

March 10, 1998
00120100.135



Mr. Dick Goecke
Director of Public Works
City of Las Vegas
400 E. Stewart Avenue
Las Vegas, NV 89101

220
MAR 16 1998

Subject: Reclaimed Water Supply System Cost

Dear Dick:

As requested, we have reviewed the cost impact of the alternatives presented for supplying WPCF effluent to the Nevada Links and Stallion Mountain Golf Courses. We have also summarized the ability for the WPCF to expand over the next 50 years given the proposed location of the Nevada Links lease.

Summary

Two alternatives for supplying water to the Stallion Mtn./Nevada Links Golf Courses were reviewed. The smaller system transfers water at low pressure to both golf courses and has a present value, including construction, operations and maintenance, of \$984,430. The larger system, configured to also provide water at high pressure directly to the Links sprinklers, has a present value of \$2,855,065. Both alternatives cost significantly less than the anticipated present value of the reclaimed water of \$5,753,000. Therefore, either alternative will easily pay back over the life of the golf course lease.

Nevada Links has proposed a leased area that includes a strip of land along the western side of the WPCF. As indicated in the attached sketch, this would still leave sufficient space for the WPCF to build new facilities as required for the next 50 years of expansion.

Background

The WPCF will be providing effluent (reclaimed water) to both the Stallion Mountain and Nevada Links Golf Courses. Currently both courses are collectively expected to consume an average of 5 MGD with peak flows up to 7 MGD during the early "grown-in" period. These values have increased from previous estimates because of the new demand for reclaimed water to irrigate the greens. The City will be charging \$0.20 per 1000/gal for the reclaimed water.

HDR Engineering, Inc.

271 Turn Pike Drive
Folsom, CA
95630

Telephone
916 351-3800
Fax
916 351-3888

Employee Owned

Water Supply Alternatives

The following three alternatives are currently proposed.

Alternative 1 - Dual High/Low-Pressure Pumping Stations

System Description

This system consists of two pumping stations operating alternately to provide reclaimed water at different operating pressures, as well as distribution piping as necessary to convey water to the northernmost parcel of land. The low-pressure pumping station is configured to transfer water to the Stallion Mtn. Golf Course storage reservoirs at a maximum flow of 4,000 gpm (5.8 mgd) and a discharge pressure of 40 psi. It is likely, however, that this pump station would actually operate at pressures closer to 10 psi. The high-pressure pumping station is configured to supply water directly to the Nevada Links Golf Course irrigation system, also at a maximum flow of 4,000 gpm but at a higher discharge pressure of 115 psi.

The distribution piping associated with this configuration consists of two distinct systems. The low-pressure system is a 16" diameter transfer pipe from the WPCF to the corner of Stephanie St. and the Desert Inn ROW, where it empties into a pump station already being constructed by Nevada Links.

The high-pressure piping system runs north/south along the full length of the lease property with dual pipelines. The larger of the dual lines provides the bulk of the water to the fairways for irrigation. The other line is a 12" diameter pipe that provides an isolated supply of water for the golf course greens. It is interconnected with the main line at various locations so that it can be alternately charged with reclaimed water or potable water.

Backup

Under this alternative, if the pumps are taken of service for repairs or maintenance there is no backup available for the high-pressure system.

The WPCF could more easily provide a backup system for the low-pressure pumps. One candidate location for backup pumps would be the abandoned non-potable water pumping station that is also located on the plant 3-4 chlorine contact basin, opposite the proposed transfer station. Pending further study, the backup could be as simple as reactivating these abandoned pumps and tying the discharges into the irrigation line to Stallion Mtn.

Alternative 2 - Low Pressure Transfer to Links Pumping Station

System Description

This system consists of a single pumping station that transfers reclaimed water under relatively low operating pressure, as well as distribution piping as necessary to convey water to both Nevada Links and Stallion Mtn. reservoirs. The low-pressure pumping station is configured to transfer water at a maximum flow of 4,000 gpm (5.8 mgd) and a discharge pressure of 40 psi. The pump station is identical to the low-pressure unit provided Alternative 1.

The distribution piping associated with this configuration consists of a single 18" diameter transfer pipe from the WPCF to the corner of Stephanie St. and the Desert Inn ROW, where it empties into a high-pressure pump station to be constructed by Nevada Links.

Backup

The backup for this alternative would be similar to that described for the low-pressure pumps in Alternative 1.

Alternative 3 - Gravity Flow to Links Pumping Station

System Description

This system consists of a single 24" concrete pipe that conveys water to the Nevada Links pumping station by gravity only. No additional pumping equipment is necessary. The system assumes that the water level of the Nevada Links pumping station, located at Stephanie and Desert Inn, is approximately 2 feet below the elevation of the water level in the WPCF chlorine contact basins (1684.71'). The current grading plan for this area indicates a ground elevation of approximately 1700.0'. Therefore, the depth of the excavation for the pipeline would vary from 10 to 20 feet over the full length.

The cost of installation at these depths is excessive because of the size of the trench and groundwater mitigation below 10 feet. In addition, Nevada Links would still need to install transfer pumps at the Links pumping station to convey water into the Stallion Mtn. reservoirs. For these reasons, this option is not considered a viable alternative.

Analysis

The following costs presented herein are based on the following factors.

- Amortization Period - 50 years
- Interest Rate - 6 %
- Electrical Cost - \$0.05 / kWh
- O&M Labor Rate - \$65/hr
- Pump Life Expectancy - 25 years

Table 1 provides a summary of the costs associated with each alternative. It is assumed that even with regular maintenance the pump stations will require complete replacement after 25 years of service. The present value of that cost is included in the total present value below.

Table 1. Alternative Cost Summary

Item	Alternative 1 Dual High/Low Pressure	Alternative 2 Low Pressure Only
Construction Cost		
Pumping Station		
Equipment	\$336,586	\$115,910
Structural, Electrical	\$237,315	\$123,600
Mechanical	\$89,290	\$44,920
Distribution System		
Pipe/Fittings/Valves	\$760,450	\$232,000
Electrical Conduit	\$96,000	\$0
Construction Total	\$1,519,641	\$516,430
Operation/Maintenance Cost		
Electricity	\$49,760/yr	\$12,980/yr
Maintenance (Labor, Matrl.)	\$30,000/yr	\$15,000/yr
Annual O&M Total	\$79,760/yr	\$27,980/yr
O&M Present Value (50-yrs, 6%)	\$1,257,000	\$441,000
Pump Replacement (25-yrs)	\$78,424	\$27,000
Total Present Value	\$2,855,065	\$984,430

The City will be recovering the cost of the supply system by selling the reclaimed water. The annual water charge should be approximately \$365,000, which has a 50-year present value of \$5,753,079.

Future WPCF Expansion

An additional concern for the WPCF is the availability of land for future expansion. Land made available to Nevada Links would not be available for development until the end of the 50-year lease period so the WPCF should reserve space for new facilities as would be required over the entire lease period.

Currently, the next phase of expansion will be located along the eastern side of the treatment plant and is not impacted by the golf course. A similar expansion could be anticipated in 20 to 25 years. The attached sketch indicates that conceptually such a facility could be located along the northern perimeter of the treatment plant, between the golf course driving range and the plant entrance road. Beyond 40 to 50 years, facility expansion could consist of rehab, upgrading, and total replacement of facilities within the plant such as trickling filters, secondaries, etc. Further, the City also owns land to the south of Desert Inn that could be utilized if necessary.

Conclusion

The cost associated with both alternatives is well below the present value of the reclaimed water that they are designed to supply. Therefore, either system will pay back within the 50-year lease on the golf course.

With the proposed leased area, there is sufficient space remaining within the WPCF to allow for 50 years of expansion.

Please call if you have any questions or comments.

Sincerely,

A handwritten signature in black ink, appearing to read 'DAP', with a long horizontal stroke extending to the right.

David A. Pivetti
Senior Vice President

DAP:jw