy conservation. Although there are not 'Energy Star' devices that we are aware of, the moving of pumps (motors) to 480 volt, 3-phase service would reduce energy costs and potentially increase the life time of the pumps. For the new well, such a pump is specified in the quotation received.

4.4. Reserve Funds

Earlier this year a \$396 assessment was made to cover the cost of supplementing the redwood

tank at site #1. For some, this assessment came at a difficult time. The question was raised – can we reduce such spot assessments in the future? Secondary concerns surfaced about building up reserve funds to make such assessments less likely. To wit, the Palomino Neighborhood Association has built up its reserves to the equivalent of 1 year’s dues in reserves. When this amount is exceeded, the association has cut further dues for the year in question. Having reserves built up is an important issue since this committee recognized that there are additional large-expense items to be considered over the next 2 to 3 years.

4.4.1. Can We Build Up Reserves so that Large Assessments are Less Likely?

The committee reviewed the possibility of restructuring the water rates to address not only increased energy costs but also to build up reserves. In examining historical water usage trends it was realized that simply increasing rates would not guarantee the development of a reserve account. The committee then examined the possibility of adding a reserve assessment to directly address this issue. Based on reviews of various scenarios, this proved to be the most viable approach and allowed the reserves to grow even when potential water conservation issues are taken into account. A proposed rate structure is discussed in detail later in this report.

4.4.2. What About Paying off the Long-term Loan (Quicker)?

If the 30-year loan was paid off, the \$36 quarterly loan assessment (ref. your water bill) could be removed or employed elsewhere. This committee reviewed the possibility of prepaying a small amount of the loan principal each month to accelerate the loan completion date. However, in light of the other expenses that we need to make, the collection of additional funds for this purpose was discarded. Instead, the loan repayment was added as a long-term budget item for consideration at a time when the other major items noted have been taken care of.

4.4.3. Could Assessments be Projected so that we can Budget for Them?

Being able to determine assessments in advance (i.e. a minimum of one year) requires that major expenses be forecasted. This is reasonable when we are talking about upgrading a part of the system that has a limited life; but it is difficult to forecast when a catastrophic failure (or potential of) might occur.

This committee considered this problem and determined that the creation of a long term budget projection, with any necessary assessments projected, would be a relatively straightforward activity for the water board to carry out and pass on to a new board as it was voted in. Coupled with the buildup of a one year reserve, system failures (emergencies) could be handled with minimal financial duress on the community members.

5. Summary Recommendations

In the following subsections recommendations for the various issues discussed up to now are presented. Highlights have been reiterated in italics, and at a minimum, these highlights should be conveyed to the community at large.

5.1. Rate Restructuring

Proposing that rates be increased is a difficult and sticky issue. However, if we are to maintain the quality and quantity of water this community has enjoyed for the future, we must take steps now. We examined several methods of restructuring the rates to minimize the financial impact, especially on smaller consumers, while trying to address the issues surrounding water usage. This was accomplished through a spreadsheet mechanism that will allow others to try various scenarios as well. Appendix A contains the spreadsheet, illustrating the basis for the recommendations on rate restructuring. The following paragraphs summarizes the considerations made.

There are 3 issues being addressed through the rate restructuring:

- 1) To encourage water conservation
- 2) To increase revenue from high water usage to cover rising maintenance and energy costs.
- 3) To build up fund reserves for long-term high-dollar projects and emergency repairs.

In developing the proposed restructuring of rates, the City of Cloverdale Water System as well as the current PLMWC rates were employed.

We then examined the house-by-house usage over several periods. From this we derived a average usage (extremes capped) from which to assess the base usage figure (of 90kgals). We further qualified this figure by the percentage of users falling into each category. An average of 58kgals was derived from which we selected a base figure of 60,000 gallons.

A new base usage of 60,000 gallons was derived from an adjusted average of 58kgals

Knowing that a reserve was a necessary outcome of this work, we then examined the idea of adding a reserve assessment figure as part of the base rate. By having the assessment as part of the base rate, we felt more confident that the reserve would be built up without as much impact from usage fluctuations.

A reserve assessment figure was added while reducing the base usage cost figure

Lastly, we examined the rate structure and determined that a progressive rate structure would be more beneficial with respect to the average consumer. In other words, those employing higher water volumes should pay a larger share toward maintenance and energy usage.

Based on our work, the following rate adjustments are recommended:

- Add a Reserve Assessment item.
- Reduce the base usage amount from 90kgals to 60kgals.
- Change the base charge from \$0.82/kgal to \$1.00/kgal.
- Set a rate of \$1.60/kgal for water usage between 60kgal and 90kgal.
- Set progressively higher rates for usage quantities in 90kgal increments above this.

The average home owner (55% using less than 60K gallons) should see a \$10.00 increase with the new rate structure. The average increase across all users will be \$28.82 at peak usage (July-September).

It should be noted that the city of Cloverdale's billing for 60kgals would be ~\$173 compared to the proposed \$120 (90kgals would be ~\$263 vs \$168).

When we examined the rate issues, we originally discussed the idea of paralleling PG&E's 20/20 rebate program for reduction of (water) usage over the previous year. However, when we explored the issue further we realized that there were insufficient records available to be able to effect such a program and that the increased accounting costs would offset the marginal conservation encouragement. Conservation is instead encouraged through the lower base quantity and the progressive rates.

We cannot recommend offering rebates or discounts on annual reductions due to increased accounting costs and marginal conservation benefit.

The committee also reviewed lessening the impact of the rate restructuring on the homeowner by changing from quarterly to monthly billing. Monthly billing may indeed assist in reducing delinquent accounts. We realize that a change to monthly billing may increase accounting costs but this may be very well offset by the benefit to the homeowner and more timely receipts.

We recommend that monthly billing be considered

Given that monthly billing may be too costly (in terms of both time and actual expense), another option to consider is to shift the quarterly billing period slightly. Currently one of the billing periods falls in the hottest three months. If we instead shifted the billing quarter from July-August-September to June-July-August, this may also help reduce the impact on community members.

If monthly billing is not an option, we recommend that the quarterly periods be shifted

Note that even with the new rate structures, it will still take roughly 6 years to build up a one year's reserve. It should be acknowledged, especially in the light of the other recommendation from this committee, that additional assessments are likely over this same period. This committee recommends that through the use of good budget planning and contractor coordination, that any additional assessments are spread over several billing periods to offset the impact.

It needs to be stressed to the community that near-future assessments are still required in order to meet the goals outlined in this report.

With these recommendations, the committee stresses that the intent of the reserve assessment is to build up the reserves. Once the reserve (of one year) has been reached, the reserve assessment should be terminated.

The reserve assessment is a time-limited assessment to be terminated once one year's worth of operating funds have been reached.

5.2. Source Well

It is highly recommended that a new well be drilled to a minimum depth of 50 feet with full considerations of current water laws, and that the current well casing, pump and sanitary seal be maintained as a backup using a valved interconnect.

Weeks Drilling was employed to help determine the issues surrounding this endeavor. These included how to drill a new well without disrupting the community's water service and how to determine the aquifer's viable (vertical) boundaries.

Weeks Drilling identified a method to save us money while ascertaining the correct depth for the actual well to be drilled. This involves using a hollow core drill to quickly sink a small test hole. Drilling the test hole would only take 2 or 3 hours, and it was recommended that we chose two potential sites to make the most efficient use of this service. Additionally, we should explore our easement and any options of expanding it or shifting its boundaries so that the test drilling can assess the widest area available to us.

Ideally, the new well should be located at least 150' from the nearest existing well to reduce draw-down influence.

The use of the hollow core drilling would allow us to determine the start of the water source and the depths of the filtering gravels. During this drilling, samples should be taken at various depths to look for the potential of higher boron and other harmful compounds that might potentially exist at different levels. From this, an idea of the extent of the aquifer depth can be determined and the ideal well depth ascertained and a final bid request can be accurately prepared. This

(depth/aquifer extent) information should be noted in a clearly defined place for future PLMWC boards to reference / employ.

A test bore should be performed before actual well drilling, along with water samples for testing, and that data should be placed in PLMWC's files for future boards to reference regarding the state and extent of the aquifer this community pulls its water from.

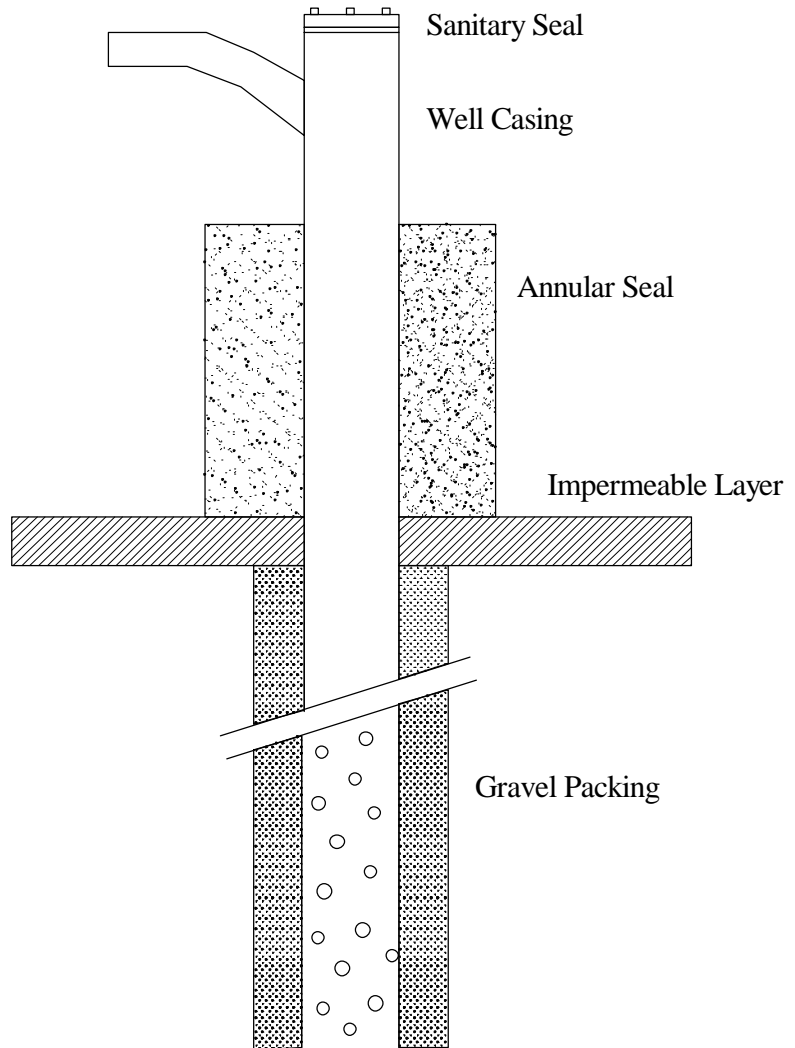
The final well should include further safeguards to protect against surface water intrusion. These include limiting the use of gravel packing near the surface, an extended annular seal, an impermeable layer surrounding the same, and mounded soil around the annular ring (or a sloped concrete cap).

Lastly, we strongly recommend having a sanitary seal installed on the nearby agricultural well to prevent surface water infiltration to the region we draw from.

The committee strongly recommends evaluating further safeguards, to include an impermeable layer between the annular seal and the gravel packing, and the addition of a sanitary seal to the nearby agricultural well.

Note: If a deeper well is not possible as is discovered by the test borings, we will need to implement extended water treatment facilities to include a UltraViolet (UV) system. We would then also have to modifying the existing well to include an impermeable layer, replacement of the pump, an upgrade of the annular seal and the addition of a sanitary seal to the adjacent agricultural well. Although not priced, we expect the costs to be roughly 70-80% of that budgeted for a new well.

A potential source of funding was identified (Source Water Protection Loan Fund). The



application was prepared, requesting a total of \$40,000 and submitted to PLMWC for review and submission using data from Robert Brownwood's report. This potential funding source should not be considered in the budgeting considerations but should be taken to offset future costs should it be approved and granted.

5.3. Alternative Energy

The erection of solar photovoltaics (PVs) and wind turbine has the potential to make our community water system a model for other communities here in California and across the country. It is an exciting prospect and could well serve to temper unexpected energy rate swings.

There are two problem areas with convincing the community to implement an alternative energy source – the raw cost and siting issues.

The cost of such a system as we have described can sound formidable. However, the CEC buys down the price by nearly 50%. In addition, there are many low-interest loan programs available targeted at entities like the PLMWC. The bottom line is that when you consider the energy cost increases just over the past year, then add a nominal 10% per year for the foreseeable future, the investment we make here pays off in the PLMWC energy cost offsets. And since the systems are expandable, as costs (or energy expenditures) warrant, we can continue to expand the system.

One further note about the costs. The system would generate most of the electricity during daylight hours when electricity costs are highest (and our consumption is lowest). PG&E currently buys electricity during this prime period at up to 31-1/2 cents/KWh¹⁰. During our usage period, we would then be buying electricity back at roughly 9 cents/KWh. The net affect is that for every KWh we generate during prime time, it would be the equivalent of over 3KWh hours consumed during our normal usage!

We highly recommend the implementation of a 10KWh system containing both solar and wind components.

The appendices contain the proposed system pricing and a rough drawing of a proposed layout to tank site #3. Note that for budgeting purposes, we have placed this mid-term in our projected budget due to projected energy price surges over the next 5 years.

5.3.1. CPUC's Rulings Impact Us!

After this quotation was requested, it was learned that the CPUC has rules prohibiting the application of credits across several meters (called aggregation) -- even if they are for the same

¹⁰Rates are dependent on time of year as well as time of day.

bill. This is covered under the Enet tariff and Rule 21 from the CPUC, and is currently under review. What this means for us is that we must consider the application of alternative energy at a site that would use at least as much electricity as we could generate in order for us to benefit from net metering (tank site #3 only uses about 8KWh per month).

When we heard about this potential problem, we re-thought the system and determined that solar and wind could still be used but placed along the fence line at the well site. This site would have full exposure to the sun and the wind may be even better than tank site #3. Additionally, there is room in the shed there to mount the interface equipment which would reduce system costs. Easement issues might be simpler since we would be employing a fence line. And some additional maintenance would be required -- primarily in the periodic removal of dust and sulfur following vineyard operations. The quotation still applies, although the attached drawing would have to be visualized in the context of the well site.

5.3.2. The Next Step

In order to proceed with an Alternative Energy implementation, and to benefit from the state rebate programs, we need to do the following:

- 1) Work through the easement issues for the site recommended.
- 2) Get a formal quotation for the implementation, including all construction, permitting, etc.
- 3) Fill out a reservation form, quotation inclusive, and send it to the applicable agencies. This will allow them to process the request and send us the rebate monies ahead of time.

One or more of the members of this committee would be willing (and happy) to do the paperwork for this project as might be desired by PLMWC.

5.4. Other Issues

5.4.1. Upper Palomino Water Pressure

There are three approaches we have identified to potentially address this problem, as follows:

1. Add an in-line variable speed booster pump to increase the pressure to these residents.
2. Add 120 gallon pressure tanks to each residence to boost the pressure locally.
3. Disconnect the service from tank 2 to this group and add a segment from tank 3 in its place.

The lowest cost solution is the addition of pressure tanks to each residence. In this approach, the

PLMWC could simply volunteer the upgrade service, leaving it to the homeowner to determine if they need / want it. This approach does have its drawbacks though – especially in that PLMWC equipment would then be located within community member’s homes.

The approach of adding an in-line booster requires the development of an additional PLMWC site with the addition of another PG&E utility drop, pump housing, electronic monitoring, and other associated matters.

The ideal solution -- one that requires the lowest maintenance cost over the long term – involves moving these residences to tank #3. This is also the most expensive (but not by much). This approach would also have the lowest long-term impact, both cost and maintenance wise. Essentially a 4" PVC line would be connected to the upper side of tank #2, then head south towards 1025 Palomino across the ravine there. In crossing the ravine, a steel reinforced (and concrete-anchored) enclosure would be used to prevent disruption from trees falling on the line, etc. Once at the property line of 1023 and 1025 Palomino, it would follow the fence line down to the existing pipeline at Palomino Road where appropriate valves and connections would be made. By the inclusion of valves, the line can be cutoff (reverted) should problems arise or maintenance be required.

In considering these alternatives, Bill Rege (of Rege Construction) recommended that all home owners be surveyed as to their opinions of their water pressure (with supplemental testing with a pressure gage as necessary), to determine the true extent of the problem and to alleviate the potential of any future problems that may arise if someone feels they were excluded from such considerations.

This committee recommends conducting a survey of community homeowners to determine the full extent of low water pressure before proceeding.

Note:

In the review of this report by the committee, one of the members pointed out some aspects of this issue that need to be given careful consideration. First, based on water laws, we must provide to each metered connection a water pressure of between 30 and 55psi (at the meter service). Before any action is taken, we need to determine if such a pressure range does already exist. If it does, any action to increase the overall pressure delivered to upper Palomino may potentially cause damage to the users’s plumbing across the street (on the lower side). Should PLMWC already be providing sufficient pressure to the meter, the water company’s obligation is complete and it is up to the homeowner to install their own booster to meet their needs. In this case, we may also want to seriously consider backflow prevention devices at these meters as this is a prime scenario for system infiltration!

Should the problem be insufficient pressure to the meters in this area of the community, *the*

committee recommends that the 3rd option be considered. This option has been added to the budget for consideration.

5.4.2. Upper Palomino (and Other) Leakage Possibility

As leaks affect all of us -- both in system costs and the potential for land damage, their existence should be confirmed and the leak repaired. The committee also identified two other potential leaks; one on Oak Knoll Terrace (north of 26805 on the west side), and one at the end of Madrone. These potential leaks are identified by perennially wet ground.

The PLMWC should have a sample of the water collected from each identified potential leak site and tested for the presence of chlorine.

The community should be advised of what potential leaks look like and asked to bring to the attention of PLMWC any others that may be known.

Note that the test lab should advise you on the best sample collection method; but this will probably involve collection in the early morning from an apparent source area and the sample should be kept in a gas-tight container to prevent loss of chlorine if it is present.

5.4.3. Tank #2 Supplemented

The committee agrees that we should supplement the redwood tank at site #2 with a steel tank. In addition, bypass piping should be in place so that if a redwood tank collapses (or any similar problem), the system can operate unimpeded. However, there is the issue of the easement of site #2 and this presents a problem.

One solution here appears to be one that involves replacing the redwood tank with a steel one of roughly 15kgal. In order to accomplish this without interruption to those served by the water system, a temporary holding structure will need to be effected. Frank Crivello suggested the use of a water truck while the old tank was being demolished and the new erected. These factors have been included in the budget considerations.

Should the easement to the site prove to be a problem, we may want to consider a new easement just across the road from the present site. This would add additional costs in the re-routing of the piping, but that may be offset by increased accessibility and space. This issue should be examined in more detail with the community member presently granting the easement on tank site #2.

We recommend the replacement of the redwood tank on tank site #2 with a steel one.

Before a final decision is made on the size of the tank, the CDF (or equivalent authority) should

be contacted regarding storage requirements for firefighting issues¹¹.

5.4.4. Maintenance Items

During the walk-through, it was noted that the pump at tank site #1 was not bolted down. Instead it was simply sitting on a concrete block with the only support coming from the water pipes it was attached to. This arrangement has the potential of causing pipe fatigue and a great loss of water and services. It is recommended that this, and all pumps throughout the system, be reviewed and repaired with mounting flanges. A budget line item has been included for the pump at tank site #1.

Pumps need to be checked to ensure they are securely mounted to their concrete pads ASAP.

5.4.4.1. Predictive and Preventive Maintenance

Based on the insights presented by one of the committee members, a pro-active approach to the water system is encouraged which will compliment long-term budget planning. These include the following suggestions:

- *Monthly* walk-through of the system to look for unusual indications or operation that might indicate impending problems.
- *An quarterly or semi-annual* inspection of the electrical system to include wiring, connection points, the condition of mechanical contacts (motor starter contacts, relays, contactors), etc.
- *A semi-annual or annual* inventory of spares, with an accompanying review of life-projections of critical items (pump motors, impellers, seals, relays and contactors).
- *A semi-annual or annual* flushing of the system to remove sediment and to verify operation of the fire hydrants.

We suggest these items, and any others deemed appropriate, be formulated into a maintenance plan and schedule

5.4.5. Miscellaneous

5.4.5.1. Tank Site #3 Survey, 100kgal Installation

It has been identified that the survey for tank site #3 has not been filed with the county and that the easement issues have therefore not been closed.

¹¹This action should be taken whenever tank upgrades are being considered.

The committee recommends that this matter be expedited to prevent future litigation costs¹².

5.4.5.2. Delinquent Accounts

We recommend that accounts (PLMWC or Neighborhood Association Dues) that are past due over 6 months, that have made no effort for even partial payment or rescheduling, be considered for water restriction¹³ or shutoff. Although this may seem harsh, it becomes exceedingly difficult to collect past due accounts without having some punitive action to fall back upon. If there is indeed a financial hardship, there are services provided by the county the member should apply for that may provide assistance.

We recommend that the PLMWC Board add a warning to this affect to the (quarterly) billing, and to put known delinquent accounts on notice. Further, it is recommended that when a water service is restricted or shut off, that the meter be completely removed (in the case of restriction, that a special meter be used) and the utility tie-point be checked at least weekly to ensure that the altered service has not been bypassed. Lastly, the account should be turned over to a collection agency so as not to unduly burden the PLMWC elected board members' time.

This committee recommends that delinquent accounts over 6 months be considered for shutoff or restriction of service; and that once a service is shutoff or restricted, the tie-point be periodically checked to ensure the service is not bypassed.

5.4.5.3. Higher Efficiency Pumps

Using 3-phase, 480VAC pump motors would increase the efficiency of the pumps, dramatically reducing energy costs and potentially increasing the pump working lifetime. However, the replacement of existing (functioning) equipment would be prohibitive cost-wise. We suggest instead that as pumps are replaced, that the 3-phase 480 VAC versions be seriously considered.

This committee recommends the transition to 480 vac, 3-phase equipment as old equipment needs to be replaced.

5.4.5.4. Tank #3 Residual Chlorine Testing

¹²Tom Mannatt performed the survey. He should be contacted as to completion needs (894.4194).

¹³Restriction of service was described by one of the committee members based on past PLMWC experience. It involves preparing a meter with an plastic plug on the in-feed side, drilled with a 1/8" hole. In this manner, water is still being provided, but with minimal flow.

During our investigations it was noted that since the volume at tank #3 is never completely depleted, chlorine levels may fall below safe levels allowing pathogenic organisms to develop. Periodic testing for chlorine levels needs to be conducted at this site.

We recommend adding the testing of chlorine levels in tank #3 to the periodic maintenance schedule.

5.4.5.5. Source Water Documentation and Monitoring

Due to the ever-changing ownership of the lands around which we draw our water, a periodic tour of the area should be conducted in order to identify potential source water contamination sources. These potential sources should be documented as to their location, the type of potential contamination, and to the time frame they came into being. A case in point is the nearby agricultural well not having a sanitary seal and its potential for communicating surface water contamination into our system. In cases where concern is raised, the Department of Health Services, Drinking Water Division should be contacted for further assistance.

We recommend a minimum of an annual source water assessment to include identifying potential sources of contamination.

5.4.5.6. Long-Term Water Availability

While conducting our review of the water system and the surrounding issues, we became aware of the issue of water rights. With the growth in this and surrounding counties, all water sources are being identified and the total available volume is being used in planning and moderating growth. If the past (or our communities in the southern part of the state) is any indication, more water than is available has or is being allocated. We need to seriously investigate the legal issues surrounding our water usage and the rights to the water we draw for our community. Robert Brownwood mentioned to one member of this committee the aspect of obtaining a water license from the state to legalize our well and community's usage of the same¹⁴. We highly recommend that this issue be pursued. We emphasize that the state is the one to approach, not the Sonoma County Water Agency¹⁵, due to the politics involved.

¹⁴A license is typically issued at the completion of a build-out in accordance with the original permit. It is the final confirmation of a water right as initiated by the permit and remains effective as long as the water remains in the original and beneficial use.

¹⁵The cautionary statement regarding the SCWA is due to their recent actions to acquire all 'underflow' rights regarding the Russian River. When ground waters within 1 mile of the river are not already permitted/licensed, the SWCA has been claiming ownership and placing the user under their control and fee regulation [ref. Eel River Reporter, vol IV, Issue 3, pg 36]

It is recommended that the legal issues surrounding our water rights be investigated and that if a license is available to guarantee these rights, it should be pursued with expediency.

Note that our inclusion of non-assessed users (e.g. Seghesio, etc.) may prove to be problematic when water rights are pursued (since we have granted some of our water rights, potentially in conflict with the original permit). This will need to be researched further.

6. Budgeting Issues

Traditionally PLMWC has operated on a yearly basis, with minimal cash reserves and addressing large repairs or needs through community assessments. What this committee would like to encourage here is more of an outlook on the future, with a focus on identifying potential issues which will impact the water system and the buildup of reserves for the unexpected. It is senseless to tax the members to buildup reserves if the budget process continues to generate the need for assessments

6.1. A Long-Term Budget Approach

An attached appendix to this document includes a spreadsheet listing of the major budget items being considered in this report, as well as both projections for the present year (2001) and for the next 5 years. In preparing the budget estimates, our objectives were to include all suggestions outlined by this report; and to reach both a termination of the existing loan assessment and the projected reserve assessment in five years. This will (fortunately or unfortunately?) Result in a substantial reduction of water rates at the end of this period if no other projects are identified requiring additional funding. More on this in the last sub-section.

As we have mentioned elsewhere in this report, assessments for the suggested items will still need to take place and these amounts are calculated in the spreadsheet. Alternatively, a longer-term budget might be considered so that instead of making such (large) assessments, either the budget could be spread out over a longer period with smaller assessments or long-term, low-interest loans could be taken out. In the latter case, the revised budget would be expanded to include early pay-off of such loan(s) following implementation of the suggested items.

Not included in the budget calculations are the possibility of the Source Water Protection Project Funds becoming available (ref. Application prepared and submitted to PMLWC, 10/29/01).

One item of note regarding loans: there are low-interest loans available for alternative energy installations (typically ~5%) that we qualify for. Should this be a consideration, please ask us for the list. Alternative energy implementation may also qualify us for grants in addition to the rebate program already discussed previously in this document. The basis for such would be the showcasing of alternative energy generation for a community like ours. Let us know if this should

be looked into further.

6.2. Projecting Likely Assessments

As we discussed earlier in this report, it would be ideal if we could project needed assessments such that members of the community can budget for them, as well as to have input on those projects.

By taking a long-term planning approach, expenses can be projected and the need for supplemental assessments determined. With the budget projections this committee has prepared, we have attempted to make such predictions; both in need, and in amount.

It is our recommendation that PLMWC adopt the long term budget approach, and announce expected future assessments in an annual newsletter or report. This is not a difficult task to undertake; and it is a task that provides a certain degree of continuity between elected boards.

We recommend a long-term budget generation (2-5 years), with published expected assessments to the community at large...

6.3. Assessments We Project

The following assessments (and projects) are based on a 5-year budget, with completion of all projects outlined during that time frame. The project time frames are based on system need (or in the case of the Alternative Energy item, projected energy cost increases). Although the projected assessments are relatively large, we (as the community) need to consider such as an investment in our community for the long-term.

One option would be to spread the required assessments over the full 5-year budget period. That assessment figure is presented under the 'Adjusted Assessment' column. When the adjusted assessment is taken into consideration on top of the proposed rate structure changes, we would be paying just slightly more for water than Cloverdale residents on a quarterly basis¹⁶.

<u>Year</u>	<u>Proj Assessment</u>	<u>Adj Assessment</u>	<u>Projects</u>
2001	\$ 396.00 (collected)	N/A	Tank #1 upgrade
2002	\$ 549.37	\$272.10	Well, upper Palomino water

¹⁶\$120.00 (60Kgal) base plus \$66.78 assessment equals \$186.78 vs. \$172.91 for the same quantity in Cloverdale.

			pressure ¹⁷ , maintenance items, reserve development
2003	\$ 467.08	\$272.10	Alternative Energy, reserve development
2004	\$ 344.05	\$272.10	Tank #2 upgrade, reserve development
2005	\$ 0.00	\$272.10	Reserve development
2006	\$ 0.00	\$272.10	30-year loan paid off & reserves fully funded

6.4. After the Fall...

Sorry about the title but it did catch your eye! As we mentioned earlier, following such a budget as we have proposed leads to a point where the assessments are no longer required and a substantial reduction in water billing might be possible. We would like to propose an alternative to letting the rates fall as indicated.

Due to stronger laws governing source water, its availability and its quality, the PLMWC's responsibilities are only expected to grow over the coming years. Martha has already seen this in the new test regimes handed down from DHS, and these are only going to get tougher over the years. In addition, the volunteers in our community that PLMWC has traditionally counted on are getting up in their years and (probably) longing for that long cruise they promised themselves when they retired. Finally, we apparently are required to have a licensed (1st Class) Water System Distribution Operator on board to perform many of the duties we have traditionally performed ourselves – a requirement that may be imposed in the not to distant future.

What we would like to propose is the contracting of the water system out to a firm that has the resources to keep up on the increasing water regulations from the various governmental agencies, and who can maintain the records in accordance. We realize that PLMWC has considered this in the past (re. the Sebastopol firm) and that the costs were deemed too high. In consideration of the increased mandates projected for testing and record keeping, training and certification, as well as the potential drop in water rates, we feel that these costs could be readily absorbed. Should an outside firm be contracted to run the water system, the PLMWC would either continue under an overseer position, or PLMWC would be dissolved and the task of overseeing the outside firm brought under the Palomino Lakes Property Owner's Board.

¹⁷This item may not be required based on further investigations.

The committee recommends that at the end of the projected projects and assessments, that the day-to-day responsibilities and long-term maintenance be contracted to an outside firm.

Appendix A. Rate Adjustment Basis and Calculations

Attached is a spreadsheet with the basis for the rate adjustment calculations and the results. The spreadsheet format was employed such that various rate schedules and other scenarios could be quickly tested. This spreadsheet is available in electronic form upon request.

Attached Documents:

- Rate Calculation Spreadsheet (8 pages)

Appendix B. Well and Related Work Project Costs and Specifics

Attached are the bids from Weeks Drilling for work to be performed on the PLMWC well as well as other portions of the system. Also included are specifications for the pressure tanks and information on re-routing piping for Upper Palomino residences.

Note: we will need to determine the extent of the well site easement in order to plan on where the new well will be drilled. Easements also need to be considered for tank site #2 in order to ascertain the impact of the proposed tank replacement.

Attached Documents:

- Weeks Drilling Estimates (2 pages)
- Pressure Tank Specification Sheet (1 page)
- Upper Palomino Re-Route Map (1 page)
- Rege Construction Underground piping Estimates (1 page)

Appendix C. Alternative Energy Project Costs and Specifics

Attached is the proposal submitted for the Alternative Energy project.

Notes:

1. We will need to determine the extent of the easement at the prospective site before determining the final placement of equipment.
2. Bids should be requested from several possible alternative energy contractors before settling on the final vendor. These bids should be inclusive of permitting, site engineering and preparation as well as construction and testing so that all costs can be submitted for consideration of the rebate.

Potential Contractors (for Bids):

Jonathon Stouman / Soltac, 707.433.3906
Joe Marino / DC Power Systems, 707.433.3946

Attached:

- Soltac Project Estimates (1 page)
- Drawing, proposed equipment siting for tank site #3 (1 page)
- Real Goods Estimate (1 page)

Alternative Energy Equipment Estimate, Real Goods

3KWh wind turbine (Whisper 3000)	\$ 4,990.00
Guyed tower, 80'	\$ 2,500.00
Siemens SR100 PV modules, \$609 each x 70 units	\$ 42,630.00
PV mounts, 10 PV modules each, \$490 each x 7 units	\$ 3,430.00
Poles for PV mount units, \$30 each x 7 units	\$ 210.00
Permits, foundation pads, engineering – PV (est)	\$ 6,000.00
Installation, PV	\$ 5,000.00
Permits, foundation pad, erection – wind (est)	\$ 8,000.00
Trace 4KWh system, \$5,000 each x 2	\$ 10,000.00
<i>Total Estimate:</i>	<i>\$ 82,760.00</i>

Appendix D. Long-Term Budget and Considerations

The following pages present a budget spreadsheet including the current fiscal year, proposed expenditures and a 5-year budget consideration. In preparing this budget, we took the approach of using assessments to meet the goals outlined. Alternatively, the use of low interest loans could be employed, but that creates a long-term debt situation that can be difficult to get out from under. As such, we have included the projected assessment amount in hopes that the PLMWC board will publish these in advance so that community members can plan accordingly. The electronic form of the spreadsheet is available for use upon request.

Attached:

- Budget Spreadsheet (4 pages)

Appendix E. System Information and Data Sources

The committee wishes to thank the current PLMWC board members, Frank Crivello, Gary Johnson and Martha Vuist-Bruske for their information, advice and assistance. We would also like to thank former PLMWC board member Russ Armstrong for his invaluable insights.

Data regarding the State's assessments and much of the historical information for our well and water system came from the report issued by Robert Brownwood (Santa Rosa Field Office, Department of Health Services, 707.576.2145) dated July 16, 2001.

Our System Info:

Per Brownwood:

Our system is designated as System #4900570
Our water permit is #02-18-01P-4900570
Our well is designated as station #11N/10W-28K01 M

Per Mr. Kenyatte (Water Resource Control Board, Division of Water Rights)

Our well permit application, filed on 9/29/75 was #AO24890
The final well permit, granted 4/6/78 is #017247
We are granted a maximum annual use of 182 acre-feet (1 acre-foot = 325,851 gal, therefore 59 million gallons), with a maximum pumping rate of 0.432 cfs (1ft³ = 7.48 gal, 190gpm =~0.422 cfs).

Internet-based Information Sources:

<http://www.dhs.cahwnet.gov/ps/ddwem/index.htm> -- Department of Health Services, Drinking Water Division – source for water testing requirements and safe levels of contaminants as well as rules and regulations governing water systems such as ours.

<http://www.waterrights.ca.gov> -- Water rights issues and water licensing

<http://www.calruralwater.org> -- Membership organization with equipment and training benefits

<http://www.consumerenergycenter.org/buydown/index.html> – Renewable Power Buydown Program

http://www.pge.com/002_biz_svc/selfgen – PG&E Self Generation Incentive Program

<http://www.cpuc.ca.gov/static/contactus/index.htm> – California Public Utility Commission

<http://www.sonoma.edu/users/n/norwick/document/> – Sonoma County Ground Water Resources (Geology/Hydrology report that the county’s planning is based upon)

River Issues:

Eel River Reporter; published by Friends of the Eel River, Redway CA, 707.923.2146 – available at the local health food store as well as many other locations.

Appendix F. Executive Summary

This appendix lists the issues we evaluated and a summary of the proposed resolutions as prepared by this committee and elaborated on in this document. The summary has been included here, in the appendices, to provide a higher degree of readability for the document as a whole (i.e. to allow it to be removed without impacting the document).

F.1. Rate Restructuring

Rate restructuring addresses 3 issues: 1) encouraging water conservation, 2) increasing revenue from high water usage to cover rising maintenance and energy costs, and 3) the buildup of fund reserves.

Spreadsheets were prepared (and are available) to evaluate current usage and billing, equivalent billing for Cloverdale residents, and to evaluate potential rate structures.

We recommend the following:

- Lower the base usage amount to 60,000 gallons
- Change the base charge from \$0.82 to \$1.00/Kgal
- Add a reserve assessment figure to the billing
- Institute progressive rates in increments beyond.

The average homeowner in this community will see a \$10 increase (\$28.82 across all members during the peak usage period). Assessments for outlined projects will still be required.

F.2. The Source Well & Pump

Everyone we discussed this issue with agreed – the well needs to be deeper, if possible, to protect us against surface water infiltration and for reduced water availability in the future. If we don't take action ourselves, it may be forced upon us in the near future.

Weeks Drilling has proposed using a test boring approach to allow us to quickly ascertain several potential sites quickly at a low cost (under \$2000). We need to research the easement issues for the land as well as water rights issues.

We recommend that a new well be drilled to at least 50' depth, and that the greatest protection from surface infiltration be provided in the well construction through the use of impermeable layers, etc. (as described in the body of this report). In addition, the nearby agricultural well – which PLMWC had put in (in exchange for easement rights?) – must have a sanitary seal installed to stop direct surface water infiltration to the region we draw from.

The new well should be configured with a new 480VAC 3-phase pump and motor and should be plumbed with the existing well (to include a valve) so that the old well and pump can serve as a backup.

F.3. Alternative Energy

At the current rates, electricity accounts for approximately 15% of PLMWC's costs. Based on a 10KW system of 70% solar and 30% wind, we could generate 20% of our electricity. Since most of this would be generated during the peak PG&E billing hours, this electricity would be purchased at up to \$0.315/KWh. Compared to our consumption at around \$0.10, this extends further the value of what we generate (e.g. up to 50% of our consumed). With the state offering rebates of up to 50% for the cost of the system, including installation, the system could pay for itself in approximately 10 years. Since energy are expected to continue to rise (with commercial oil slated to decline in production between 2004 and 2008), we would be foolish not to pursue offsetting such costs.

We have prepared a proposed system that would be sited at the well site. The system would be expandable for future considerations. The committee strongly recommends implementing this proposal.

F.4. Tank Site #2 Upgrades

Due to the tank at site #2 being constructed of redwood and subject to the same factors leading to tank #1's demise, we recommend replacement with a steel tank of equal or larger size.

The current easement may not allow us to co-situate another tank at this site so we will have to consider either the in-situ replacement or negotiating an easement across the road. The easement issue will have to be pursued further. Before the final tank size is determined, the CDF should be consulted regarding their desires over water storage quantities.

F.5. Upper Palomino Water Pressure

A survey needs to be conducted in the upper Palomino Road area to determine the extent of the problem. Where low-pressure is cited, the water pressure needs to be measured at the meter to determine if the pressure is satisfactory there. If so, PLMWC's obligation is complete.

If there is indeed insufficient pressure, the best solution is the re-routing of that segment onto tank #3. Within the body of this document is the proposed routing and costs.

F.6. Delinquent Accounts

Delinquent accounts impact the entire community. We recommend the restriction or removal of water delivery if billing goes due over 6 months.

F.7. Potential Water Main Leakage

Several sites were noted with potential leakage as denoted by the year-round presence of water at the surface. These sites should be investigated through the use of a chlorine test kit to determine if the wetness is indeed caused by leakage.

F.8. Tank #3 Issues

F.8.1. Survey Not Filed

The surveyor should be contacted and the easement survey filed as soon as possible.

F.8.2. Residual Chlorine Levels

As tank #3 is never completely depleted, the chlorine level needs to be tested periodically to ensure sufficient levels are present so as to prevent any associated health risks from potential organism growth.

F.9. Preventive and Predictive Maintenance

F.9.1. Schedules

Scheduled maintenance needs to be reviewed and augmented to reduce the potential of more serious problems due to loss of equipment or reduced water quality.

F.9.2. Un-Secured Pumps

Flanges need to be constructed and installed as soon as possible for the (2) unsecured pumps noted during our walk-throughs.

F.9.3. Higher Efficiency Pump Motors

As pump motors need to be replaced, they should be upgraded to 480VAC 3-phase units to reduce operating costs.

F.10. Water Issues

F.10.1. Source Water Contamination

Periodic investigation of lands surrounding our well need to be carried out to identify potential sources of groundwater pollution.

F.10.2. Water Rights

PLMWC needs to investigate and obtain full licensing of our water rights with the greatest expediency. Debra Colvard has made a preliminary contact with the state (the Water Resource Control Board, Division of Water Rights), speaking with a Mr. Kenyatte. He noted that we are permitted to up to 182 acre-feet per year and didn't feel a license was necessary. However, in light of the Sonoma County Water Agency's on-going actions, it would be wise to apply for a license anyway.

F.11. Budgeting Issues

This committee took the issues we investigated and requested quotations on all items we deemed necessary or highly desirable for implementation. These were placed into a spreadsheet (available) along with annual expenses and revenues (with consideration of the proposed rate restructuring). A 5-year budget plan was then created for consideration by the board.

The 5-year budget includes not only the projects detailed in this report, but also the build-up of one year's reserves and the payoff of the existing 30-year loan.

From this budget, expected assessments were also computed and are itemized in the spreadsheet and this report. Considering the necessity of many of these projects, and the marked improvement to PLMWC they will bring, we feel these assessments, as necessary as they are, are a small price to pay.

At the termination of the 5-year budget, PLMWC will be faced with a decision to let water rates drop once more (projected to fall by nearly half). We are instead recommending – due in part to increasing state water regulations – that the operation of the water system be then subcontracted out to an outside firm.

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