

ORIGINAL



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Sheila Stoeller

RECEIVED

From: stewartvoice [stewartvoice@npgcable.com]
Sent: Friday, June 15, 2007 2:55 PM 2007 AUG -1 P 12: 10
To: Sheila Stoeller
Subject: Fw:

AZ CORP COMMISSION
DOCKET CONTROL

Attachments: K2 WATER REPORT.pdf

0362

W-03512A-07-0301



K2 WATER
REPORT.pdf (4 MB)

Dear Ms. Mayes,

I live in Strawberry. At water meeting on June 13, the Strawberry residents noticed that we had no representation on the K2 well issue. We were advised that the ACC would represent us so now I'm writing. This water report shows the invironmental issue on how the well could impact Fossil Creek, and the reasons why it would be better to drill in Pine.

Do you provide legal council on the water issues? We need help since Pine Water wants to own the water from the well in Strawberry. There isn't anyone on the board to represent us. One person on the board told us that if we tried anything, "they'd bring out the big clubs." I guess our money from Strawberry has paid for the legal advice, and whatever Pine wants to do with the Strawberry well.

Brooks utility was just paid \$250,000 by a developer to assure water to thirty more homes here. Our water pressure got low twice, and they've been trucking in water. There are some of the things that concern me:

1. Brooks isn't keeping up with repairs. Twenty percent of the water is being lost in the ground from leaks in the pipes. Some of the old pipes are asbestos.
2. The residents used thirty million gallons of water, yet there are fourty million gallons of water missing. Where are the ten million gallons.
3. My daughter and I saw water gushing out of the ground. It took Brooks a week to get to the location. It created a big pond at the bottom of the hill.
4. There are four wells in Pine that can produce enough water to last them for one-hundred years, yet they are using good money to do a risky venture. Brooks will not take any risk.
5. They can't convince me that this well won't effect the water we use from level C.

We need representation. We don't want corporations and other communities to take our water. I think if we patched the leaks, they didn't ship out our water, and they put a moritorium on new hook ups; we might be able to get by here with our own water. Please help us.

Sharon Stewart
HC 1 1308
Strawberry, Arizona 85544

866-583-1973
602-402-9071

Arizona Corporation Commission
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HIGHLAND WATER
RESOURCES CONSULTING Inc.

Water Resources Solutions

May 30th, 2006

PSWID
Attn. Wes Surh
P.O. Box 134
Pine, AZ 85544

RE: K2 Well Site Evaluation -- Groundwater Resources Potential

Dear Mr. Surh,

Upon the May 18th, 2006 approval and direction of the PSWID board, Highland Water Resources Consulting Inc. (HWRC) has completed its evaluation of the groundwater resources potential at the "K2" well site. The K2 location was considered in light of the local structural geology and both the deep regional and shallower perched groundwater systems. The evaluation focused on the structural geology in the vicinity of the site via a photo lineament analysis. Additionally, data presented in recent publicly available reports of the SHDWID, PSWID, USGS, and ADWR were considered as well. The ongoing Mogollon Study "MRWRMS" has produced a few draft documents of late and is currently wrapping up. However, preliminary data of the MRWRMS available to the public is also considered. The findings of the K2 investigation are presented in this five page letter report.

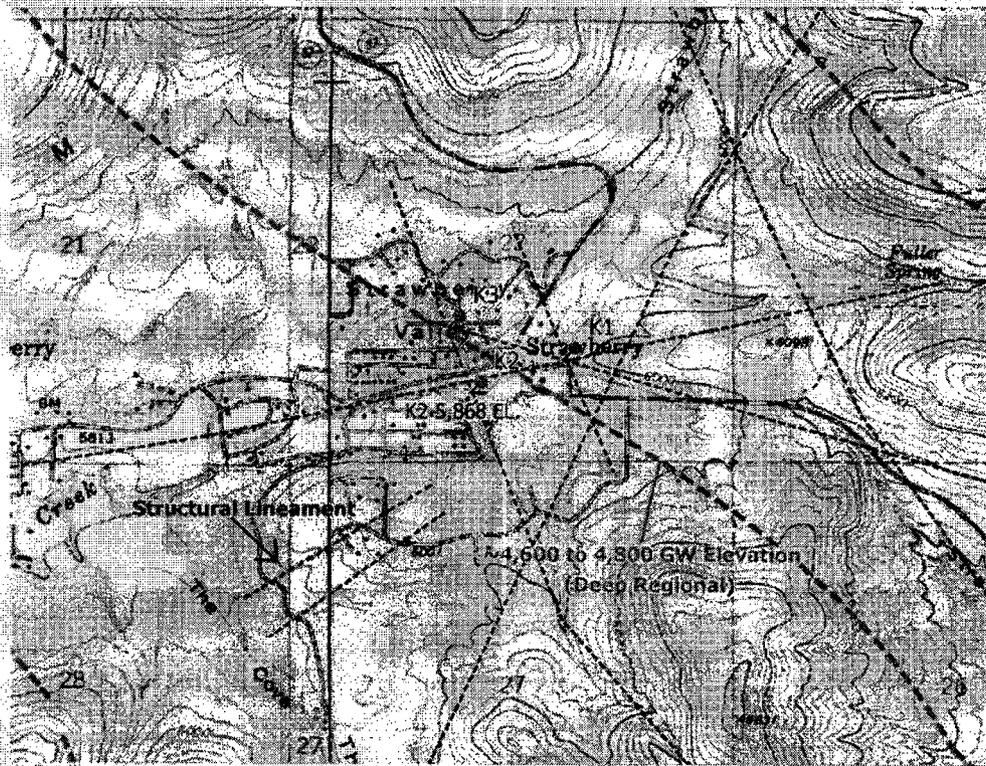
K2 WELL SITE LOCATION

The K2 well site is located in eastern Strawberry at an old water distribution site currently owned by Brooke Utilities. The site is located at approximately N34 ° 24.388 W111 ° 29.712 at a surface elevation of approximately 5,868ft. An existing old shallow production well at the site (55-616681) is reportedly a "dry hole".

K2 WELL SITE EVALUATION - GROUNDWATER RESOURCES POTENTIAL

Upon review of existing data and the completion of a lineament analysis of the site HWRC is confident that the location is quite adequate for the drilling of a deep test and/or production well. Figure I below, displays the results of the lineament analyses. Numerous structural features exist in the vicinity of the K2 site and at other sites to the north and northeast herein referred to as optional sites "K1" and "K3" for consistency. The existence of such structural features indicate a higher probability for the presence of secondary permeability (fractures) in the geology below. This situation would enhance the groundwater production potential within the deep regional aquifer.

FIGURE I - K2 Area Lineament Analysis



It is anticipated that the groundwater elevation of the deep regional system will be found between 4,600ft. and 4,800ft. (1,260ft. - 1,100ft. depth to water) in the vicinity. If a well is drilled in this area it is anticipated that the Redwall Fm. would be entirely to partially saturated. However, the primary producing geology may be within the Martin Fm. thru the Tapeats sandstone and into the Precambrian basement rocks at depths below approximately 1,460ft. These strata should be saturated in this area; in this respect, drilling to a depth of approximately 2,000ft. ought to be sufficient to determine the level

of groundwater production encountered and penetrate a significant section of the deep regional aquifer. It should be noted that the deeper the well is installed the higher the groundwater elevation may rise due to the potentially semi-confined nature of the Precambrian system in this region. Also notable is that the Redwall (where productive) is producing an extremely fine red sediment and that the Tapeats and Martin may be producing sand. This situation can require more costly well construction via necessity for filter pack and well screen or surface filtration in combination with a down-hole sand separator. This issue also will add to the life cycle costs of the well and equipment. It is currently unclear if the sediment concern is a localized issue or a regional characteristic of the deep regional aquifer.

The upper 1,000ft. of strata encountered in the subject area is anticipated to consist of the Schnebly Hill and Supai formations and into the upper Naco Formation. Of consideration is the groundwater that will be encountered in this sequence as "fringe" C-Aquifer groundwater. Perched producing zones within this system occur within thin saturated sandy lime layers and fracture systems. These small systems may be interconnected w/o proper well construction resulting in vertical gradients in the well. In consequence, it is recommended that any wells installed in the Strawberry area deeper than 400ft. be constructed to utilize these aquifers discretely. HWRC believes that there is a lowermost unit of this upper system not currently utilized in the Strawberry area, as it would likely be encountered between 700ft. and 1,000ft.. The potential yield of this lower perched aquifer unit is unknown. Therefore, upon encountering this zone it is recommended that the yield of this unit be quantified and isotope and chemistry samples be collected prior to casing and grouting it off from the deep regional aquifer and perched units above. The potential exists that sufficient groundwater production could be encountered from this lower unit such that drilling need not necessarily continue. If this situation were to occur, proper well construction and provisions for the potential future deepening of the well could be made.

RELATIONSHIP TO FOSSIL SPRINGS and THE DEEP REGIONAL AQUIFER

Fossil Springs exist approximately five miles to the west-northwest of the K2 area. This fact should be considered in light of the reality of water rights and environmental concerns relating to any significant (200gpm plus) wells constructed in the deep regional aquifer in the Strawberry area. This too should be considered as part of the risk of investing public funds into such a project. HWRC currently believes that the subject K2 area may not be within that portion of the deep regional groundwater flow system supporting Fossil Springs. However, the exact location of the springs "capture" area is not clearly defined and the complexities of fractured groundwater flow occurring in the deep regional system may never be completely understood. Other than for monitoring purposes, the installation of deep regional groundwater wells much further to the west of the K2 area is not recommended. HWRC believes that sufficient data currently exists indicating that deep regional groundwater wells installed to the east, in Pine, would not produce groundwater that otherwise would have discharged at Fossil Springs. As such, deep regional groundwater wells installed in Pine are less likely to be the subject of

potential future litigation regarding water rights or environmental issues surrounding Fossil Springs. Another benefit to the drilling of deep regional groundwater wells in Pine rather than in Strawberry is the cost savings that would surely be observed due to shallower well construction requirements in the Pine area.

SUMMARY AND RECOMENDATIONS

HWRC recommends site K1 as the optimum drilling site in the K2 area. However, HWRC is confident that each of the sites in the K2 area provides adequate opportunity for deep and perched groundwater production. Additionally, opportunity for new groundwater production from a currently unutilized lower perched aquifer is a potential at each site. This affords an option in the completion of a potentially shallower well if sufficient production is encountered within or above the Naco Fm. (above approximately 1,000ft. in depth).

A caution should be taken when considering the drilling of deep regional aquifer wells in the Strawberry area as water rights and environmental concerns may arise if significant production capacity is committed. With this in mind, many opportunities currently exist in the Pine area for development of the deep regional aquifer at a significantly lower cost and risk than in Strawberry. This is due to the fact that wells in Pine need be installed to depths typically less than 1,500ft. to fully penetrate the deep regional system vs. greater than 2,000ft. in Strawberry. So too, deep wells in Pine are further from Fossil Springs and existing data clearly indicate such wells would not capture groundwater that would otherwise have discharged at the springs. The K2 area may not capture groundwater that would otherwise discharge at Fossil Springs, but this cannot currently be confirmed. Additionally, current events in the Pine area surrounding the development of the deep regional aquifer point to opportunities for partnerships with other water improvement districts and private entities that currently have wells in place and/or have tentative plans to drill.

In light of all the findings above, HWRC recommends that the K2 site be drilled once the following lower risk opportunities are explored where the water is needed.

- Conduct a hydrogeological investigation to identify at least three optimum deep regional aquifer drilling sites in the Pine area. Such an investigation should include recommendations as to the most efficient and cost saving well drilling methods as well as site specific yet practical well design criteria. Ideally, at least one of the sites may be drilled and tested in 2006.
- Explore and define the opportunities for partnerships with other local Domestic Water Improvement Districts and/or private entities which may currently be in possession of deep regional groundwater supplies or that may be considering the drilling of a deep regional groundwater well in Pine.

- Explore and define the opportunities for partnerships with Federal and/or County governments.
- Explore and define the opportunities for any combination of the partnerships above.
- Prioritize the resulting opportunities.
- Investigate the legality of any such potential arrangements and define a legal path to successful delivery of the new long-term water source to the community of Pine in the most feasible manner possible.

HWRC does not wish to diminish the opportunities presented by the K2 area as it appears to be a good location. Rather, HWRC wishes to recommend consideration of the K2 site alongside other existing opportunities. The K2 area may best serve as an augmentation supply for the Strawberry area as apposed to a new source for Pine. In this way, the costs born by Pine's water customers for the distribution of the water from great depths and over the distance from Strawberry to Pine may be avoided. In addition, such a scenario would ensure that existing resources available to the Strawberry area are preserved. Ideally groundwater from the lowermost perched aquifer may be identified at the K2 site in sufficient quantities. If this zone were slated for future reserve development in Strawberry as apposed to the deeper system in Strawberry, potential water rights and environmental questions may be averted while providing for the utilization of the K2 area at some time in the near future.

Respectfully Submitted,

Michael Ploughe P.G.
HWRC



HIGHLAND WATER
RESOURCES CONSULTING Inc.

Water Resources Solutions

1/5/07

Mr. Ray Pugel
Milk Ranch, LLC.
P.O. Box 189
Pine, AZ 85544

RE: 7 Day Pumping Test Results and Long-term Yield Projections: Short Report on the successful testing of the Milk Ranch LLC Well #55-210454 in Pine, AZ.

Dear Mr. Pugel,

An evaluation of the well pumping test data collected during HWRC's November 11-18th 140 gallon per minute constant rate discharge test of the new well #55-210454 has been concluded. The 1,045 ft. well was pumped at a relatively constant rate of 140 gallons per minute from a static water level of 523.68ft. for over seven full days (10,440 min or 7.25 days) with recovery monitoring another nine days (12,895 min or 9 days). In total, a minimum of 1,461,600 gallons of groundwater was produced from the well over the 7 day period. In short, the well performed very well and certainly within its long-term sustainable yield. Based on HWRC's past experience with a successful 100 year water adequacy filing for Strawberry Hollow, also in the Pine area, going forward with an ADWR application for an adequate 100 year water supply designation application is most confidently recommended, when appropriate. Truly, this well is a far better performer than the other 100 year source now approved by ADWR in Pine. For your more detailed consideration, HWRC is happy to provide the following summary of the testing results.

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The maximum drawdown observed during pumping was 155ft. and occurred during a period when the well was developing and groundwater flow into the well may have been restricted due to sediment. Pumping water levels appear to be relatively stable around 665ft. (~130ft. of drawdown) when pumping 140-150 gallons per minute. This pumping level at 140gpm yields a specific capacity 1.1gpm/ft of drawdown. Based on passed performance at higher rates (see September 25th, 2006 Report) and fact that the well continued to develop during this test, it appears that the well is capable of at least twice the pumping rate utilized for the 7 day testing (~300gpm). Still, due to the well's ongoing development (sediment concerns), frequently pumping at rates above 150gpm are not recommended at this time. Future efforts to develop the well could result in a higher performance levels and justify further testing at a higher rate. Please see the "Water Levels vs. Time", "Drawdown vs. Log Time with trend explanations", and "Drawdown vs. Log Time" Figures attached.

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Long-term Sustainability

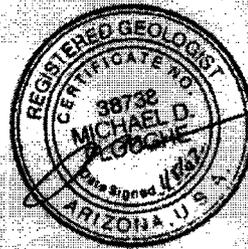
Drawdown data collected has been projected to beyond 100 years via standard methods accepted by ADWR. Observed, drought level, and anticipated long-term drawdown projections are presented. Assuming no recharge and that pumping were to continue non-stop, the well is capable of providing a 100 year adequate water supply at 140 gallons per minute, even during drought periods. For perspective, 140 gallons per minute is sufficient to serve 350 homes at peak demand in the Town of Payson. More realistically, the well could serve up to as many as 700 homes based on a conservative annual average demand of 120 gallons per capita per single family residence. Please see the "140gpm Sustainability Projections" Figure attached.

In summary, HWRC wishes to congratulate Milk Ranch LLC in their success. Previously untapped water resources have always been in existence in Pine but this fact has historically been publicly discounted by local water providers and even government entities. The myth of "there is no water in Pine" has now, without a doubt, been proven to be exactly that, a myth. The Milk Ranch well reaffirms the reality of a previously untapped water resource as recently identified at Strawberry Hollow. Again, HWRC is proud to have been a part of both of these efforts and anxiously looks forward to further assisting you and others in the future. Because this is such an important project a future comprehensive hydrogeologic study report is recommended to support your future application for water adequacy and document more of the details of the effort. Also, please note the photo section at the end of this report as further documentation of the 7 day testing effort. Video is also available.

Please contact me at 928-970-9055 cell or 928-468-0252 should you have any questions. Once again, thank you for allowing me to be a part of this success story.

Regards,

Michael Ploughe P.G.
Highland Water Resources Consulting Inc.



HIGHLAND WATER
RESOURCES CONSULTING Inc.

Water Resources Solutions

May 30th, 2006

PSWID
Attn: Wes Surh
P.O. Box 134
Pine, AZ 85544

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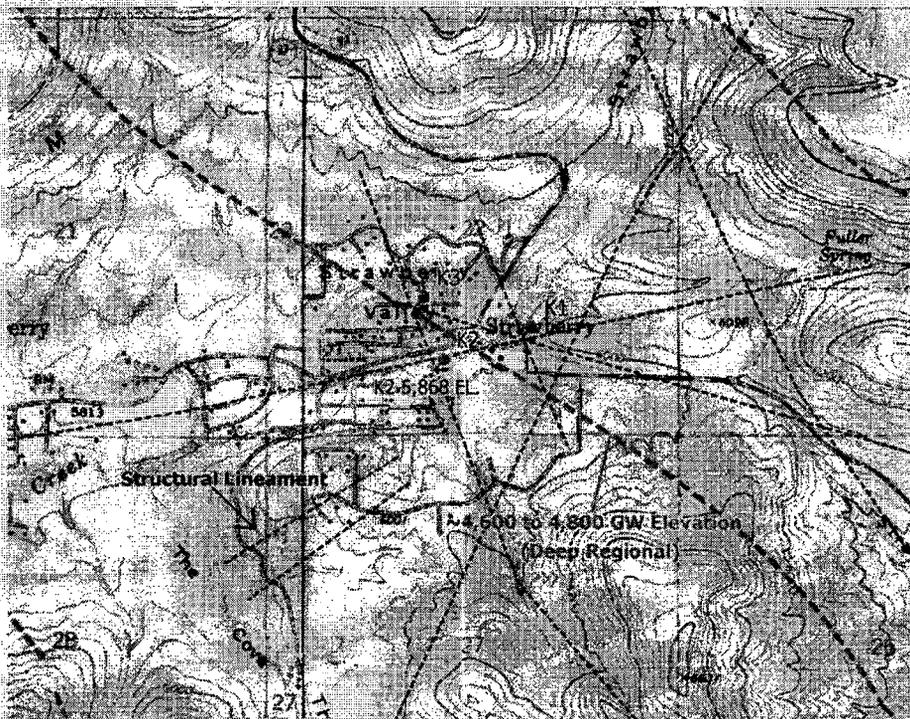
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During the September stepped pumping test "new source" drinking water quality samples and isotope samples were collected. The water quality results indicate that the groundwater is of excellent quality and therefore is in compliance with all EPA standards for potable water supplies. As expected, the isotope data collected indicate that the groundwater is a blend of locally recharged water and the deep regional aquifer system with a Tritium value of 2.9, $\delta^{18}O$ -11.6‰, and δD -76‰. See ADEQ New Source results forms attached.

Long-term Sustainability

Drawdown data collected has been projected to beyond 100 years via standard methods accepted by ADWR. Observed, drought level, and anticipated long-term drawdown projections are presented. Assuming no recharge and that pumping were to continue non-stop, the well is capable of providing a 100 year adequate water supply at 140 gallons per minute, even during drought periods. For perspective, 140 gallons per minute is sufficient to serve 350 homes at peak demand in the Town of Payson. More realistically, the well could serve up to as many as 700 homes based on a conservative annual average demand of 120 gallons per capita per single family residence. Please see the "140gpm Sustainability Projections" Figure attached.

In summary, HWRC wishes to congratulate Milk Ranch LLC in their success. Previously untapped water resources have always been in existence in Pine but this fact has historically been publicly discounted by local water providers and even government entities. The myth of "there is no water in Pine" has now, without a doubt, been proven to be exactly that, a myth. The Milk Ranch well reaffirms the reality of a previously untapped water resource as recently identified at Strawberry Hollow. Again, HWRC is proud to have been a part of both of these efforts and anxiously looks forward to further assisting you and others in the future. Because this is such an important project a future comprehensive hydrogeologic study report is recommended to support your future application for water adequacy and document more of the details of the effort. Also, please note the photo section at the end of this report as further documentation of the 7 day testing effort. Video is also available.

Please contact me at 928-970-9055 cell or 928-468-0252 should you have any questions. Once again, thank you for allowing me to be a part of this success story.

Regards,

Michael Ploughe P.G.
Highland Water Resources Consulting Inc.

