Kennington Springs Pipeline Company
Level I Water System Reconnaissance Study

Prepared For:
Wyoming Water Development Commission

Executive Summary

November 17, 2003

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EXECUTIVE SUMMARY

1.0 Introduction

The Kennington Springs Pipeline Company was formed in the 1970’s and is located in the Star Valley of Lincoln County, Wyoming. The Company receives its water supply from a spring located approximately 2-miles up Sprague Creek from Bitter Creek Road in the Gannett Hills. Currently, the Company is the sole water source for 31 water shares which includes 24 active connections and approximately 90 individuals. This report was undertaken to provide a Level I Reconnaissance Study for the Kennington Springs Pipeline Company. Funding for this project was provided by the Wyoming Water Development Commission (WWDC).

2.0 Existing and Future Conditions

The Kennington Springs water system originally drew its water from two springs located along Sprague Creek. The lower spring (Spring 1) dried up several years ago leaving the upper spring (Spring 2) as the sole water source for the water system. This water system is comprised of 6-inch and 3-inch PVC transmission lines, a 7,500-gallon blending/overflow tank, and distribution piping, see Figure 1. The upper 6-inch transmission line runs approximately 1-mile from Spring 2 downstream to the blending/overflow tank. From this tank, water exceeding the demand of the system overflows into Sprague Creek. The remaining water flows approximately 1.25-miles down the lower transmission line to Bitter Creek Road where it tees into a 3-inch transmission line that runs approximately 1-mile north and 0.5-miles south. The north line reduces to a 2-inch PVC line and the south line reduces to a 2-inch steel line at unknown locations. Each of the 24 service connections branch off the 3-inch pipe line. Figure 1 shows the locations of the existing system components.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Average Star Valley Unmetered Water Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Use Condition</td>
<td>Water Usage (GPCD)</td>
</tr>
<tr>
<td>Winter Day</td>
<td>1,500</td>
</tr>
<tr>
<td>Average Day</td>
<td>1,610</td>
</tr>
<tr>
<td>Peak Day</td>
<td>2,000</td>
</tr>
<tr>
<td>Peak Hour</td>
<td>2,200</td>
</tr>
</tbody>
</table>

Currently, there are no flow meters on the Kennington Springs water system; thus, there is no way of determining the exact capacity of the spring or the demands of its users. For this report, it was assumed that the spring could produce the original
1-cfs water right. In addition, user demands were assumed to be similar to user demands of surrounding un-metered water systems (Table 1).

Since the formation of the Kennington Springs Pipeline Company, no additional water shares have been sold, preventing the system from growing. For this study, three growth conditions were addressed, no growth, moderate (1%/year) growth, and rapid (2.5%/year) growth. The 1% growth is the growth of Lincoln County over the past 20-years. The 2.5% growth is the growth experienced by the Town of Afton over the past 10-years. Both growth scenarios assume that the Pipeline Company will allow growth by selling additional shares into the Company.

3.0 Existing Facility Evaluation

The Kennington Springs water system has been a reliable water source for all of its users and has always met the demands of the system. The system originally operated off of two springs, but since Spring 1 dried up several years ago, Spring 2 has been the only water source. Spring 2 is located inside a fenced area and consists of a 6-inch perforated PVC collection pipe bedded in crushed gravel and covered with native soil. It is possible that the spring contains visqueen and clay layers as a cap for the spring. A field inspection of the spring revealed that some of the spring cover has been eroded by Sprague Creek, exposing the bedding gravel of the spring. In addition, the spring and all of the immediate area surrounding the spring have been subject to cattle grazing. A schematic of Spring 2 is shown in Figure 2.

The quality of the spring water has historically been good. Past monitoring data reveals that the spring water has been below regulatory standards for most constituents. According to historic sampling data, the water system has tested positive for the presence of Total Coliform and E. Coli. These positive tests have typically occurred in the spring during periods of run-off and snowmelt.

The transmission and distribution lines of the water system appear to be in good condition. They were installed in the 1970’s and have needed very little repair. The upper portion of this line is capable of carrying a theoretical maximum flow of 1.312-cfs while the lower line can carry a theoretical maximum of 1.105-cfs. The transmission line was buried shallow and in some areas is within 1-foot of the ground surface, creating a potential for freezing. The transmission and distribution network supplies adequate flow demand to the water users. There are two areas near the transmission line that are of concern. The first is a water impoundment located approximately half way between Spring 2 and the blending tank (Figure 1). It is unknown if the transmission line runs underneath this impoundment. The second area of concern is an active dump site located just south of the blending tank (Figure 1). Both of these sites may be potential contamination sources into the transmission line.
**NOTE**

ORIGINAL DESIGN DRAWINGS INDICATE SPRING COLLECTION AREA IS CRUSHED GRAVEL COVERED BY VISQUEEN AND CLAY FILL. IT IS SUSPECTED THAT NATIVE TOPSOIL MAY HAVE BEEN SUBSTITUTED FOR A COVER LAYER.
The blending/overflow tank is a 7,500-gallon buried, concrete tank that acts as an energy dissipation and sedimentation tank. The visible portions of the tank are showing some signs of deterioration, but otherwise, the tank appears to be in good condition.

The Kennington Springs water system is overseen and operated by a president, vice-president, board of directors, and a water sampler. These officials carry out the operation of the system, including inspection, monitoring, monetary collection, and reporting. Currently, the Water Company charges each connection $100 per year for water fees. Annual operation and maintenance is approximately $1,500-$2,000 per year.

4.0 Facility Alternatives

Three different recommended alternatives have been prepared for the Kennington Springs Water Company. These alternatives consider three different scenarios. The first is a no growth condition where the Company will not sell any additional shares in the water system. This alternative provides operation and health based recommendations and should be considered the minimum system improvements that need to be made by the Pipeline Company. Such recommended improvements under this section include watershed and spring head protection as well as various improvements to the transmission and distribution system. The following list is a summary of recommended improvements under the no growth scenario. It is estimated that costs for these improvements will be $170,500.

- Awareness and control of all activities around Spring 2 and transmission lines
- Upgrade fence around Spring 2
- Construct berms around Spring 2
- Level areas immediately around Spring 2 to prevent ponding
- Perform a source water assessment via the Wyoming Department of Environmental Quality’s SWAP program
- Perform spring site ownership research and determination
- Purchase buffer land around Spring 2
- Replace spring cap
- Perform thorough water right investigation on Company’s water rights
- Determine location of water line at irrigation pond and relocate water line (if needed)
- Dumpsite mitigation/protection
- Install flow meters upstream and downstream of blending tank
- Determine spring capacity and user demands from flow meters
- Install vacuum valve in lower transmission line
- Upgrade 2-inch distribution line segments to 3-inch PVC
- Install backflow preventors and flowmeters (optional) at each service connection
- Install a flushing hydrant on the south end of the distribution line
- Update by-laws on continuous basis

The second alternative looks at a 1%/year system growth and is considered a moderate growth scenario. Under this alternative, the water company would need to allow its system to grow according to historical county population trends. This second scenario includes the recommended improvements of Alternative 1 as well as improvements to accommodate growth. Improvements needed under this alternative include the possible construction of an additional water source if the spring is not able to meet the growing demands of the system. It is estimated that costs associated with the construction of a new well as an additional water source would be $100,000-$180,000.

The third alternative looks at a rapid growth scenario. This alternative assumes the Water Company would allow significant growth and would expand their transmission and distribution systems to accommodate such growth. For this scenario, the water company would need to provide enough water to meet the needs of its users. This would involve the development of at least one additional water source, the construction of a water storage tank and an upgrade to the size of the current transmission and distribution systems. Estimated costs associated with Alternative 3 are not provided in this study.

5.0 System Improvements Plan

The system improvements plan outlines and summarizes the recommended system improvements. A main component of this section includes a system improvement economic analysis plan where several 30 year loan options were considered. The first was a low-interest, government supplied loan and the second was a higher-interest private loan. The latter loan was the only loan that the Pipeline Company currently qualifies for due to its status as a private entity. In addition to these two loan scenarios, the possibility of 50% grant funding was considered.

Table 2 shows the estimated monthly water charges per connection for implementing Alternative 1 improvements. Table 3 shows estimated monthly costs for implementing both Alternative 1 and Alternative 2 improvements. These monthly costs are based on both loan repayment and operation and maintenance (O&M) costs. It is estimated that Alternative 1 improvements will require an estimated 208%-451% increase in the existing monthly water fee of $8.33 per connection. The extent of the increase is dependant upon the loan alternative selected. The addition of Alternative 2 will increase the existing water rate by 492%-993%.
6.0 Funding Alternatives

In order for the Kennington Springs Pipeline Company to make necessary system improvements, there are several different funding alternatives available. The Company can choose to pay for all improvements itself through private loans, or it can become a district making it eligible for low interest loans and grants. Possible grant sources available include the Wyoming Water Development Commission, the Department of Environmental Quality, the State Lands and Investment Board and the Abandoned Mine Lands, to name a few. Most of the funding programs listed above are eligible only to public entities. In order for the Pipeline Company to be recognized as a public entity, it would have to form a special district.