JAMES A. SEWELL & ASSOCIATES

Consulting Engineers

NEWPORT OFFICE
Civil Engineering ·Land Surveying · Building Inspection
600 4th Street West
Newport, Washington 99156
(509) 447-3626 (509) 447-2112 FAX
(208) 437-2641

Spokane Office
Electrical & Civil Engineering
9 South Washington Street, Suite 708
Spokane, Washington 99201-3718
(509) 747-5794 V (509) 747-5798 FAX

SANDPOINT OFFICE
Building Inspection
Pend Oreille Professional Center
30336 Highway 200, Suite C
Sandpoint, Idaho 83864
(208) 263-4160 (208) 263-5229 FAX

Civil Engineering ● Electrical Engineering ● Land Surveying ● Building Inspection

October 27, 2004

C:\ajmo1\Projects\SR\HVR\Phase II\well\IPUC Well#2 report.doc

Idaho Public Utility Commission
472 W Washington
P.O. Box 83720
Boise, Idaho 83720-0074

Attn: Jean Jewell
Commission Secretary

SUBJECT: Stoneridge Utilities
SWS-W-~~03~~ 04-1

Dear Commissioners:

CDS Stoneridge Utilities is proposing that the loan from DEQ for interconnecting the drinking water systems of Happy Valley Ranchos (HVR) and Stoneridge be increased to cover additional costs for improving the reliability of the combined system. The previous loan amount (approved 6/23/04) was $359,297 and the estimated revised cost for completing the same scope of work previously approved is now $428,500. The majority of the cost increase is for constructing a new well to replace Well #2. In the June 2004 budget, the plan was to rehabilitate the existing well so that it could continue providing 600 gpm. After investigating this alternative thoroughly, it was found that the well could not be rehabilitated to provide an adequate supply. The new plan is to drill a new well that will provide enough flow to match what previously was provided by Well #2 (600 gpm).

Background

In correspondence this last June, which was submitted to the IPUC as part of the support documentation for the Phase II work, the IDEQ has told Stoneridge Utilities that the utility must have automatic backup of the source pumps. Since that time Stoneridge Utilities has found that the work needed to complete the project was greater than originally anticipated. Originally the plan called for the replacement of the pump in well no. 2; since that time it has been determined that well no. 2 must also be replaced.

The preliminary investigation of methods to rehabilitate Well #2 has been completed and various options studied. Originally, Well # 2 was capable of pumping 600 gpm at a TDH of 420 feet.

The line shaft pump in Well #2 has not worked correctly for many years. The motor would heat up quickly and could only be operated in the manual mode with a full time operator present. Phase 2 of this Stoneridge/HVR Project was to replace the pump, motor and starter panel. When the contractor tried to pull the pump with the derrick mounted on a pick frame, the pump became lodged and could not be removed. A large crane was brought in and the pump was successfully removed. A TV camera was brought in to determine why the pump became lodged in the well. The camera showed the water table at 91 feet down. At 108 feet down the remains of the original plastic screen were found wedged in the well, within the 10 inch casing.

The original well had been drilled to 144 feet with a plastic screen set between 144 and 124 feet, and the 10 inch casing had been pulled back to approximately 124 feet. Some time before the pump was set last time; the screen had been hooked and pulled up in the well. When the pump was last set in the well, the screen became lodged at the 108 foot level. The well has probably collapsed below the bottom of the casing at 124 feet.

The normal way to repair the well would be to advance a new 8-inch casing inside the existing 10-inch casing. In this manner, the well would be dug back to its original 144 feet depth. The well would be dug utilizing a new 8-inch casing inside the existing 10-inch casing. The casing would be advanced to the bottom of the well at 144 feet. Then a 20 foot long telescoping stainless well screen would be set at the bottom of the well and the 8 inch casing withdrawn to an elevation of about 124 feet. A submersible pump and motor would be set inside the well casing, with the pump intake just inside the bottom of the casing. The 8-inch diameter of the well casing limits the size of pump and motor that can be installed in the well. In the case of the 8-inch casing, the motor would need to be less than 7 inches in diameter. The maximum pump and motor that would meet these criteria would be a 60 horsepower motor coupled to a pump that would discharge 415 gpm at 420 feet of head.

<u>Options</u>

This first option was rejected because it reduced the dependable system capacity below what is necessary to assure the customers of Stoneridge Utilities an uninterruptible supply of water. The May 8, 2003 engineering report contains calculations pertaining to the required capacity of the sources of supply to the water system. Appendix 7 of the report calculated that the Average Daily Demand (ADD) for the design of 710 Equivalent Residential Users (ERU) was 527 gpm. At that time the sum of all the pumping capacity of all sources less the capacity of the single largest source was 600 gpm. (The two sources were 600 and 800 gpm).

This calculation shows that the system could easily continue to provide the normal (average) amounts of water necessary to the residential customers with the largest well out of service. If the rated supply of water to the system to serve the normal demands is less than 527 gpm, then additional sources are going to need to be developed. This criterion is used because the ADD is the normal demand on the system which can be expected at all times. The loss of the use of a pumping source is to be expected at anytime, though hopefully it will not occur. The failure could be to any of the pumps, so to be conservative; it is assume to occur to the single largest pumping source. Such a failure is normal and should be planned for to limit the disruption of service to the water system customers.

A second option would be to install the screen similar to the first option above, then the 8-inch casing would be completely removed, and a packer (a device to seal between the 7.5-inch screen and 10-inch casing) would be advanced on the end of the drill rod and then screwed onto the new screen at a depth of 124 feet. Attaching the large packer to the screen is not guaranteed to work and could end up destroying the screen and not seal the well. If the method of developing the well were successful, then a larger pump and motor could be installed in the sell. With the larger well casing, the maximum size pump and motor would be capable of discharging 600 gpm at a TDH of 420 feet. This pumping rate is nearly equal to the hydraulic capacity of the new screen, thus maximizing the yield of the well.

The third alternative is to drill a new well in the same well field. The new well would be sized to produce as much as the other source well (800 gpm). This well would have a 16-inch casing, with a 125 horsepower submersible motor driving a pump capable of discharging 825 gpm at a TDH of 420 feet. The existing 10-inch well would be turned over to the golf course and at some future date Stoneridge could repair the well. The estimated 400 gpm from this rehabilitated well would meet about 80% of the average irrigation demand. If the golf course did not want the well, it could be abandoned at a cost of about $5,000.

A fourth option is to use the existing Well No. 1, utilize the rehabilitated Well No. 2 (the 8-inch well option) and drill a third 8-inch well. The total pumping capacity of the three wells in Option 4 would be 1,630 gpm (Well No. 1 = 800 gpm, Well No.2 = 415 gpm, and Well No. 3 = 415 gpm) and the water supply available to supply the system with the single largest well out of commission would be 830 gpm, more than the 527 gpm required to provide for the normal usage of all the residential customers.

A fifth option is drilling a new 10" well to provide about 600 gpm. This would provide an adequate second source for most situations based on the recommendations in the May 2003 engineering report. There is a cost savings of $ 27,000 over the cost of constructing a new 16-inch well and the supply should be adequate for the 20-year design.

The table below summarizes the various options and estimates the cost of each option:

		Well # 2				Well # 1
Item	Units	Rehab. Existing well	Rehab. Existing Well	New Well	New Well	
Casing Diameter	inches	8	10	10	16	12
Screen Length	feet	20	20	20	20	
Screen Diameter	inches	7.5	7.5	9.5	16	
Screen opening	inches	0.04	0.04	0.04	0.04	
Screen Capacity @0.1 fps	gpm/ft	26.97	26.97	34.16	42.71	
Screen capacity	gpm/20 ft	539	539	683	854	
Pump TDH	ft	420	420	420	420	420
Pump rating	gpm	415	600	600	825	800
Pump diameter	inches	6.5	7.5	7.5	9.8	
Pump Power	hp	60	75	75	125	125
Cost of well drilling		$ 13,000	$ 18,000	$28,000	$ 50,000	
Cost of pump		$ 25,571	$ 30,000	$30,000	$ 35,015	
Cost of structure, wiring		$ 2,000	$ 2,000	$10,000	$ 10,000	
Contingency						
Total Cost		$ 40,571	$ 50,000	$68,000	$ 95,015	

The first option reduces the capacity of the smallest well supplying the Stoneridge system, effectively reducing the system source from 600 gpm to 400 gpm. The second option preserves the current system capacity, but carries significant risks that it cannot be successfully completed and would incur considerable expense as well as still requiring that a new well be drilled. The third option would increase the system source supply from 600 gpm to 800 gpm. The fourth option would provide more capacity than required to serve the 20-year design population and the cost will be comparable to the cost for the new 16-inch well (Option 4).

It is recommended that Stoneridge proceed with the fifth option, the construction of a new 10" well and installation of a 600 gpm pump if the funds can be found to finance this cost. The next best option is to proceed with the first option. This would require the least money now, but would require that a third well be developed in the near future, or the capacity of the water system would be reduced by 33% and potentially causing the water system to restrict full delivery to all the current customers when the largest pump was out of service.

Revised Project Costs

The original HVR project as described in the May 8, 2003 report had an estimated budget cost of $213,450. Construction is nearly completed on that project (Phase I) and the final budget is $275,000. The Phase I improvements are to serve the HVR customers only. These increases are due to extra costs associated with Right of Way acquisition, exact location of the pipes, and increased lengths of some of the parts of the system.

During construction of Phase I, DEQ instructed Stoneridge Utilities to increase the reliability of the controls serving both the HVR portion of the system and the SU source pumps. The estimated cost of these changes is $153,500. The Phase II work will increase the combined budgets of HVR and SU by 13%.

The Phase II work, as currently budgeted, includes repair of Well #2 and installation of automatic controls for cycling the pumps and sending alarms to the operator. The construction of the automatic controls has been completed and the exact cost is shown in the table below. The cost of completing the construction of the new well and pumping facility is itemized in the table below, as is the engineering and contingency allowance.

A comparison to the June 2004 budget is also provided.

	June 2004 Costs	October 2004 Costs
Phase I	$268,097	$275,000
Phase II		
Automatic Controls	$38,000	$46,455
Well No. 2 pump removal		$4,840
New well construction		$28,000
New 600 gpm pump		$30,000
Pump house		$10,000
Replacement of existing pump	$26,000	
Contingency	$9,600	$9,600
Engineering original	$17,600	$17,600
Engineering additional		$7,000
Total cost of Phase II	$91,200	$153,500
Total Cost for Ph. I & Ph. II	**$359,296**	**$428,500**
Life of Loan	20 years	20 years
Interest rate	2 %	2 %
Phase I Annual Payment	$16,400	$16,820
Phase II Annual Payment	$5,580	$9,390
Total Annual Payment	$21,980	$26,210

The IPUC in Order No. 29507 dated May 28, 2004, has recommended that the costs of the Phase II improvements should be born by all the users in the combined system. The cost of these improvements would be financed with an increase in the state loan that is financing the construction of the Stoneridge/Happy Valley Ranchos Water System Interconnection. This loan is by the State Revolving Fund (SRF) administered through the Idaho Department of Environmental Quality (IDEQ). The terms of the loan are 2% for 20 years. The annual repayment for this portion of the loan would be about $9,500 per year.

The updated user costs for a typical customer using 6,000 gallons of water per month are estimated below. The rates are set by the IPUC and so it is not possible to say with assurance how the IPUC will allocate the costs to the various users classes. For this estimate, it is assumed that the Phase I costs are born by the HVR customers only through a surcharge on the base rate and Phase II costs are to be born by all the customers on the combined system. Assuming that the IPUC spreads the costs out uniformly among all the customers, the increase will be the same percentage for all customers; i.e. a Stoneridge homeowner would see a $15.80 monthly charge increased to $17.81 and a commercial account would see a $5,000 monthly charge increased to $5,636.

The original rates are from the May 8, 2003 report. The revised rates reflect the October 2004 budget amounts.

	Stoneridge Utility Customers		Happy Valley Ranchos Customers	
	original rate	revised rate	original rate	revised rate
Base Charge	14.00	14.00	14.00	14.00
Phase I costs	0.00	0.00	12.65	16.33
Phase II Costs	0.00	1.78	0.00	1.78
Overage @ $0.30/1000	1.80	1.80	1.80	1.80
Phase I Costs	0.00	0.00	0.00	0.00
Phase II Costs	0.00	0.23	0.00	0.23
Total	$15.80	$17.81	$28.45	$34.14

Stoneridge would like the input of the IPUC before proceeding with taking on the additional debt to complete the proposed construction of a replacement for the original well no. 2.

Sincerely,
JAMES A. SEWELL AND ASSOCIATES
Consulting Engineers

By Joe M Olmstead
Joe M. Olmstead, P.E., Partner

c.c. John Tindall
Bill Jerrel, DEQ; 1410 North Hilton; Boise, Idaho 83706
Wayne Benner
Dean Allara