LEVEL I STUDY

SOUTH THERMOPOLIS WATER & SEWER DISTRICT
WATER SUPPLY PROJECT

FINAL REPORT

FUNDED BY: Wyoming Water Development Commission

MEMBERS: Floyd R. Field
George Jost
Robert E. Yemington
William Bensel
Dan S. Budd
Dick Geving
Mitchel Cottenoir, Tribal Rep.
Anne MacKinnon
William Steward
A. Lee Arrington

DIRECTOR: Michael K. Purcell, PE

ADMINISTRATOR: Jon Wade

PROJECT MANAGER: Chris Abernathy

CONSULTANT: Heath J. Overfield, PE
Engineering Associates
P.O. Box 1900
Cody, Wyoming 82414
(307) 587-4911

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# SOUTH THERMOPOLIS WATER & SEWER DISTRICT
## LEVEL I STUDY
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CHAPTER 1
INTRODUCTION

A. SCOPE OF STUDY

Engineering Associates has been retained by the Wyoming Water Development Commission to conduct the Level I Study to evaluate possible improvements to the water system serving the South Thermopolis Water & Sewer District (STWSD). Specific items to be completed under this study are to improve system operations, to identify long-term improvements needed to the water system, and to improve record-keeping practices by performing the following:

- Survey the location of each water line, service connection, curb box, sewer line, gas line, telephone line, and any other utility identified that may impact the cost of construction or repair of water system components, water tanks, vaults, valves, and municipal buildings.
- Perform a leak detection survey if determined appropriate based upon water delivery to the system versus actual amounts billed to customers.
- Utilize existing maps, descriptions, and other information on easements, annexations, and other survey-related data provided by Rick Hudson, PLS to prepare an AutoCAD map of the District.
- Incorporate survey data relating to water system components into an AutoCAD drawing.
- Generate demands for water use and prepare a water system model in WaterCAD to evaluate fire flow and system flows. Verify pipe sizes with existing District maps and information from past and present water system operators. Exploratory excavation may also be necessary to complete the inventory.
- Further evaluate operation and maintenance needs and recommend implementing appropriate changes.
- Assimilate AutoCAD surveying and mapping, water model, operational parameters, historical data, photographs, aerial photos, zoning data, land use data, easement data, and water rights data into an ArcView GIS file to provide a single source inventory of infrastructure for record keeping, planning, and analysis for the STWSD.
- Work with District personnel to identify priorities for system modifications, replacement and construction of transmission and distribution piping, and funding options.

B. BACKGROUND INFORMATION

The South Thermopolis Water & Sewer District is located in Hot Springs County, immediately south and west of Thermopolis, primarily along U.S. Highway 20. The District was formed in the 1970's and substantially enlarged in 1981. It currently covers approximately 3,537 acres.

The District has approximately 250 residents, with many of those individuals working in either Thermopolis or Worland. This population was calculated by assuming 2.3 people
per house, multiplied by the 111 current water services on the system. We feel this is a good estimate of the population. Some of the existing taps serve businesses, but there are also residences within the District that are currently not connected to the public water system.

In 2001, the per capita income in Hot Springs County was just over $29,888. It is likely that many in the District have lower incomes than the Hot Springs County average, based on discussions with local residents. Identifying viable funding and the ability of District residents to pay for any system modifications or improvements is an important component of this project.

Water for the water system is supplied by the Town of Thermopolis via a pipeline and master meter located along U.S. Highway 20, extending south from the Town’s corporate limits. South Thermopolis purchases their water from the Town of Thermopolis at a rate of $3.78 per 1000 gallons. Residents of the District generally only use water from the potable water system for domestic needs. Many residents have groundwater wells located around the District that are used for irrigation purposes, or they obtain irrigation water from the Big Horn River. The use of raw water for irrigation purposes greatly reduces the amount of potable water used within the District.

There is little data available on the STWSD water system. Several water system maps and data collected during site surveys were combined to create an electronic District map. This was completed to address operational issues discussed previously, provide mapping and modeling of the water system, and identify other modifications and/or operational changes needed by the system.

C. ABBREVIATIONS, DEFINITIONS, AND TERMINOLOGY

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>Acre</td>
</tr>
<tr>
<td>ADD</td>
<td>Average Daily Demand</td>
</tr>
<tr>
<td>BRC</td>
<td>Business Ready Community Program</td>
</tr>
<tr>
<td>CDBG</td>
<td>Community Development Block Grants</td>
</tr>
<tr>
<td>DEQ</td>
<td>Department of Environmental Quality</td>
</tr>
<tr>
<td>EA</td>
<td>Engineering Associates</td>
</tr>
<tr>
<td>EDU</td>
<td>Equivalent dwelling unit</td>
</tr>
<tr>
<td>ENR CCI</td>
<td>Engineering News Record Construction Cost Index</td>
</tr>
<tr>
<td>FPS</td>
<td>Feet per second</td>
</tr>
<tr>
<td>GPCD</td>
<td>Gallons per capita per day</td>
</tr>
<tr>
<td>GPD</td>
<td>Gallons per day</td>
</tr>
<tr>
<td>GPM</td>
<td>Gallons per minute</td>
</tr>
<tr>
<td>HDPE</td>
<td>High density polyethylene pipe</td>
</tr>
<tr>
<td>HGL</td>
<td>Hydraulic grade line</td>
</tr>
<tr>
<td>MAP</td>
<td>Midwest Assistance Program</td>
</tr>
<tr>
<td>MDD</td>
<td>Maximum Daily Demand</td>
</tr>
<tr>
<td>MG</td>
<td>Million gallons</td>
</tr>
<tr>
<td>MGD</td>
<td>Million gallons per day</td>
</tr>
<tr>
<td>NA</td>
<td>Not applicable</td>
</tr>
<tr>
<td>NESC</td>
<td>National Environmental Services Center</td>
</tr>
</tbody>
</table>
D. PROJECT NOTEBOOK

All data required to recreate the information shown in this report is included in the Project Notebook. This information includes backup data for basic modeling, pipeline parameters (diameter, length), water use demands, printouts of data for various alternatives, population information, zoning and land use information, and other backup data used to determine alternatives and recommendations. Billing and usage data provided by the District is included in the Project Notebook, as well.
CHAPTER TWO
SERVICE AREA IDENTIFICATION

A. STUDY AREA

The study area is the South Thermopolis Water & Sewer District and primarily includes developed areas along U.S. Highway 20 and Buffalo Creek Secondary (Highway 173). Projected demands are discussed in Chapter 3. There are several new residential subdivisions within the District and grant funding has been secured for a small business park in the near future.

B. EXISTING ZONING

There is currently no zoning in the District. As part of Hot Springs County, the District currently conforms to the county’s land use classifications. These classifications include Agricultural Use, Residential Use, Commercial Use, and Industrial Use. Generally, each property in the county is classified based on its actual historic use. The limits and criteria for each of these areas are described in the current Land Use Plan for Hot Springs County, dated November 18, 2002.

C. CURRENT LAND USE

Currently all four Hot Springs County land use classifications are found within the District. Approximately twenty-five percent of the land within in the District is essentially developed or un-developable. Un-developable land includes river bottom, steep hill sides and ravines, railroad, highways, and roads. Developed land includes houses, driveways, and lawns. The total area within the District is approximately 3,537 acres. Approximately 2411 acres within the District remain undeveloped. If growth occurs, it is assumed that it will occur in the U.S. Highway 20 corridor and along the Big Horn River. For our current study, this area has been assumed to grow at a rate of 2.00% per year, as discussed in the following section. Land uses in rural areas such as in the District are generally agricultural and residential.

Listed below are the current Hot Springs County Land Use Classifications and their definitions:

- **Agricultural lands:** Land actively farmed or ranched to obtain a fair rate of return. Dry land or irrigated fields, meadows, pastures, grazing land, semi-arid and arid lands, tree farming and other horticultural uses.

- **Commercial lands:** Land where commercial development is allowed, including campgrounds, hotels/motels, restaurants, retail outlets, service stations and other primarily service industries such as professional and governmental offices and developed recreational uses.

- **Industrial lands:** Lands used for industrial purposes such as mining, petroleum production and manufacturing. Industries whose sole purpose is storage,
processing and shipping of agricultural products (not to include storage, processing and shipping associated with the cycle of individual agricultural operations, i.e. ranches and farms.) Also including the storage, processing and shipping of timber products; mineral extractions, production, storage, processing, shipping or conversion to energy; fabrication, assembly, servicing, manufacture or storage of other products.

- Residential lands: Lands that contain dwelling units, including approved subdivisions, lands for which a land use change has been approved for residential use, mobile home parks, and properties on which dwelling units were constructed prior to enactment of subdivision regulations. Apartment houses, other multiple family dwellings including convents and monasteries approved for residential use or completed prior to subdivision regulations.

D. FUTURE LAND USE

Land use projections for the year 2036 were calculated using the following information:

- The residential development of land in and around the District will occur in proportion to the projected population growth (2.00% per year).
- The majority of growth within the District will occur on lands along U.S. Highway 20 and Buffalo Creek Secondary. Growth will be distributed in proportion to current land use patterns within the District, although highway business usage could increase at a slightly faster rate with the development of the business park.

Information on the existing and projected developed areas of the District is summarized in the following table.

<table>
<thead>
<tr>
<th>TABLE 2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACREAGE DATA BY LAND USE AREA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Land Use</th>
<th>2006 – Current Developed Acres</th>
<th>2036 - Additional Developed Acres</th>
<th>2036 – Total Future Developed Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway Business</td>
<td>82.46</td>
<td>66.90</td>
<td>149.36</td>
</tr>
<tr>
<td>Agriculture</td>
<td>43.39</td>
<td>35.21</td>
<td>78.60</td>
</tr>
<tr>
<td>Residential Estates</td>
<td>121.93</td>
<td>98.93</td>
<td>220.86</td>
</tr>
<tr>
<td>Totals</td>
<td><strong>247.78</strong></td>
<td><strong>201.04</strong></td>
<td><strong>448.82</strong></td>
</tr>
</tbody>
</table>

E. RECOMMENDED LAND USE AND ZONING CHANGES

The Town of Thermopolis has several surrounding features that limit its potential for growth. The steep, rocky hillsides to the north and west are not conducive to typical subdivisions. Further, similar topography, Hot Springs State Park, and the Town of East Thermopolis severely limit Thermopolis’ growth potential to the east. Consequently, the
most likely direction for development and expansion for this region is south of Thermopolis.

The existing highway and county roads, along with the District’s rural water and sewer system, make this area a prime location for new businesses and residential developments. Evidence of this development can be found in the numerous subdivisions that have been created in recent years, as well as the businesses that have either relocated to the District or are making plans to do so in the near future.

To regulate future development in the District and help maintain a healthy infrastructure, we recommend the following steps be taken:

● Adopt and implement a zoning classification system. (This system should be based, at least in part, on Thermopolis’ zoning to provide continuity.)
● Define the various land use classifications within the District, based on new zoning.
● Add procedural steps in the subdivision process to allow zoning assignments.

Suggestions for zoning regulations are included in Appendix B. A map of the District is also provided in Appendix A, showing how the new zoning would currently apply. Implementation of some sort of zoning guidelines may help control the types of development in specific areas of the District. This will minimize problems in the future with residential uses being mixed into predominately industrial or commercial areas, for instance.

F. DISTRICT BOUNDARY COMPARISON

All lands within the existing district boundary were considered when generating demands for modeling the water system. In addition, the potential for growth and possible annexations or adjacent developed lands were considered to ensure the proposed system is capable of expanding to fit future needs. The future limit of the District’s service area would be based on the future tank location, the existing ground elevations and the desire of the adjacent landowners to be included in the District. Approximate service areas for Options 1, 2, & 4 are shown on maps in Appendix A.
CHAPTER THREE
WATER DEMANDS

A. HISTORICAL DATA

Historic water usage data for treated water in the South Thermopolis Water & Sewer District for the last two years has been used to generate average daily demands and maximum daily demands. The projected average rate based on the metering records available is 151 gpd per capita, and the maximum daily demand is 377 gpd per capita. The metering records do not necessarily indicate usage on a daily basis since they are monthly records. There may have been periods where watering did not occur or the meters were not read. Also, there is currently no uniform meter-reading system in place for the District. Some meters are read monthly by the District’s operator, while others are read by the user and reported to the District. If no reading is supplied by the user for a particular month, often the District will bill the customer for the amount of water used the previous month. Any discrepancies in this approach to monthly billing are usually accounted for in subsequent meter readings.

B. PROJECTED DEMANDS

In order to evaluate future demands for the STWSD water system, it was necessary to project population. Several sources of data were analyzed, including the United States Census Bureau, the Wyoming Department of Administration and Information, and data from current land ownership. Population growth patterns across Wyoming have shifted significantly in recent years. The following population estimates were calculated using a growth factor of 2.00% per year for the District:

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual or Projected District Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>232</td>
</tr>
<tr>
<td>2005</td>
<td>242</td>
</tr>
<tr>
<td>2006</td>
<td>255</td>
</tr>
<tr>
<td>2010</td>
<td>276</td>
</tr>
<tr>
<td>2015</td>
<td>305</td>
</tr>
<tr>
<td>2020</td>
<td>337</td>
</tr>
<tr>
<td>2025</td>
<td>372</td>
</tr>
<tr>
<td>2030</td>
<td>411</td>
</tr>
<tr>
<td>2036</td>
<td>462</td>
</tr>
</tbody>
</table>

The population of the District has increased in the last few years. However, it is unlikely that the projected population will result in any significant increase in land area or water usage.
Table 3.2 shows projected domestic water usage for the STWSD over the next 30 years, based on historical demands.

### TABLE 3.2
PROJECTED DOMESTIC WATER DEMANDS

<table>
<thead>
<tr>
<th>Total Projected Water Demand</th>
<th>2006</th>
<th>2006</th>
<th>2036</th>
<th>2036</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ADD</td>
<td>PEAK</td>
<td>ADD</td>
<td>PEAK</td>
</tr>
<tr>
<td>GPM</td>
<td>27</td>
<td>108</td>
<td>49</td>
<td>196</td>
</tr>
<tr>
<td>GPCPD</td>
<td>151</td>
<td>603</td>
<td>153</td>
<td>612</td>
</tr>
</tbody>
</table>

Population projections for 2036 suggest that the population of the District will be 462 people. This would increase the average daily demand (ADD) in 2036 to 49 gpm, the maximum daily demand (MDD) to 123 gpm, and create an estimated peak demand of 196 gpm. Assuming a population of 462 in 2036 will not dramatically impact the water system, since it is currently capable of providing fire flows in excess of 1,000 gpm. Also, according to their agreement the District’s maximum allowable water usage from the Town of Thermopolis may be increased by 7.5% annually, based on the usage over the previous twelve (12) months. Using this information and the District’s actual water usage in recent years, the growth rate of allowable water usage will be sufficient to meet the projected water demand for this area.

### C. WATER DEMAND VARIATIONS

An ADD of 0.039 MGD (27 GPM) was calculated for the entire District using the total monthly water consumption records for the past 24 months. Since the STWSD does not have records for peak hour or peak day demands, peaking factors were estimated from available demand information and factors found in engineering literature. The actual calculations and assumptions are included in the Project Notebook. The design peaking factors selected are as follows:
TABLE 3.3
PEAKING FACTORS

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Day Demand</td>
<td>Average Day Demand</td>
<td>= 2.5</td>
</tr>
<tr>
<td>Peak Hour Demand</td>
<td>Average Day Demand</td>
<td>= 4</td>
</tr>
<tr>
<td>Peak Hour Demand</td>
<td>Maximum Day Demand</td>
<td>= 1.6</td>
</tr>
</tbody>
</table>

The following community water use data for small Big Horn Basin communities was transcribed from the State of Wyoming 2004 Water System Survey Report.

TABLE 3.4
DEMAND AND PEAKING FACTOR COMPARISON

<table>
<thead>
<tr>
<th>Community</th>
<th>Population</th>
<th>ADD (GPCD)</th>
<th>MDD (GPCD)</th>
<th>MDD Peaking Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Piney</td>
<td>408</td>
<td>90</td>
<td>270</td>
<td>3.00</td>
</tr>
<tr>
<td>Byron</td>
<td>600</td>
<td>100</td>
<td>316</td>
<td>3.16</td>
</tr>
<tr>
<td>Deaver</td>
<td>210</td>
<td>145</td>
<td>409</td>
<td>2.82</td>
</tr>
<tr>
<td>East Thermopolis</td>
<td>278</td>
<td>100</td>
<td>200</td>
<td>2.00</td>
</tr>
<tr>
<td>Frannie</td>
<td>209</td>
<td>75</td>
<td>144</td>
<td>1.92</td>
</tr>
<tr>
<td>Lucerne</td>
<td>100</td>
<td>200</td>
<td>350</td>
<td>1.75</td>
</tr>
<tr>
<td>Ranchester</td>
<td>718</td>
<td>232</td>
<td>709</td>
<td>3.06</td>
</tr>
<tr>
<td>Shoshoni</td>
<td>550</td>
<td>408</td>
<td>814</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>384</strong></td>
<td><strong>169</strong></td>
<td><strong>402</strong></td>
<td><strong>2.46</strong></td>
</tr>
</tbody>
</table>

A comparison of South Thermopolis' MDD peaking factor with those of communities in the preceding table indicates that the assumed peaking factor for the maximum day demand for South Thermopolis is close to the community average.

D.  FIRE FLOW REQUIREMENTS

In order to provide adequate fire protection, the recommended fire flow must be delivered to the area in need while concurrently supplying the maximum daily demand to the remainder of the system. Fire flows are limited by DEQ requirements which state that 20 psi residual pressure be maintained in the distribution system when fire flows are drawn from the system. Two or more hydrants may be needed to obtain the necessary flow in some areas of the District and for some types of development. Minimum fire flows were established based on consideration of the type and distribution of construction within the District (Type V-B with an area under 3,600 square feet).
TABLE 3.5
REQUIRED FIRE FLOWS BY LAND USE CATEGORY

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>Fire Flow (GPM)</th>
<th>Duration (Hours)</th>
<th>Minimum No. of Hydrants</th>
<th>Hydrant Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>1,000</td>
<td>2</td>
<td>1</td>
<td>500'</td>
</tr>
<tr>
<td>Commercial</td>
<td>1,500</td>
<td>2</td>
<td>1</td>
<td>500'</td>
</tr>
</tbody>
</table>

The table shown above illustrates the fire flow requirements for two common existing land use classifications in the District. Specific industrial uses may require additional fire flows. If the District changes their land use classifications and/or implements zoning, additional fire flow requirements may also apply. More discussion and data on fire flows are included in Chapter 5 of this report.
CHAPTER FOUR
EXISTING WATER SYSTEM INFORMATION

A. EXISTING SYSTEM DESCRIPTION

A map of the existing system, provided in Appendix A, shows the current configuration of the District’s water system. The Town of Thermopolis provides water to the District through a check valve and master meter. These are located on the west side of U.S. Highway 20, on the Town’s southern corporate boundary. The Town also provides water to a small number of the District’s users via a separate distribution line near Riverside Cemetery.

The District’s water transmission system is comprised of a main pipeline alongside U.S. Highway 20, and several other spur lines that radiate to the east and west of the highway corridor. The main pipeline culminates at the District’s only storage facility, a 250,000-gallon steel tank that is located at the south end of Lane 14. The above-ground tank also feeds a booster pump station that provides water to the numerous residences on Sable Run, which are considerably higher in elevation than the tank itself.

B. WATER SYSTEM EQUIPMENT AND FIXTURES

The District currently has approximately 27,300 total feet of buried water transmission line with the majority being PVC, and the remainder being ACP and DIP. The District also has 17 fire hydrants, 4 flushing hydrants, 2 manholes, 1 flow meter, 1 check valve, and approximately 34 gate valves.

1. Piping

Polyvinyl Chloride (PVC) has an impressive record of long-term durability. This pipe is invulnerable to underground external corrosion as well as internal pipe corrosion. It is able to bend or flex without breaking, making it better suited to handle ground movements. PVC pipe delivers water as clean and pure as it receives and it imparts no taste or odor to the water it transports. PVC piping in the District is the newest piping and was installed in the early 1980’s.

Asbestos Cement Pipe (ACP) has been used for many years in the underground utility industry. This pipe is strong and highly resistant to corrosion. The downside to using ACP is that it does not have the ability to flex and bend. Ground movements and maintenance work around this pipe tend to cause cracking and pipeline breaks more easily. This pipe makes up the original 4600’ of the District’s transmission pipeline along U.S. Highway 20 and is over 30 years old.

Ductile Iron Pipe (DIP) is long-lasting, and typically will have a life of 100+ years. This type of pipe has been recognized as the industry standard for modern water and wastewater systems. DIP’s high degree of dependability is primarily due to its high strength, durability, and resistance to corrosion. It is designed to resist damage during shipping and handling, water hammer, frozen ground, deep trenches, areas of high water table, and heavy traffic.
2. Fire Hydrants

Seventeen fire hydrants are currently installed in the District. Most of these hydrants were installed in the early 1980’s. (The manufacturer’s information has been collected for each of these hydrants and included in the GIS system mapping.) New hydrants should be Mueller Super Centurion 250 fire hydrants with seven foot burial depth.

3. Manholes

Two manholes in the District are located at the corporate limits to the Town of Thermopolis and contain a flow-metering device and a check valve.

4. Tank

The District storage tank is a welded steel tank, manufactured by American Steel and Iron Works, Inc. The tank was installed in 1981 and has a capacity of 250,000 gallons.

5. Booster Pump Station

The booster pump station is an underground concrete vault that contains two pumps, three pressure tanks, a system of valves and interior piping, and some electrical panels. This station was installed in the 1980’s and provides water to the residences on Sable Run.

6. Flow Meter

The master flow meter is located in a manhole on the west side of U.S. Highway 20, at the southernmost corporate boundary for the Town of Thermopolis. This meter records the total flow from Thermopolis to the District.

C. EXISTING SYSTEM EVALUATION

1. Transmission & Distribution

Overall, the system is in good working order. The water was clear and fresh at each of the flow testing locations, indicating the operator has been flushing the pipelines regularly and there is very little stagnation problem. Although the exact location of some of the service connections has not been determined, most of the working knowledge of the system has been successfully passed on from one operator to the next.

The District is currently working to replace all of the old meters in the system with newer Census models. This will improve the accessibility of the meters and reduce the time it takes to read the meters. Installing the new meters will also replace older equipment that may not be working properly, or that may be leaking. Finally, it will
help the District move toward having all of the meters in the same brand and model, minimizing the amount of spare equipment that must be stored.

2. Tank

The system operator has monitored the operation of the tank and reported that the tank may not be operating to the correct water levels. After checking the elevations of the tank and hydraulic connection with the Thermopolis system, we believe the tank is reaching the desired high water level. The location of the tank does present a problem for providing service to all of the developed areas in the District. Several spur lines have been constructed to the highest elevation possible along county roads, without exceeding the minimum system pressure requirements set forth by the Wyoming DEQ. However, in those locations there is developed property further up the roads that are currently not served.

3. Booster Pump Station

This system appears to be problematic and is not functioning as desired. Although it does provide water service to residences on Sable Run, the water pressure is minimal and many houses still require a private pressure tank.

The operator informed us that at least one of the three pressure tanks in the pump station has failed. Further, very little information is available on the existing pumps. The District does not seem to have any paperwork on this equipment, and there is no maintenance schedule. Finally, the current configuration of the pump station vault does not meet the requirements of the Wyoming DEQ or the Occupational Safety and Health Administration (OSHA).

D. WATER QUALITY

The water quality in the STWSD appears to be very good. We took samples from three locations throughout the District and the results are shown in Table 4.1. One testing site was located on the main transmission line along U.S. Highway 20. The other two were located at the farthest ends of the District, on Sable Run and on Buffalo Creek Road. We also checked for chlorine residual and found that chlorine was present in all locations. A very faint chlorine odor was also discovered during our flushing operations, indicating the water was not losing its residual or becoming stagnant in the pipelines.
TABLE 4.1
WATER QUALITY TEST RESULTS

<table>
<thead>
<tr>
<th>Location</th>
<th>Total Trihalomethane Concentration Mg/l</th>
<th>TTHM EPA Maximum Contaminant Level Limit Mg/l</th>
<th>Total Regulated Haloacetic Acids Mg/l</th>
<th>HAA5 EPA Maximum Contaminant Level Limit Mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hughes Residence</td>
<td>0.046</td>
<td>0.080</td>
<td>0.0032</td>
<td>0.060</td>
</tr>
<tr>
<td>Denton Residence</td>
<td>0.048</td>
<td>0.080</td>
<td>0.015</td>
<td>0.060</td>
</tr>
<tr>
<td>White Horse Feed Store</td>
<td>0.029</td>
<td>0.080</td>
<td>0.021</td>
<td>0.060</td>
</tr>
<tr>
<td>Average</td>
<td><strong>0.041</strong></td>
<td><strong>0.080</strong></td>
<td><strong>0.0131</strong></td>
<td><strong>0.060</strong></td>
</tr>
</tbody>
</table>

E. POTENTIAL SOURCES OF SUPPLY

1. Big Horn Regional System

The Big Horn Regional Joint Powers Board (BHRJPB) was formed in 2001 with representatives from Thermopolis, Worland, Greybull, Basin, Lucerne Water and Sewer District, Washakie Rural Improvement and Service District, and the South Big Horn Joint Powers Board. This Board has been involved with numerous studies by a variety of consultants analyzing various sources of supply as well as other water storage, treatment, and transmission improvements throughout the Big Horn Basin. Currently, the “Northern Supply Pipeline” is under design/construction, which will provide primary, supplemental, and emergency water supply from the Worland Wells to Greybull, South Big Horn Joint Powers Board, Basin, Worland, and Washakie Rural Improvement and Service District. The Northern Supply system is currently being evaluated for service to Lucerne Water and Sewer District. Expansion to the Burlington and Otto areas is also being considered.

a. In conjunction with design efforts for the Washakie Rural and Big Horn Regional projects, Engineering Associates has designed the Phase 4 Washakie Rural System so that 100 gpm, in static conditions, is available for supply to Kirby and Lucerne from the Winchester area near the Washakie/Hot Springs County line. The design of a pipeline to connect the Washakie Rural pipe system to Kirby/Lucerne is currently being considered. This option is mentioned in this report due to the potential source of water that would be “freed up” from the Town of Thermopolis water plant capacity, if Kirby and Lucerne connected to the BHRJPB and WRISD systems.

b. Information regarding the Big Horn Regional System was developed in the recent Technical Memo provided by Weston Engineering, “South Big Horn Basin Water Supply Alternatives Interim Analysis” dated July 2006.
option investigated in that memo was to replace the Thermopolis Water Treatment Plant as a water source for the Town. An estimated cost to construct a 5-million gallon per day plant was $12 million. Estimated costs per EDU (or tap) for this option was $9.36/EDU/month. It is unclear at this time if that option would represent a cost saving for Thermopolis water users.

There were two test wells drilled during the preparation of the BRS study. Below is a general summary of those findings:

The first test well was Wildhorse Butte Well, which is located 13 miles southeast of Thermopolis. Results from the test well showed the well went 900 feet deep and was located in the Madison Formation. The yield was 65 gpm and the total dissolved solids were 441 mg/l. The well was considered unsuitable due to shallow depth and inadequate yield.

The second test well was the Buffalo Creek Well #2, which is located 6.5 miles southeast of Thermopolis.

The recent Technical Memo provided by Weston Engineering, “South Big Horn Basin Water Supply Alternatives Interim Analysis” dated July 2006, states:

To test the hydrogeologic characteristics and water yielding potential, a well was drilled and completed in Buffalo Creek Monocline. The well was drilled with a 16 inch diameter borehole for the production casing to a total depth of 866 feet. After setting 866 feet of 10 ¾ inch-diameter casing with centralizers in this borehole, the casing was cemented in place with approximately 750 sacks of Class G cement. The well was then drilled an 8 ¾ inch diameter borehole to a depth of 1,068 feet.

Buffalo Creek Well No. 2 was re-entered by WESTON in early 2006 for the purpose of well development and pump testing. The well was airlifted for 72 hours to remove any remaining lost circulation materials. After the well was fully developed, a 200 HP submersible pump and motor was installed in the well to conduct a long-term pump test. After conducting a step-rate test, a 25-day long-term pump test was run at rates of 700 and 800 gpm. The test was initiated at the 700 gpm rate and at the end of the 11th day of testing the drawdown was 275 feet. The pumping rate was then increased to 800 gpm for the remaining 14 days. At the end of the test the drawdown was 350 feet. The well fully recovered to the pre-test water level in only 280 minutes, which indicated the aquifer is highly prolific and was not impacted by 25 days of pumping. The long-term testing program demonstrates that the long-term yield of the well is at least 800 gpm.

Overall, the quality of water developed from Buffalo Creek Well No. 2 is excellent, with a total dissolved solids of 440 mg/L. The water also contains iron bacteria at a concentration of 2,300 CFU/mL. A mild hydrogen sulfide odor is
present in water freshly produced from the well and is likely caused by the presence of iron bacteria that can be easily treated.

We note that the Buffalo Creek Well water has a relatively high measured hardness of 376 mg/L, mostly reflective of calcium (89 ppm). While considered high, this degree of hardness is not uncommon and does not affect the safety of drinking water. As such, EPA does not regulate water hardness. This degree of hardness may, however, increase maintenance associated with the distribution system.

The high level of total dissolved solids and hardness make use of the Buffalo Creek well water without some form of softening somewhat questionable since most residents are accustomed to water from the Thermopolis Treatment Plant that has a hardness of 100 to 120 mg/l. Many residents and businesses will likely feel the need to install domestic water softeners to minimize the drying effect on their skin and impact on dishwashers and laundry facilities.

Recently, Weston Engineering completed another Level II Study of the Southern Big Horn Regional System. Their project work included testing and redevelopment of the Buffalo Creek Well, as well as siting and possibly drilling several other test wells. HKM has also begun work to provide data and updated costs for a possible pipeline to connect Kirby/Lucerne with the Washakie Rural and Big Horn Regional Systems. In general, multiple entities are teaming up to research and develop larger regional systems with new, redundant water sources. The District should continue to monitor the progress of these efforts and review their relevance to determine the impacts various water source options will have on future costs to its consumers.

2. Schmidt Well

This well is permitted to Robert Schmidt for the purpose of stock watering. The maximum instantaneous flow of water to be developed and beneficially used is currently 25 gpm, not to exceed 4 acre-feet per year. This well was drilled and cased to a depth of 1,055 feet. The diameter of the well is 6 5/8” and the total dissolved solids level is 580 mg/L.

3. Other Existing Wells

Several property owners in and around the District were present at public meetings we held last fall that had existing wells, or knew of existing wells, that may potentially be sources of groundwater for the District in the future. There was an indication that some of the wells were currently being used as a potable water source and that the quality of the water was good. Others were permitted for stock watering, similar to the Schmidt well. The majority of the wells discussed were located outside the District boundary and would likely require testing, annexation, and possibly further development before they would be an adequate supply for the District.
CHAPTER FIVE
TREATED WATER SUPPLY MODELING AND MAPPING

A. DESIGN CRITERIA

In order to properly analyze the existing water system, establish current capacities, and evaluate future capacities and uses, design criteria needed to be established. The following design criteria are deemed appropriate for the United States according to engineering literature. These requirements were used in developing the base model for the existing system within the WaterCAD program.

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2036</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected Water Requirements</td>
<td>ADD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.039 MGD</td>
<td>0.070 MGD</td>
</tr>
<tr>
<td></td>
<td>(27 GPM)</td>
<td>(49 GPM)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.156 MGD</td>
<td>0.282 MGD</td>
</tr>
<tr>
<td></td>
<td>(108 GPM)</td>
<td>(196 GPM)</td>
</tr>
<tr>
<td></td>
<td>MDD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.097 MGD</td>
<td>0.176 MGD</td>
</tr>
<tr>
<td></td>
<td>(67.5 GPM)</td>
<td>(122 GPM)</td>
</tr>
</tbody>
</table>

Source of Supply Volumes Capacity equal to or greater than maximum day demand and redundancy as required by DEQ.

Storage Capacity Total of equalizing, fire, emergency, and bottom storage requirements.

Pressure Regulator Stations Capacity necessary to meet peak hour demand, or maximum day plus fire flow demands through the station.

Distribution Mains Sized to carry the peak hour demand at 5 fps, or maximum day plus fire flow at a maximum velocity of 10 fps and with a maximum head loss of 20 ft. per 1,000 ft.

Transmission Mains Capacity necessary to transfer maximum day demand from sources of supply to storage.

Current System Pressures

<table>
<thead>
<tr>
<th></th>
<th>Maximum 78 psi</th>
<th>Minimum-Without Fire Flow 9 psi*</th>
<th>Minimum-With Fire Flow 9 psi*</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Within the STWSD)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*We have identified one node in the existing system (J-2051) that shows a serious pressure issue. It is located immediately adjacent to the existing tank and has been taken into consideration with our proposed design alternatives.
The numbering of pipes and junctions was performed according to location. Table 5.1 shows the location, and numbering system, used in the model.

### TABLE 5.1

**PIPE AND JUNCTION NUMBERING**

<table>
<thead>
<tr>
<th>Location</th>
<th>Pipe Numbers</th>
<th>Node Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission Line from Thermopolis, along U.S. Highway 20</td>
<td>1013 - 1045</td>
<td>1009 – 1045</td>
</tr>
<tr>
<td>Distribution Line from U.S. Hwy 20, along Buffalo Creek Secondary</td>
<td>2002 – 2045</td>
<td>2021 - 2049</td>
</tr>
<tr>
<td>Lane 3</td>
<td>2001</td>
<td>2000</td>
</tr>
<tr>
<td>Lane 5</td>
<td>2003</td>
<td>2001</td>
</tr>
<tr>
<td>Bobcat Drive</td>
<td>2021</td>
<td>2017</td>
</tr>
<tr>
<td>Lane 14</td>
<td>1000 – 1011</td>
<td>1000 – 1009</td>
</tr>
<tr>
<td>East Spur at Tank Site</td>
<td>2053</td>
<td>2051 - 2053</td>
</tr>
<tr>
<td>Sable Run</td>
<td>2055 – 2067</td>
<td>2069 – 2075</td>
</tr>
</tbody>
</table>

Demands within the District were distributed according to the land use classifications of the area surrounding each junction, with an adjustment for high water usages of known origin. Information on the existing water system is shown on the modeling maps in Appendix A.

### B. HYDRAULIC MODEL - WATERCAD

The base model for this study was developed from records provided by the District and information from Charlie Stickney, System Operator. Ruben Vialpando, the former operator, and other resources were also used to provide additional information. Various data are required in order to properly iterate the model. These data include pipe diameter, length, elevation, roughness coefficient, and demands, along with storage tank elevations. Roughness coefficients were based on the Hazen-Williams "C" Value which is assigned according to a pipe’s material and estimated age. Piping in the District’s system is almost entirely PVC, but the original pipeline from Thermopolis to the fire hydrant near the District’s sewer pump station is constructed of AC pipe (approximately 5,000 lineal feet). There is also a possibility that other materials were used for connections and service lines.
Table 5.2 shows the roughness coefficients which were used.

<table>
<thead>
<tr>
<th>Type of Pipe</th>
<th>Pipe Age</th>
<th>&quot;C&quot; Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC</td>
<td>0 - 30   Years</td>
<td>120</td>
</tr>
<tr>
<td>ACP</td>
<td>0 - 20+  Years</td>
<td>120</td>
</tr>
<tr>
<td>HDPE</td>
<td>New</td>
<td>140</td>
</tr>
</tbody>
</table>

Engineering Associates has a portable recorder that allows recording of system pressures at selected locations over an extended period of time. Collecting pressure readings on various parts of the system provides a good understanding of the actual performance of the existing system. This is paramount to the calibration of the model to ensure that the model is representative of the operation of the actual system.

The model was calibrated using the following procedure:

1. The pressure recorder was attached to a fire hydrant and left in place for 24-48 hours. This was repeated at numerous locations throughout the system to determine pressure fluctuations under normal system operation.

2. A flow meter was connected to the 4.5" diameter pumper nozzle on a fire hydrant (flowing hydrant). In some instances, the pressure was checked at the flowing hydrant and at a second hydrant nearby to check for continuity with previous pressure recordings.

3. The flowing hydrant was fully opened and the rate of flow was recorded. This procedure was repeated at multiple locations in the system to estimate available fire flows. However, in most locations the flows rates were too small for an accurate reading.

After the model was calibrated, other conditions were analyzed by making changes to the parameters – i.e., fire flows. Demands were added using water user records obtained from the District for residences and businesses.

Fire flow and tank sizing requirements were based on the 2003 Edition of the International Fire Code, which was recently adopted by Wyoming State Statute 35-9-106, as well as NFPA, ISO, AWWA, and other recognized literature establishing criteria for fire prevention.

Demands within the District were also adjusted according to the land use classifications of the area surrounding each node. If a known high water user is within an area, an increase adjustment was added to the node. Spreadsheets showing the distribution of demands within the system are included in the project notebook.
The calibration of the model was completed using the pressure recorder results. Pressures within the STWSD were measured at six different locations using a continuous pressure recorder. The model was run at the average daily demand to compare the model with the field data. The pressures from the model were very similar to the field data, with an average pressure in the District of 8 to 80 psi. Table 5.3 shows the results of the pressure tests.

**TABLE 5.3**

**SUMMARY OF MODEL CALIBRATION RESULTS**

<table>
<thead>
<tr>
<th>Pressure Recorder Location</th>
<th>Junction</th>
<th>Field Data</th>
<th>Model Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sable Run – 3rd Hydrant</td>
<td>J-2055</td>
<td>45 - 75 psi</td>
<td>41 psi</td>
</tr>
<tr>
<td>Sable Run – 1st Hydrant</td>
<td>J-2069</td>
<td>70 – 100 psi</td>
<td>73 psi</td>
</tr>
<tr>
<td>Buffalo Creek Road – Intersection w/ U.S. Hwy 20</td>
<td>J-2021</td>
<td>53 psi</td>
<td>53 psi</td>
</tr>
<tr>
<td>Buffalo Creek Road – Hydrant No. 376</td>
<td>J-2039</td>
<td>60 psi</td>
<td>57 psi</td>
</tr>
<tr>
<td>Buffalo Creek Road – Hydrant No. 380</td>
<td>J-2049</td>
<td>75 psi</td>
<td>74 psi</td>
</tr>
<tr>
<td>Bobcat Drive</td>
<td>J-2017</td>
<td>44 psi</td>
<td>44 psi</td>
</tr>
</tbody>
</table>

It should be noted that the pressure tests at the two hydrant locations on Sable Run recorded a wide range of pressures over each 2-3 day test. This variation is attributed to the existing booster pump station that supplies water to this area. As seen in the results, water use and the operation of the booster pump keep this section of the system in a constant state of fluctuating pressures.

Current literature recommends that the difference between the static and the flowing pressure readings at the residual hydrants be at least 5 psi. The differences obtained during the test on the District water system ranged between 0 and 3 psi. The flow test was conducted in the early morning hours when other demands on the system would be at a minimum. These results indicate that the model is well calibrated for the purposes of this study.

The existing distribution system is shown in Appendix A. This map shows pressure contours for the system under average day demand and location of system pressure nodes.

Proposed system improvements are also shown in Appendix A. These drawings show proposed improvements, including new transmission mains and storage tanks, fire flow improvements, and pipe replacements recommended by this study.
C. FIRE FLOW CAPACITIES

Municipalities are required to provide adequate fire flow to their community per the State Fire Marshall and 2003 International Fire Code (IFC). The requirements state that a certain flow and time duration is required with a minimum delivery pressure of 20 psi, while not allowing pressures at other locations to go below 20 psi. This is also required by Wyoming DEQ.

Based on this criterion, we analyzed fire flow capacities in selected business and residential areas. In general, the District system pressure is least along the west side of District and greatest in the southeast corner of District. The fire flow demand for residential areas is 1,000 gpm for 2 hours, and 1,500 gpm for 2 hours is required for businesses.

D. STORAGE CONSIDERATIONS

1. Types of Storage

There are four general types of storage considered when calculating storage requirements. Those include: supply, fire, reserve, and bottom. Supply storage, also known as equalization storage, is the difference between the supply rate and the MDD. Fire storage capacity refers to the water required to meet fire flow requirements for the designated duration. Reserve storage capacity refers to the volume of water to be held in the reservoir for emergencies. Bottom storage is the volume of water lost due to the silt traps used in tank bottoms to keep the tank from being drained completely and sucking silt back into the system.

2. Supply Storage

The demand for water in a distribution system varies during the day. Minimal usage is experienced from 9 pm until 6 am, while a constant, higher rate is anticipated between 6 am and 9 pm. Supply, or equalizing, storage provides water to the system during those periods when the demand rate exceeds the supply rate. Maximum day demand is used to calculate the storage volume needed to augment the supply available during this worst-case scenario. This volume needed is found by plotting the demand curve against the supply curve, over time. From this mass diagram, the sum of the vertical distances between the two curves yields the amount of supply storage necessary to meet the demands of the system for the maximum day conditions.

A normal distribution of percentage of MDD expected for each hour of the day is used to develop the demand curve. The supply curve represents the expected flow that is delivered to the District by Thermopolis and the storage tank. Although the demand curve for use on Sable Run may create some anomalies in the supply rate to the District, that factor is considered insignificant for this analysis because those users do not rely on tank storage. Therefore, a constant supply curve is used for this evaluation. Since the supply from Thermopolis is over 300 gpm and the MDD is
67.5 gpm, there is no difference between the two curves and the District needs no supply storage.

3. Fire Storage

The maximum required fire flow within the District in 2036 is estimated at 1500 GPM, or 180,000 gallons over two hours. Thermopolis can provide approximately 300 gpm or 36,000 gallons over two hours to supplement the District's fire flows. Thus, the District should provide 144,000 gallons of fire storage to conform to 2003 International Fire Code (IFC) recommendations. The District currently has 250,000 gallons of storage, which is adequate fire storage to comply with IFC.

4. Reserve Storage

Reserve storage is provided to enable the system to meet minimal demands on the system in the event of a facility outage. For this report, we have used an estimate of 40 gpcd for 2 days as the basis for meeting emergency needs. This assumes that the District will conserve water, resulting in a 60% reduction from the normal usage rate of 151 gpcd for the period required for repair of the facility. Reserve storage is calculated at approximately 31,100 gallons.

5. Bottom Storage

Aside from all other storage requirements, there should always be at least 0.75 foot of storage in the bottom of the storage tanks. Bottom storage is calculated at 10,700 gallons.

E. SYSTEM ANALYSIS

Some questions posed by the District concerning their water system are listed below:

- Can adequate fire flows be provided to serve the existing business corridor along U.S. Highway 20?

- Can adequate fire flows be provided for the proposed business park at the intersection of U.S. Highway 20 and Buffalo Creek Secondary?

In order to answer these questions, several conditions were modeled. The Project Notebook contains a detailed printout with the results of each case. The model results indicate that portions of the existing system are not capable of producing recommended fire flows of 1500 gpm. The existing water system can generate fire flows of 750 gpm on the west side of the District and 1,200 gpm on the east side. While this does not always meet the recommended flow rate of 1,000 gpm, these flow rates should provide adequate fire protection for the District in the near future due to the sparse nature of development within the District. The District should start installing upgrades to the system, including the transmission lines identified and additional storage at higher elevations, over the next decade to insure adequate flows are available for growth. Table 5.4 is a summary of conditions modeled.
# TABLE 5.4
**SUMMARY OF CONDITIONS MODELED**

<table>
<thead>
<tr>
<th>NODE AND FIRE FLOW</th>
<th>Existing System</th>
<th>Option 1 (Tank only)</th>
<th>Option 1 (Pumps on)</th>
<th>Option 2 (Tank only)</th>
<th>Option 2 (Pumps on)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junction Node</td>
<td>Fire Flow</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J-1027</td>
<td>1000 gpm</td>
<td>0 gpm</td>
<td>n.a.</td>
<td>784 gpm</td>
<td>20 psi</td>
</tr>
<tr>
<td>J-2001</td>
<td>1000 gpm</td>
<td>0 gpm</td>
<td>n.a.</td>
<td>1001 gpm</td>
<td>24 psi</td>
</tr>
<tr>
<td>J-2021</td>
<td>1000 gpm</td>
<td>0 gpm</td>
<td>n.a.</td>
<td>629 gpm</td>
<td>20 psi</td>
</tr>
<tr>
<td>J-2053</td>
<td>1000 gpm</td>
<td>0 gpm</td>
<td>n.a.</td>
<td>627 gpm</td>
<td>20 psi</td>
</tr>
</tbody>
</table>

Notes:
1. System pressure is the limiting pressure found in the system under the specified scenario.
2. Fire Flows are a problem with this "quasi-rural" system due to extreme distance and elevation differential.
F. GEOGRAPHIC INFORMATION SYSTEM MAPPING

A Geographical Information System (GIS) was created and includes a geodatabase with many different feature classes that can be represented by different layers in the GIS. The 2002 South Thermopolis orthophoto and USGS topographic map serves as a base layer over which all other layers can be overlaid.

The parcel ownership information for Hot Springs County is included in the GIS. Unfortunately, the parcel ownership layer has some spatial alignment problems which the County is aware of but has been unable to resolve. The alignment is still close enough to be useable, so it is included in the GIS to provide ownership information.

Geodatabase feature classes for treated water lines, valves, fire hydrants and other appurtenances were created. Additional geodatabase fields for the treated water lines store the pipe size, material, pressure rating, size, and type. Similar information on valves and fire hydrants can be added in the future as the information becomes available.

The GIS was used to determine the developed, undeveloped, and rights-of-way areas (un-developable areas) in each type of zoning. This information was used in projecting future demands on the water system.

The State Plane Coordinate System, Wyoming West Central Zone, using the North American Datum of 1927, was used for this GIS. This coordinate system was chosen because most of the existing survey data was referenced to this coordinate system. Engineering Associates used the same surveying control network used by Rick Hudson so our survey data would align with his survey data in the GIS. The GIS was created using Arc View 9.1. Much of the spatial information in the geodatabase was created by importing AutoCAD data, which was created based upon survey data provided by Rick Hudson, PLS and Engineering Associates. A topographic contour with twenty-foot intervals was generated with the survey data obtained throughout the District. This can be overlaid on the USGS topographic map, which has only twenty-foot intervals.

The GIS is very useful for creating maps that graphically display multiple pieces of information together, enabling the user to see how they are related. It is also useful as a database to store information about the District’s assets and their location. Once the GIS contains basic information, it can be useful in quickly answering questions regarding the system and its components. For example, if several residents called with a water outage complaint, the GIS could be used to identify which waterline is the problem. The size of the line could be determined so the repair people could make sure they have the right size with them to repair the break. In addition, the location of the valves necessary to shut down the water to the broken line could also be determined. Finally, a map and table could be printed for the repair people with this information.
The numerous water system maps, land use maps, and right-of-way and easement maps with orthophoto background included in other areas of this report were created from the GIS mapping of the District. Information relating to the water system has been integrated into the database.
CHAPTER SIX
ALTERNATE DESIGNS AND COST ESTIMATES

A. ALTERNATIVES CONSIDERED

Extensive consideration was given to options that would help the District improve system pressures, streamline system operations, and supply water to more of the property currently included in the District, without significantly increasing user costs, compromising public safety, or substantially increasing the complexity of the system. Some of the options we identified as possible solutions were later ruled out after additional research showed they were not feasible, or the cost/benefit ratio was not acceptable.

A few of the options we considered and eliminated include:

- Move the existing tank to a location on Sable Run, approximately 4500 lineal feet to the southwest of the current location – This was ruled out after modeling showed that the elevation gained was not substantial enough to be cost effective.

- Replace the existing booster pump station – Wyoming DEQ regulations would have required an entirely new facility, instead of just replacing the equipment. Further, it is extremely unlikely that this alternative would qualify for WWDC funding, due to the nature of the project. Finally, replacing this pump station would only be a temporary solution to many of the problems in this part of the system. This was ruled out after weighing the cost of the new station against the amount of users it would affect and the long-term benefit to the District.

- Loop several of the dead-end waterlines in the county roads along U.S. Highway 20 – This alternative would have eliminated most of the potential for stagnation of the water in these pipelines, while also providing better flows in these areas and reducing the District’s costs associated with its flushing efforts. However, this option was ruled out after comparing the costs of the new piping with the existing costs of increased flushing efforts. Further, not all of the looping pipelines would have been viable without moving the storage tank, as some of them would have extended outside of the existing minimum pressure zone.

After looking at the various options and evaluating the District’s needs, the following were selected for further consideration:

- Option 1 – Upper Schmidt Tank & Buffalo Creek Road Loop
- Option 2 – Coyote Run Tank & Buffalo Creek Road Loop
- Option 3 – Buffalo Creek Road Loop
- Option 4 – Tank at Lane 7 and Lane 12
B. OPTION 1 - UPPER SCHMIDT TANK & BUFFALO CREEK ROAD LOOP

This alternative was created after diligently researching numerous individual solutions to the District’s most pressing issues and determining that several of them were not feasible as stand-alone options. The key components of this option include a new storage tank location, a pump station, two PRVs, and several miles of new water transmission lines. The existing tank could be reused, since it is still in good condition.

The most important aspects of this alternative include the new tank location and the pump station. A map in Appendix A illustrates the substantial increase to the District’s serviceable area that can be achieved with this option. This location will also correct the pressure problems we identified near the existing tank when we modeled the system. New transmission lines along Lane 12 and Sable Run will provide the potential for development in the District, while also eliminating the existing booster pump station and greatly improving water pressure in that area.

Two parts of this alternative could be completed separately, but they would be dependant on the new tank location and pump station. These include the looping pipelines for the existing county roads along the west side of U.S. Highway 20, and providing service to the east side of the Big Horn River. The increase in tank elevation would provide the additional pressure necessary for these pipelines. Although the Buffalo Creek Loop lies outside the current District boundary, many people have expressed an interest in getting water service in this area. The District recently received a petition from landowners in the area, asking that the District consider providing service to them.

C. OPTION 2 – COYOTE RUN TANK & BUFFALO CREEK ROAD LOOP

This alternative incorporates many aspects of Option 1, while increasing the serviceable area to include current District members located on Coyote Run. While most of the components are the same, an additional (second) pump station will be required to reach this tank location. Three pressure zones would be created across the system. A map that illustrates the minimum pressure zone provided by this tank is shown in Appendix A.

Current residents on Coyote Run have filed a petition with the District Board, requesting water service. Because their property is included within the District boundary, they pay a mill levy equal to all other District members. However, they currently receive no services from the District. Most of these residents must haul water because potable groundwater is not available. This option would provide water service to this area, as well as alleviate most of the problems we identified with the current system and addressed with Option 1.
D. OPTION 3 – BUFFALO CREEK ROAD LOOP

The eastern boundary of the District is currently located along the Big Horn River. County residents on the east side of the river, who are currently located outside of this boundary, have expressed an interest in becoming part of the District and receiving water service. This option will not provide the necessary water pressure for all of the residents that have shown interest, without the relocation of the existing tank. We identified this specific portion of Options 1 & 2 as a separate item in order to assist the District in determining the feasibility of supplying water service to this area. If the prospective users would like to proceed with this option prior to relocating the tank, a separate pump station would have to be added to provide adequate water pressure. The cost of this pump station is not identified in this study, but would be similar to the costs provided in other options.

E. OPTION 4 – TANK AT LANE 7 AND LANE 12

This alternative was created by changing Option 1 and placing a storage tank near Lane 7 and Lane 12 instead of in the Upper Schmidt area. This tank has the same elevation as the Upper Schmidt tank but with less transmission lines. The key components of this option include a new storage tank location, a pump station, two PRVs, and several miles of new water transmission lines. The existing tank could be reused, since it is still in good condition.

The most important aspects of this alternative include the new tank location and the pump station. A map in Appendix A illustrates the substantial increase to the District’s serviceable area that can be achieved with this option. This location will also correct the pressure problems we identified near the existing tank when we modeled the system.

Two parts of this alternative could be completed separately, but they would be dependant on the new tank location and pump station. These include the looping pipelines for the existing county roads along the west side of U.S. Highway 20, and providing service to the east side of the Big Horn River. The increase in tank elevation would provide the additional pressure necessary for these pipelines. Although the Buffalo Creek Loop lies outside the current District boundary, many people have expressed an interest in getting water service in this area. The District recently received a petition from landowners in the area, asking that the District consider providing service to them.

F. RECOMMENDED IMPROVEMENTS

Considering all the factors impacting the District’s Water System, the option that we recommend implementing is Option 1. This option will provide the most cost-effective
improvements to the water system, and will address most of the problems we identified in the existing system. Much of the work under this option is eligible for WWDC funding. Unfortunately, the legislative changes to the OSLIB program have greatly reduced the amount of grant funding available by distributing the funds directly to counties and municipalities. This increases the financial burden on the District citizens for these improvements, since more loan funds and matching funds will be needed. We believe Option 1 will provide the greatest benefit to the most citizens in the District, for the least cost.

G. POTENTIAL FUNDING SOURCES

There are numerous available funding sources for water related improvements, both at the State and Federal levels. Different funding sources have different program requirements, as well as various types of funding. Most typical are grant funds, which usually require some percentage of matching funds. Loans are also available at various terms and interest rates.

Typically, State funded projects are “approved” prior to the legislative session, but are only formally funded once the legislature approves the related budget. These funds are usually unavailable until June of each year, even though funding applications are often due up to 9 months prior to that date. Below is a summary of some of the programs available.

1. Wyoming Water Development Commission (WWDC)

This program provides loans and grants for construction projects that promote the optimal development of the state’s human, industrial, mineral, agricultural, water and recreational resources. Construction Phase funding from the WWDC is known as “Level III” funding. This funding is limited to eligible projects that meet the criteria for water supply, storage, and/or transmission. Drinking water projects identified for Level III funding are funded from one of two different accounts. One account is for New Development, while the second account funds Rehabilitation projects. The Rehabilitation program funds projects for water systems that have been in use for at least 15 years. Currently, grants are generally awarded at 67% of the project costs, with a 33% match or loan coming from other sources. Both New Development and Rehabilitation project loan funding is 4% for municipalities, with the term to be set by WWDC ranging from 20 to 50 years. WWDC will not sign legal documents/agreements to begin a project until the sponsor can demonstrate that they have acquired 100% of the matching funds.

2. DEQ State Revolving Fund Loan Program (SRF)

The SRF Loan Program funds projects for all types of water system issues, including supply, storage, distribution, transmission, and treatment. There are two sections to
this loan program, the “Clean Water State Revolving Fund (CWSRF)” and the “Drinking Water State Revolving Fund (DWSRF)”. The CWSRF generally targets storm water and wastewater treatment projects. The DWSRF provides loans for water systems requiring improvements. The ranking criteria for the DWSRF includes Public Health Issues (200 pts), Compliance Issues (240 pts), System Deficiencies that may affect public health or compliance (85 pts), and Affordability (30 pts).

Project Affordability –

Relative Income Index = 77.1% (4 pts)
South Thermopolis Annual Median Household Income (AMHI) = $29,205
Wyoming Annual Median Household Income (AMHI) = $37,892

Relative Water Rate Index = 3.1%* (15 pts – highest rank)
Expected Average Annual Residential User Charge * = $901.80
Local AMHI = $29,205

* The figure above represents the estimated residential use at the current rate schedule assuming a use of 3,000 gallons per month. Any rate increases as a result of the Town of Thermopolis or the South Thermopolis Water & Sewer District’s project requesting funding can be included in this charge.

SRF loans have up to a 20-year term and an interest rate that is currently 2.5%. The first payment on a loan made through this agency is due one-year after project completion. These loans can be used as matching funds for WWDC, OSLIB, and AML grants. An environmental review is required before a loan will be provided by this agency. Minority-and-women-owned business enterprises must be given an opportunity to bid on materials and labor not provided by the owner.

3. Office of State Lands and Investment Board (OSLIB)

This program is currently in a state of flux, as funds have been split amongst all counties in the State. Each county commission is charged with dispersing those funds individually. Criteria for dispensing the funds are being developed. It is difficult to predict the final outcome of this process at this time. Further changes in this process are anticipated in the near future. Due to the current situation, OSLIB funding should not be considered as a viable source at this time. The following information describes the operation of OSLIB prior to the conclusion of the 2007 Legislative Session.

OSLIB provides grants and loans from the Mineral Royalty Account during two meetings each year. This funding is available for water, sewer, storm drainage, road, solid waste, emergency vehicles, and public buildings and health care
facilities. Since almost every type of public project can be funded by these monies, there is often a lot of competition for funding. Funds available each year are variable, but total funding available is approximately $11 million per semi-annual meeting. Amounts vary annually based on distributions from the legislature. Typically, grants are available at the 50% level if at least 7 mils have been levied by the municipality. Over 50% can be granted if the municipality has levied at least 11 mils during the previous tax year.

In addition, up to 75% matching grants are available for public infrastructure projects in districts with populations under 1,300 people or in Counties where the 3 year average of local government sales and use taxes is under 70% of the statewide average. South Thermopolis Water & Sewer District and Hot Springs County meet these requirements. On an annual basis, 12.5% of the total money available is earmarked for these communities.

Mitigation of health and safety issues qualifies a grant request in the highest priority category, as well as projects that have already received some type of funding (ongoing projects). Currently, loans are also available at 6% interest for a term of 30 years.

4. Community Development Block Grants (CDBG)

The CDBG Program has been established for economic and community development projects. The Wyoming Community Development Authority manages the portion of funding designated by the Wyoming Business Council for housing in Wyoming.

The CDBG Program is a federal funded pass-through grant program from the U.S. Department of Housing and Urban Development (HUD). Wyoming has received an annual allocation from a low of $2.2 million, to a high of $3.7 million. In order to qualify for funding, the project must meet one of three HUD imposed national objectives.

The three objectives are:

- Benefit to low and moderate income families;
- Elimination of slums and blight;
- Projects which meet an urgent community development need that pose a serious and immediate threat to the health or welfare of the community.

Moderate income is defined as eighty percent of the median income and adjusted by family size. In addition, if permanent jobs are not created as a direct result of the project, there are other various income criteria that must be met.
Because of the limited amount of funding available, this may not be a program that is well-suited for water project funding.

5. Wyoming Business Ready Community Program (BRC)

The Wyoming Business Council was created in 2003 to promote economic development at local levels. Grant and loan funding is available under three different categories.

- **Community Readiness** – Infrastructure construction for future businesses or new business development (i.e. industrial park). Must demonstrate potential for new job creation.
- **Business Committed** – Must be backed by a specific business(es) that requires infrastructure improvements. Requires proof of the potential to create jobs.
- **Community Enhancements** – Aesthetic improvements (N/A for this study). This relatively new funding source is a great source for businesses in the community to utilize for new infrastructure construction in locations at the edges of municipalities where infrastructure may not currently exist. Municipalities hoping to create economic development via a business park can now provide infrastructure for those needs with this grant funding.

Grants are available up to $1,500,000, and a match of either 5% or 10% are dependant upon the amount of the grant. No or low-interest loans up to $1,500,000 are also available at the Board’s determination. This loan money cannot be used to refinance or pay off existing loans.

6. Rural Utility Services (RUS) Funding from USDA

This USDA program provides funding for mainly water- and sewer-related projects in rural communities. RUS and the WWDC work closely on water projects to try to provide the most affordable options for Wyoming communities. Historically, WWDC has provided a grant for 50% of eligible costs, which is matched by a grant and loan from RUS. RUS has also established a minimum water bill for Wyoming communities to be approximately $30 to $40 per month in order to qualify for funding. Currently, the base rate for residential water service in the District is $23.00 per month. However, it should be noted that the average residential water bill in the District is over $38.50 per month.

RUS considers several factors to determine grant eligibility and loan interest rate. Statewide and local MHI's are derived from census data collected by the Census Bureau (currently using 2000 census data). A comparison of the Median Household Income (MHI) to the State MHI is used to determine eligibility and
ranking. If the MHI in the project area falls between 80% and 100%, it is considered to be “Intermediate Level”. Typically, debt service for the water system at this level must exceed 1% of the MHI. If the MHI in the project area falls below 80%, it is considered to be “Poverty Level”. In this level, debt service should exceed 0.5% of the MHI.

The District currently has $44,650 in debt load. There are 127 EDUs counting the 4-5 large taps in the District. The MHI for South Thermopolis is assumed as the same as Thermopolis which is $29,205, while the State MHI is $37,892. The District’s ratio of MHI is 77.1%. This ratio qualifies STWSD for USDA poverty level funding. Dependent upon the availability of funds, the program provides grant funding once debt service exceeds 0.5% of MHI per EDU ($146.03 per EDU per year).

Discussions with RUS indicate that based on 2006 funding available, the best case scenario for projects is 80% loan and 20% grant. South Thermopolis is eligible for the “poverty interest rate”, which is higher than the SRF loans available.

Grants are usually higher for Poverty Level projects. However, in discussions with Alana Cannon at RUS, they are anticipating a much larger portion of loan funds than grant funds in the next fiscal year. For projects serving areas with MHI of over 100%, the loan interest rate is set at market rate (currently 4.125%). Interest rates for USDA loans are set at halfway between market rate and the poverty level interest rate for intermediate income level areas, currently 4.25%. The loan rate for poverty level income areas is set at a rate of no greater than 4.5%. Thus all three income ranges would receive the lowest interest rate of 4.125%. The term on USDA loans is generally 30 years in Wyoming. The USDA currently requires that their grants be matched with USDA loan funds.

7. Other Funding Sources

There are also several entities that provide technical assistance, especially targeted at small water systems. At a national level, any district with a population under 10,000 is considered a small water system. Unfortunately, almost every community in Wyoming qualifies as such so project funding based on population is not very effective. These agencies include:

- Wyoming Rural Water Association (WRWA) – training and on-site assistance;
- Rural Community Assistance Program (RCAP) – Wyoming is part of “MAP”, or the Midwest Assistance Program – training and technical assistance;
- National Environmental Services Center (NESC) – training;
Another funding source is the Optional 1-Percent Sales Tax-Special Purpose County Tax (Capital Facilities Tax). Hot Springs County has been utilizing the 1% General Purpose Tax since 1977. This additional tax is used exclusively for a specific project or activity. Once the funds needed to fund that project or activity are collected, the tax is discontinued. The General Purpose and Special Purpose taxes can be imposed separately or together. The taxes also do not have to be 1%, but could be 0.25% or a higher portion of a percent. This tax must be approved County-wide by a vote. Table 6.1 is a summary of various funding options available and associated requirements.
# TABLE 6.1
## SUMMARY OF VARIOUS FUNDING SOURCE OPTIONS

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Type of Projects</th>
<th>Grant</th>
<th>Required Match for Grant</th>
<th>Loan</th>
<th>Environmental Review Required?</th>
<th>Application Due Date</th>
<th>Other Information Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWDC</td>
<td>Storage, treatment, transmission, raw water</td>
<td>67% typical</td>
<td>33% (Loan is not Required)</td>
<td>33% of project costs 20-50 years 4% interest</td>
<td>No</td>
<td>Aug. 15 for new; Oct. 1 for ongoing</td>
<td></td>
</tr>
<tr>
<td>DWSRF</td>
<td>All water projects</td>
<td>None</td>
<td>N/A</td>
<td>100% of project costs Up to 20 years 2.5% interest</td>
<td>Yes</td>
<td>Loans only – every other month at SLIB meetings</td>
<td></td>
</tr>
<tr>
<td>SLIB</td>
<td>Public projects</td>
<td>50% to 75%</td>
<td>25% to 50%</td>
<td>25-50% of project costs 30 years 6.0% interest</td>
<td>No</td>
<td>3rd Thursday in February for June meeting; 3rd Thursday in September for January meeting</td>
<td>This process has changed as of March 2007.</td>
</tr>
<tr>
<td>CDBG</td>
<td>Community and economic development</td>
<td>Up to $300,000</td>
<td>Varies</td>
<td>N/A</td>
<td>Yes</td>
<td>1st of August, October, February, or May</td>
<td>Must meet HUD guidelines. Public hearing is required.</td>
</tr>
<tr>
<td>BRC – Business Committed</td>
<td>Specific business must require infrastructure improvements</td>
<td>Up to $250,000</td>
<td>5% match</td>
<td>$1,500,000 max. No or low interest as determined by Board.</td>
<td>No</td>
<td>July 10, 2007</td>
<td>Public hearing is required. Various business related items required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$250,000 to $1,500,000</td>
<td>10% match</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRC – Community Readiness</td>
<td>Proposed business or industrial park infrastructure needs</td>
<td>Up to $250,000</td>
<td>5% match</td>
<td>$1,500,000 max. No or low interest as determined by Board.</td>
<td>No</td>
<td>(Current dates unavailable)</td>
<td>Public hearing is required. Comprehensive Economic Development Strategy (CEDS) and other employment related items required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$250,000 to $1,500,000</td>
<td>10% match</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RUS</td>
<td>Water and sewer</td>
<td>20%</td>
<td>80% from other sources</td>
<td>80% 30 years 4.5% interest</td>
<td>Yes</td>
<td>Typically pursued in conjunction with other funding</td>
<td>Preliminary Engineering Report (PER) Required.</td>
</tr>
</tbody>
</table>
H. AFFORDABLE USER FEES

Affordability is a function of the household ability-to-pay. According to the Environmental Protection Agency (EPA) guidance document “Information for States on Developing Affordability Criteria for Drinking Water,” household ability-to-pay is based on several factors. Factors include median household income (MHI), unemployment rates, rate structures, cost of living, and taxes. Areas with low MHI, high unemployment, high cost of living, and high taxes have populations with a low household ability-to-pay. Conversely, areas with high MHI, low unemployment, low cost of living, and low taxes have a population with a high ability-to-pay.

Several of the factors influencing ability-to-pay are codependent and can be considered aggregately. Cost of living, taxes, and unemployment within a state generally vary less than nationally. Thus, comparison of the statewide MHI with the project area MHI is one way to begin establishing user ability-to-pay. This is the method established by RUS to determine eligibility for their grant program. It is also used during the scoring process for SRF loans. South Thermopolis Water & Sewer District currently qualifies for RUS funding at the “Poverty” level.

Additional information contained in the EPA document indicates that when annual cost of a customer’s water rates exceeds 1.5% of the local MHI, the affordability of water becomes questionable. The maximum affordability limit for a customer’s annual water rate is 2.0% of MHI. Using the current estimated annual water bill of $417, the District’s water rates currently does not exceed 2.5% of the MHI.

To project what level of affordability could be incurred if rates increase, the following information is determined.

EPA Questionable Affordability Limit (1.5% MHI) = $29,205 * 1.5% = $438.08/year
= $36.51/month

EPA Maximum Affordability Limit (2% MHI) = $29,205 * 2% = $584.10/year
= $48.68/month

The current base rate for water in the District is $34.72 per month, which means the District’s residents are paying under the maximum affordability limit for water.

Three other factors that need to be considered when evaluating ability-to-pay are the rate structures, demographics of the project area, and the economies of scale. Typically, user rates are established to increase costs as usage increases to promote water conservation. In addition, commercial and industrial customers are charged more for their base rate (or charges vary based upon the size of the tap). From a practical standpoint, the easiest way to address this issue is by setting rates based on EDU’s. However, in the South Thermopolis Water & Sewer District most of the users all have the same EDU size, except for the new WYDOD facility and a handful of others.
A rate schedule that is fair to all users should be established. If high water usage is to be discouraged, then rates should increase as water consumption goes up. On the contrary, high water usage may be something the District wishes to encourage. In that case, after covering costs via a rate schedule that assumes minimal water usage, additional use rates could be lower than the rates for the first 5,000 gallons for instance.

Water revenue should cover these main items:
- Operation and Maintenance Costs
- Water Source/Supply Costs
- Debt Retirement (to pay off Capital Construction Costs and interest)
- WWDC Repair and Maintenance Account

Currently, the South Thermopolis Water & Sewer District's treated water rate schedule is:
- $34.72 residential base rate, which includes 3,000 gallons
- $53.32 commercial base rate, which includes 7,000 gallons
- $5.80 per additional 1000 gallons

It should be at least noted that the District is currently not contributing to the EDU charge imposed by the Big Horn Regional JPB (Thermopolis is paying at $0.66/EDU/month).

I. SYSTEM COSTS

1. Capital Construction Costs

Capital construction cost estimates have been prepared for the various alternatives based on previous bids for similar facilities and quotes from suppliers. This information is included in the cost summaries shown in the numerous tables in this chapter.

2. Operation and Maintenance Costs

Costs have been developed for operation and maintenance of the proposed facilities based on costs information available from the District and other records.

3. Funding Agency Participation

Anticipated participation by potential funding sources was assumed in the cost estimates to provide an estimate of the capital construction costs to be paid by citizens.
4. WWDC Repair and Maintenance Account

Depreciation cost estimates, or estimated fees that need to be charged to pay for the depreciation, are included in the operation and maintenance costs. Depreciation costs are based on an estimated 50-year average life for the facilities. They include costs for a complete replacement of all facilities constructed under the project.

5. Projected System Costs

The following table summarizes the costs for the three options. It includes operation and maintenance, capital construction, and depreciation. The total projected costs per customer or equivalent dwelling unit are shown in Table 6.2 for Option 1, 2, 3 and 4. Estimates for the other alternatives we identified are not included since they are not technically feasible or desirable, considering other factors impacting the system. These costs were developed to allow a direct comparison of the alternatives. Input from the District and WWDC to refine cost estimates for the various options selected are not needed at this time.

### TABLE 6.2
**ANNUAL COST SUMMARY**

<table>
<thead>
<tr>
<th>Description of Cost</th>
<th>Option 1 Upper Schmidt Tank</th>
<th>Option 2 Coyote Run Tank</th>
<th>Option 3 East side of River</th>
<th>Option 4 Tank at Lane 7 and Lane 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Construction Costs</td>
<td>$78,737.31</td>
<td>$104,751.63</td>
<td>$23,222.63</td>
<td>$60,371.77</td>
</tr>
<tr>
<td>Operation &amp; Maintenance Cost Increase</td>
<td>$23,650.00</td>
<td>$40,700.00</td>
<td>$10,000</td>
<td>$23,650.00</td>
</tr>
<tr>
<td>Facility Depreciation</td>
<td>$23,350.00</td>
<td>$41,700.00</td>
<td>$0.00</td>
<td>$23,350</td>
</tr>
<tr>
<td>Total</td>
<td>$125,737.31</td>
<td>$187,151.63</td>
<td>$33,222.63</td>
<td>$33,222.63</td>
</tr>
</tbody>
</table>

### Proposed Monthly Cost for a Residential User (1 EDU)

<table>
<thead>
<tr>
<th>Description of Cost</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
<th>Option 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Construction Cost</td>
<td>$41.01</td>
<td>$51.65</td>
<td>$13.72</td>
<td>$32.88</td>
</tr>
<tr>
<td>Operation &amp; Maintenance Cost Increase</td>
<td>$12.32</td>
<td>$20.07</td>
<td>$5.91</td>
<td>$12.32</td>
</tr>
<tr>
<td>Facility Depreciation</td>
<td>$12.16</td>
<td>$20.56</td>
<td>$0.00</td>
<td>$12.16</td>
</tr>
<tr>
<td>Total (In addition to current bill)</td>
<td>$65.49</td>
<td>$92.28</td>
<td>$19.63</td>
<td>$57.36</td>
</tr>
</tbody>
</table>
J. SUMMARY OF PROJECT COSTS (2006 and 2012)

Preliminary costs were developed from bid tabulations collected from recent previous water projects completed by Engineering Associates. These bid tabs provide the bid prices from 2006 for furnishing and installing pipelines and appurtenances. These numbers can be adjusted forward to reflect the costs that can be anticipated for any particular construction year.

Engineering News Record (ENR) has been publishing a Construction Cost Index (ENR CCI) on a monthly basis for over 55 years. The February 2006 value of this index was 7689. Recently, the index has been increasing at a rate of 4% per year (based on the last 5 years). Construction costs were projected to February 2012 using a three-step process, as follows:

Bid prices received on previous similar projects were adjusted to February 2006 by applying the ratio (XXX/ENR CCI at bid date) to the bid price. The projected February 2012 ENR CCI was determined by applying an annual increase of 4% for six years to the February 2006 value of 7689. This process produced a calculated value of 9729 which was adjusted to 9800 to provide a more conservative cost estimate. February 2006 costs were projected to February 2012 by multiplying by 1.2745 (9800/7689).

For the purposes of this report, all construction was proposed for completion at one time due to the limited scope of this work. Mainline pipe costs were assumed to include pipe, fittings, trenching, backfill, and any additional earthwork, boring, miscellaneous geotechnical testing, and utility crossings as may be needed to complete the work. Service line costs include tapping saddles, corporation stops, curb stops, meters and pits, and pipe from the main to the property line. The backup information for these figures is provided in the Project Notebook.

These preliminary costs are utilized to identify the anticipated total project costs for the preferred alternative. The total project costs can then be used to evaluate potential funding scenarios to determine final EDU costs for the users of the South Thermopolis service area.
### TABLE 6.3
**OPTION 1 PROPOSED IMPROVEMENTS**
(Upper Schmidt Tank & Buffalo Creek Road Loop)

<table>
<thead>
<tr>
<th>Pipe Description</th>
<th>Length (feet)</th>
<th>Diameter</th>
<th>Class</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Loop</td>
<td>11,672</td>
<td>8&quot;</td>
<td>160</td>
<td>Buffalo Creek Rd. loop</td>
</tr>
<tr>
<td>North Line</td>
<td>3,794</td>
<td>8&quot;</td>
<td>160</td>
<td>Lane 3 to Lane 7</td>
</tr>
<tr>
<td>South Line</td>
<td>6,559</td>
<td>8&quot;</td>
<td>200</td>
<td>Lane 7 to Lane 12</td>
</tr>
<tr>
<td>West Loop</td>
<td>7,221</td>
<td>8&quot;</td>
<td>200</td>
<td>Lane 12 west/south to Rimrock Road</td>
</tr>
<tr>
<td>West Loop</td>
<td>3,055</td>
<td>8&quot;</td>
<td>160</td>
<td>Rimrock Road</td>
</tr>
<tr>
<td>Line to Tank</td>
<td>4,479</td>
<td>8&quot;</td>
<td>160</td>
<td>Sable Run to Upper Schmidt Tank</td>
</tr>
<tr>
<td>Line by Pump</td>
<td>1,768</td>
<td>10&quot;</td>
<td>267</td>
<td>Along Hwy 20 at new pump station</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>43,895</td>
</tr>
</tbody>
</table>

### TABLE 6.4
**OPTION 1 CONSTRUCTION COSTS FOR PROPOSED IMPROVEMENTS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot; HDPE CLASS 267</td>
<td>1,768</td>
<td>$58</td>
<td>$102,544</td>
</tr>
<tr>
<td>8&quot; HDPE CLASS 200</td>
<td>13,780</td>
<td>$43</td>
<td>$592,540</td>
</tr>
<tr>
<td>8&quot; HDPE CLASS 160</td>
<td>28,347</td>
<td>$38</td>
<td>$1,077,186</td>
</tr>
<tr>
<td>Pump Station</td>
<td>1 EA</td>
<td>$330,000</td>
<td>$330,000</td>
</tr>
<tr>
<td>Move/Replace Existing Tank</td>
<td>1 EA</td>
<td>$150,000</td>
<td>$150,000</td>
</tr>
<tr>
<td>PRV</td>
<td>1 EA</td>
<td>$55,000</td>
<td>$55,000</td>
</tr>
<tr>
<td>Telemetry</td>
<td>3 EA</td>
<td>$17,600</td>
<td>$52,800</td>
</tr>
<tr>
<td>Service Tap Connections</td>
<td>33 EA</td>
<td>$2,500</td>
<td>$82,500</td>
</tr>
<tr>
<td><strong>2006 Total</strong></td>
<td></td>
<td></td>
<td>$2,442,570</td>
</tr>
<tr>
<td><strong>(4% x 6 yrs) 2012 Total</strong></td>
<td></td>
<td></td>
<td>$3,113,055</td>
</tr>
</tbody>
</table>

### TABLE 6.5
**OPTION 2 PROPOSED IMPROVEMENTS**
(Coyote Run Tank & Buffalo Creek Road Loop)

<table>
<thead>
<tr>
<th>Pipe Description</th>
<th>Length (feet)</th>
<th>Diameter</th>
<th>Class</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Loop</td>
<td>11,672</td>
<td>8&quot;</td>
<td>160</td>
<td>Buffalo Creek Rd. loop</td>
</tr>
<tr>
<td>North Line</td>
<td>3,794</td>
<td>8&quot;</td>
<td>160</td>
<td>Lane 3 to Lane 7</td>
</tr>
<tr>
<td>South Line</td>
<td>7,439</td>
<td>8&quot;</td>
<td>200</td>
<td>Lane 7 to Lane 12</td>
</tr>
<tr>
<td>West Loop</td>
<td>7,221</td>
<td>8&quot;</td>
<td>200</td>
<td>Lane 12 west/south to Rimrock Road</td>
</tr>
<tr>
<td>West Loop</td>
<td>3,055</td>
<td>8&quot;</td>
<td>160</td>
<td>Rimrock Road</td>
</tr>
<tr>
<td>West Loop</td>
<td>5,347</td>
<td>8&quot;</td>
<td>160</td>
<td>Rimrock Road to Existing Tank</td>
</tr>
<tr>
<td>Line to Tank</td>
<td>13,408</td>
<td>8&quot;</td>
<td>160</td>
<td>Lane 12 to Coyote Run Tank</td>
</tr>
<tr>
<td>Line by Pump</td>
<td>1,768</td>
<td>10&quot;</td>
<td>267</td>
<td>Along Hwy 20 at new pump station</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>53,704</td>
</tr>
</tbody>
</table>
### TABLE 6.6
**OPTION 2 CONSTRUCTION COSTS FOR PROPOSED IMPROVEMENTS**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot; HDPE CLASS 267</td>
<td>1,768</td>
<td>$58</td>
<td>$102,544</td>
</tr>
<tr>
<td>8&quot; HDPE CLASS 200</td>
<td>14,660</td>
<td>$43</td>
<td>$630,380</td>
</tr>
<tr>
<td>8&quot; HDPE CLASS 160</td>
<td>37,276</td>
<td>$38</td>
<td>$1,416,488</td>
</tr>
<tr>
<td>Pump Station</td>
<td>2 EA</td>
<td>$330,000</td>
<td>$660,000</td>
</tr>
<tr>
<td>Move/Replace Existing Tank</td>
<td>1 EA</td>
<td>$150,000</td>
<td>$150,000</td>
</tr>
<tr>
<td>PRV</td>
<td>2 EA</td>
<td>$55,000</td>
<td>$110,000</td>
</tr>
<tr>
<td>Telemetry</td>
<td>5 EA</td>
<td>$17,600</td>
<td>$88,000</td>
</tr>
<tr>
<td>Service Tap Connections</td>
<td>42 EA</td>
<td>$2,500</td>
<td>$105,000</td>
</tr>
</tbody>
</table>

**2006 Total=** $3,262,412

(4% x 6 yrs) **2012 Total=** $4,157,944

---

### TABLE 6.7
**OPTION 3 PROPOSED IMPROVEMENTS**
(Buffalo Creek Road Loop only, without pump station)

<table>
<thead>
<tr>
<th>Pipe Description</th>
<th>Length (feet)</th>
<th>Diameter</th>
<th>Class</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>River Loop</td>
<td>11,672</td>
<td>8&quot;</td>
<td>160</td>
<td>Buffalo Creek Road to South Yellowstone Road</td>
</tr>
</tbody>
</table>

**Total = 11,672**

### TABLE 6.8
**OPTION 3 CONSTRUCTION COSTS FOR PROPOSED IMPROVEMENTS**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; HDPE CLASS 160</td>
<td>11,672</td>
<td>$43</td>
<td>$501,896</td>
</tr>
<tr>
<td>Service Tap Connections</td>
<td>14 EA</td>
<td>$2,500</td>
<td>$35,000</td>
</tr>
</tbody>
</table>

**2006 Total=** $536,896

(4% x 6 yrs) **2012 Total=** $684,274

### TABLE 6.9
**OPTION 4 PROPOSED IMPROVEMENTS**
(Tank near Lane 7/ Lane 12 & Buffalo Creek Road Loop)

<table>
<thead>
<tr>
<th>Pipe Description</th>
<th>Length (feet)</th>
<th>Diameter</th>
<th>Class</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Loop</td>
<td>11,672</td>
<td>8&quot;</td>
<td>160</td>
<td>Buffalo Creek Rd. loop</td>
</tr>
<tr>
<td>North Line</td>
<td>3,794</td>
<td>8&quot;</td>
<td>160</td>
<td>Lane 3 to Lane 7</td>
</tr>
<tr>
<td>South Line</td>
<td>6,559</td>
<td>8&quot;</td>
<td>200</td>
<td>Lane 7 to Lane 12</td>
</tr>
<tr>
<td>West Loop</td>
<td>1,064</td>
<td>8&quot;</td>
<td>200</td>
<td>Lane 7 to Lane 12 spur</td>
</tr>
<tr>
<td>Line by Pump</td>
<td>1,768</td>
<td>10&quot;</td>
<td>267</td>
<td>Along Hwy 20 at new pump station</td>
</tr>
<tr>
<td>East Side</td>
<td>3,301</td>
<td>8&quot;</td>
<td>160</td>
<td>Pump to Canyon View Circle</td>
</tr>
<tr>
<td>Line to Tank</td>
<td>1,891</td>
<td>8&quot;</td>
<td>160</td>
<td>Lane 7 to Tank</td>
</tr>
</tbody>
</table>

**Total = 30,049**
### TABLE 6.10

**OPTION 4 CONSTRUCTION COSTS FOR PROPOSED IMPROVEMENTS**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot; HDPE CLASS 267</td>
<td>1,768</td>
<td>$58</td>
<td>$102,544</td>
</tr>
<tr>
<td>8&quot; HDPE CLASS 200</td>
<td>7,623</td>
<td>$43</td>
<td>$327,789</td>
</tr>
<tr>
<td>8&quot; HDPE CLASS 160</td>
<td>20,658</td>
<td>$38</td>
<td>$785,004</td>
</tr>
<tr>
<td>Pump Station</td>
<td>1 EA</td>
<td>$330,000</td>
<td>$330,000</td>
</tr>
<tr>
<td>Move/Replace Existing Tank</td>
<td>1 EA</td>
<td>$150,000</td>
<td>$150,000</td>
</tr>
<tr>
<td>PRV</td>
<td>1 EA</td>
<td>$55,000</td>
<td>$55,000</td>
</tr>
<tr>
<td>Telemetry</td>
<td>3 EA</td>
<td>$17,600</td>
<td>$52,800</td>
</tr>
<tr>
<td>Service Tap Connections</td>
<td>26 EA</td>
<td>$2,500</td>
<td>$65,000</td>
</tr>
</tbody>
</table>

2006 Total = $1,868,137
(4% x 6 yrs) 2012 Total = $2,380,941

---

**K. RATE SCHEDULES**

The District’s current rate schedule does fund the operation and maintenance of the water system. The department budget for the last several years was analyzed (see Table 6.12). This budget shows both water and sewer amounts. Water makes up 72% of this budget, with the sewer having the remaining 28%. Based on the current rate schedule, the District will bill a total of approximately $111,700 annually for water. The annual cost of operating these facilities based on records from the past two years has been approximately $86,000. Table 6.11 shows the existing rate schedule.

Rate schedules can be set based on tap sizes, which correlate to EDUs (equivalent dwelling unit). The EDUs were established to consider all residential uses (5/8” meter, 5/8” x 3/4” meter, or 3/4” meter) equal to 1 EDU. Given that information, EDUs are calculated based on a ratio of the area of each meter size to a residential meter. It should be noted that tap sizes in the District are largely unknown. Because of this, meter size was used to calculate EDUs. EDU calculations are shown in Table 6.13

Tables 6.14 to 6.22 show Total Project Costs and Funding Options for the Upper Schmidt Tank Alternative, the Coyote Run Tank Alternative, the Buffalo Creek Road Loop Alternative (located on the east side of the Big Horn River), and the alternative for a tank near Lane 7 and Lane 12.
## TABLE 6.11
EXISTING WATER RATE SCHEDULE AND TREATED WATER INCOME

<table>
<thead>
<tr>
<th>Tap Size</th>
<th>EDU</th>
<th>Total Taps</th>
<th>Base Rate Per Month**</th>
<th>Cost per Usage Over 3,000 Gal for Residential and 7,000 Gal for Commercial (per 1000 Gal)</th>
<th>Average Water Usage Over 3,000 Gallons</th>
<th>Average Monthly Bill</th>
<th>Total of Monthly Bills</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>1</td>
<td>106</td>
<td>$34.72</td>
<td>$5.80</td>
<td>2,000</td>
<td>$46.32</td>
<td>$4,909.92</td>
</tr>
<tr>
<td>1 1/2&quot; *</td>
<td>4</td>
<td>3</td>
<td>$53.32</td>
<td>$5.80</td>
<td>92,000</td>
<td>$586.92</td>
<td>$2,347.68</td>
</tr>
<tr>
<td>2&quot;</td>
<td>7.11</td>
<td>1</td>
<td>$53.32</td>
<td>$5.80</td>
<td>330,000</td>
<td>$1,967.32</td>
<td>$1,967.32</td>
</tr>
</tbody>
</table>

* 1 1/2" tap serves a gas station and RV park
** Based on EDUs and includes 3,000 gallons for Residential and 7,000 for Commercial
### TABLE 6.12
**BUDGET ANALYSIS**

<table>
<thead>
<tr>
<th>Water System</th>
<th>FY2004-05</th>
<th>FY2005-06</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly service fees</td>
<td>$67,066.00</td>
<td>$74,189.00</td>
</tr>
<tr>
<td>Surcharge - Read Fee</td>
<td>$7,015.00</td>
<td>$6,964.00</td>
</tr>
<tr>
<td>Tap fees</td>
<td>$6,500.00</td>
<td>$17,500.00</td>
</tr>
<tr>
<td>Ad valorem taxes</td>
<td>$12,691.00</td>
<td>$13,799.00</td>
</tr>
<tr>
<td>Interest</td>
<td>$141.00</td>
<td>$363.00</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$0.00</td>
<td>$282.00</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>$93,413.00</td>
<td>$113,097.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water System</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expenditures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounting and Collection</td>
<td>$4,413.00</td>
<td>$4,805.00</td>
</tr>
<tr>
<td>Amortization</td>
<td>$119.00</td>
<td>$120.00</td>
</tr>
<tr>
<td>Depreciation</td>
<td>$13,814.00</td>
<td>$14,914.00</td>
</tr>
<tr>
<td>Insurance</td>
<td>$1,276.00</td>
<td>$1,219.00</td>
</tr>
<tr>
<td>Maintenance</td>
<td>$17,306.00</td>
<td>$17,155.00</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$4,257.00</td>
<td>$9,314.00</td>
</tr>
<tr>
<td>Service</td>
<td>$34,703.00</td>
<td>$48,161.00</td>
</tr>
<tr>
<td>Supplies</td>
<td>$154.00</td>
<td>$1,047.00</td>
</tr>
<tr>
<td>Telephone</td>
<td>$221.00</td>
<td>$223.00</td>
</tr>
<tr>
<td>Utilities</td>
<td>$247.00</td>
<td>$295.00</td>
</tr>
<tr>
<td>Contractor labor</td>
<td>$0.00</td>
<td>$2,379.00</td>
</tr>
<tr>
<td>Office supplies</td>
<td>$401.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Interest Expense</td>
<td>$3,200.00</td>
<td>$2,850.00</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>$80,111.00</td>
<td>$92,482.00</td>
</tr>
</tbody>
</table>

**Water Department Total**

<table>
<thead>
<tr>
<th></th>
<th>FY2004-05</th>
<th>FY2005-06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income (Loss)</td>
<td>$13,302.00</td>
<td>$20,615.00</td>
</tr>
<tr>
<td>Total Net Assets, beginning of year *</td>
<td>$400,651.00</td>
<td>$409,923.00</td>
</tr>
<tr>
<td>Total Net Assets, end of year *</td>
<td>$409,923.00</td>
<td>$420,493.00</td>
</tr>
</tbody>
</table>

* Includes Water and Sewer Assets

### EXISTING LOANS

<table>
<thead>
<tr>
<th>Loan Type</th>
<th>Interest</th>
<th>Term</th>
<th>Borrowed Amt</th>
<th>Payoff Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capmark GO Bond</td>
<td>5.0%</td>
<td>29 yrs 3 Months</td>
<td>$150,000.00</td>
<td>11/1/2011</td>
</tr>
</tbody>
</table>

| Annual Payment Amount (P+I) | $5,000 |
### TABLE 6.13
**EDU CALCULATIONS**

**EDU EQUATION**

\[
\text{5/8\" and 3/4\" METER/TAP} = 1 \text{ EDU} \quad \text{EQUIVALENT EDU} = \frac{(\text{TAP SIZE})^2}{(3/4)^2}
\]

**DEBT SERVICE CALCULATIONS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Existing Outstanding Loans</td>
<td>$44,650</td>
</tr>
<tr>
<td>As of June 30, 2006</td>
<td></td>
</tr>
<tr>
<td>Total Existing Debt Service</td>
<td>$44,650</td>
</tr>
<tr>
<td>Existing Debt Service Per Tap</td>
<td>$402.25</td>
</tr>
<tr>
<td>Existing Debt Service Per EDU</td>
<td>$351.88</td>
</tr>
<tr>
<td>South Thermop Median Household Income</td>
<td>$29,205.00</td>
</tr>
<tr>
<td>State Median Household Income</td>
<td>$37,892.00</td>
</tr>
<tr>
<td><strong>South Thermop MHI to State MHI</strong></td>
<td><strong>77.1%</strong> Qualifies for RUS Funding - Poverty Level</td>
</tr>
<tr>
<td><strong>Debt Service/EDU to MHI</strong></td>
<td><strong>1.20%</strong> Qualifies for RUS Funding - Poverty Level</td>
</tr>
</tbody>
</table>
TABLE 6.14
PROPOSED PROJECT DESCRIPTION – OPTION 1

SOUTH THERMOPOLIS WATER AND SEWER DISTRICT - LEVEL 1 STUDY
ESTIMATED PROJECT COSTS - 2012 PRICES

PROPOSED PROJECT OPTION/DESCRIPTION: OPTION 1 - BUFFALO CREEK RD LOOP AND UPPER SCHMIDT TANK

<table>
<thead>
<tr>
<th>COSTS OF PROJECT COMPONENTS</th>
<th>TOTAL COST</th>
<th>ELIGIBLE FOR WWDC FUNDING</th>
<th>ELIGIBLE FOR RUS FUNDING</th>
<th>ELIGIBLE FOR OSLIB FUNDING</th>
<th>SRF FUNDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot; HDPE CL 267 TRANSMISSION LINES</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
</tr>
<tr>
<td>8&quot; HDPE CL 160 TRANSMISSION LINES</td>
<td>$1,372,873.56</td>
<td>$1,372,873.56</td>
<td>$1,372,873.56</td>
<td>$1,372,873.56</td>
<td>$1,372,873.56</td>
</tr>
<tr>
<td>PUMP STATION</td>
<td>$420,585.00</td>
<td>$420,585.00</td>
<td>$420,585.00</td>
<td>$420,585.00</td>
<td>$420,585.00</td>
</tr>
<tr>
<td>MOVE/REPLACE TANK (250,000 GALLONS)</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
</tr>
<tr>
<td>PRESSURE REDUCING VALVE STATION</td>
<td>$70,097.50</td>
<td>$70,097.50</td>
<td>$70,097.50</td>
<td>$70,097.50</td>
<td>$70,097.50</td>
</tr>
<tr>
<td>TELEMETRY</td>
<td>$67,293.60</td>
<td>$67,293.60</td>
<td>$67,293.60</td>
<td>$67,293.60</td>
<td>$67,293.60</td>
</tr>
<tr>
<td>33 SERVICE TAP CONNECTIONS</td>
<td>$105,146.25</td>
<td>$0.00</td>
<td>$105,146.25</td>
<td>$0.00</td>
<td>$105,146.25</td>
</tr>
<tr>
<td>CONSTRUCTION COST SUBTOTAL NO. 1</td>
<td>$3,113,055.47</td>
<td>$3,007,909.22</td>
<td>$3,113,055.47</td>
<td>$3,007,909.22</td>
<td>$3,113,055.47</td>
</tr>
<tr>
<td>ENGINEERING CONSTRUCTION COSTS (SUB NO. 1 * 10%)</td>
<td>$311,305.55</td>
<td>$300,790.92</td>
<td>$311,305.55</td>
<td>$300,790.92</td>
<td>$311,305.55</td>
</tr>
<tr>
<td>CONSTRUCTION COST SUBTOTAL NO. 2</td>
<td>$3,424,361.01</td>
<td>$3,308,700.14</td>
<td>$3,424,361.01</td>
<td>$3,308,700.14</td>
<td>$3,424,361.01</td>
</tr>
<tr>
<td>CONTINGENCY (SUB NO. 2 * 15%)</td>
<td>$513,654.15</td>
<td>$496,305.02</td>
<td>$513,654.15</td>
<td>$496,305.02</td>
<td>$513,654.15</td>
</tr>
<tr>
<td>CONSTRUCTION COST TOTAL</td>
<td>$3,938,015.16</td>
<td>$3,805,005.16</td>
<td>$3,938,015.16</td>
<td>$3,805,005.16</td>
<td>$3,938,015.16</td>
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<tr>
<td>FINAL DESIGN AND SPECIFICATIONS - 10%</td>
<td>$393,801.52</td>
<td>$360,500.52</td>
<td>$393,801.52</td>
<td>$360,500.52</td>
<td>$393,801.52</td>
</tr>
<tr>
<td>PERMITTING AND MITIGATION - 1.5%</td>
<td>$59,070.23</td>
<td>$57,075.08</td>
<td>$59,070.23</td>
<td>$57,075.08</td>
<td>$59,070.23</td>
</tr>
<tr>
<td>LEGAL FEES - 2%</td>
<td>$78,760.30</td>
<td>$76,100.10</td>
<td>$78,760.30</td>
<td>$76,100.10</td>
<td>$78,760.30</td>
</tr>
<tr>
<td>ACQUISITION OF ACCESS &amp; RIGHTS-OF-WAY - 1.5%</td>
<td>$59,070.23</td>
<td>$57,075.08</td>
<td>$59,070.23</td>
<td>$57,075.08</td>
<td>$59,070.23</td>
</tr>
<tr>
<td>TOTAL PROJECT COSTS</td>
<td>$4,528,717.44</td>
<td>$4,375,755.93</td>
<td>$4,528,717.44</td>
<td>$4,375,755.93</td>
<td>$4,528,717.44</td>
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TOTAL PROJECT COSTS $4,528,717.44
PROJECT SPONSOR FUNDING $45,287.17 1% FROM SOUTH THERMOPOLIS WATER DISTRICT
ADDITIONAL FUNDING REQUIRED $4,483,430.26

TYPE OF FUNDING PROJECT QUALIFIES FOR: WWDC RUS SRF OSLIB

<table>
<thead>
<tr>
<th>FUNDING AGENCY</th>
<th>PERCENTAGE OF TOTAL FUNDING</th>
<th>PERCENTAGE OF ELIGIBLE FUNDING</th>
<th>GRANT/LOAN AMOUNTS</th>
<th>CAPITAL RECOVERY FACTORS</th>
<th>DEBT SERVICE PER YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWDC GRANT</td>
<td>65.4%</td>
<td>67%</td>
<td>$2,931,756.47</td>
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<tr>
<td>WWDC LOAN - 4.0% at 20 Years</td>
<td>Not Used</td>
<td>Not Used</td>
<td>0.0735818</td>
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<td>$ -</td>
</tr>
<tr>
<td>OSLIB GRANT</td>
<td>Not Used</td>
<td>Not Used</td>
<td>0.0871846</td>
<td></td>
<td>$ -</td>
</tr>
<tr>
<td>OSLIB LOAN - 6% at 20 Years</td>
<td>Not Used</td>
<td>Not Used</td>
<td>0.0871846</td>
<td></td>
<td>$ -</td>
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<tr>
<td>DWSRF LOAN - 2.5% at 20 Years</td>
<td>21.3% Remaining</td>
<td>$953,883.09</td>
<td>0.0641471</td>
<td>$ 61,188.86</td>
<td>$ -</td>
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<tr>
<td>RUS GRANT</td>
<td>6.7%</td>
<td>20%</td>
<td>$298,895.35</td>
<td></td>
<td>$ -</td>
</tr>
<tr>
<td>RUS LOAN - 4.125% at 30 Years</td>
<td>6.7%</td>
<td>80%</td>
<td>$298,895.35</td>
<td>0.0587110</td>
<td>$17,548.44</td>
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<tr>
<td>TOTALS</td>
<td></td>
<td></td>
<td>$4,483,430.26</td>
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<td>$78,737.31</td>
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</table>

Additional Annual Debt Service per EDU $492.11
Additional Monthly Debt Service per EDU $41.01
### Table 6.15
**PROPOSED PROJECT DESCRIPTION – OPTION 2**

**PROPOSED PROJECT OPTION/DESCRIPTION:** OPTION 2 - BUFFALO CREEK RD LOOP AND COYOTE RUN TANK

<table>
<thead>
<tr>
<th>COSTS OF PROJECT COMPONENTS</th>
<th>TOTAL COST</th>
<th>ELIGIBLE FOR WWDC FUNDING</th>
<th>ELIGIBLE FOR RUS FUNDING</th>
<th>ELIGIBLE FOR OSLIB FUNDING</th>
<th>SRF FUNDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot; HDPE CL 267 TRANSMISSION LINES</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
</tr>
<tr>
<td>8&quot; HDPE CL 200 TRANSMISSION LINES</td>
<td>$803,419.31</td>
<td>$803,419.31</td>
<td>$803,419.31</td>
<td>$803,419.31</td>
<td>$803,419.31</td>
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<tr>
<td>8&quot; HDPE CL 160 TRANSMISSION LINES</td>
<td>$1,805,313.96</td>
<td>$1,805,313.96</td>
<td>$1,805,313.96</td>
<td>$1,805,313.96</td>
<td>$1,805,313.96</td>
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<tr>
<td>PUMP STATION</td>
<td>$841,170.00</td>
<td>$841,170.00</td>
<td>$841,170.00</td>
<td>$841,170.00</td>
<td>$841,170.00</td>
</tr>
<tr>
<td>MOVE/REPLACE TANK (250,000 GALLONS)</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
</tr>
<tr>
<td>PRESSURE REDUCING VALVE STATION</td>
<td>$140,195.00</td>
<td>$140,195.00</td>
<td>$140,195.00</td>
<td>$140,195.00</td>
<td>$140,195.00</td>
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<tr>
<td>TELEMETRY</td>
<td>$112,156.00</td>
<td>$112,156.00</td>
<td>$112,156.00</td>
<td>$112,156.00</td>
<td>$112,156.00</td>
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<tr>
<td>42 SERVICE TAP CONNECTIONS</td>
<td>$133,822.50</td>
<td>$133,822.50</td>
<td>$133,822.50</td>
<td>$0.00</td>
<td>$0.00</td>
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<tr>
<td>CONSTRUCTION COST SUBTOTAL NO. 1</td>
<td>$4,157,944.09</td>
<td>$4,024,121.59</td>
<td>$4,157,944.09</td>
<td>$4,024,121.59</td>
<td>$4,157,944.09</td>
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<tr>
<td>ENGINEERING CONSTRUCTION COSTS (SUB NO. 1 * 10%)</td>
<td>$415,794.41</td>
<td>$402,412.16</td>
<td>$415,794.41</td>
<td>$402,412.16</td>
<td>$415,794.41</td>
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<tr>
<td>CONSTRUCTION COST SUBTOTAL NO. 2</td>
<td>$4,573,738.50</td>
<td>$4,426,533.75</td>
<td>$4,573,738.50</td>
<td>$4,426,533.75</td>
<td>$4,573,738.50</td>
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<tr>
<td>CONTINGENCY (SUB NO. 2 * 15%)</td>
<td>$686,060.78</td>
<td>$663,980.06</td>
<td>$686,060.78</td>
<td>$663,980.06</td>
<td>$686,060.78</td>
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<tr>
<td>CONSTRUCTION COST TOTAL</td>
<td>$5,259,799.28</td>
<td>$5,090,513.82</td>
<td>$5,259,799.28</td>
<td>$5,090,513.82</td>
<td>$5,259,799.28</td>
</tr>
<tr>
<td>FINAL DESIGN AND SPECIFICATIONS - 10%</td>
<td>$525,979.93</td>
<td>$509,051.38</td>
<td>$525,979.93</td>
<td>$509,051.38</td>
<td>$525,979.93</td>
</tr>
<tr>
<td>PERMITTING AND MITIGATION - 1.5%</td>
<td>$78,896.99</td>
<td>$76,357.71</td>
<td>$78,896.99</td>
<td>$76,357.71</td>
<td>$78,896.99</td>
</tr>
<tr>
<td>LEGAL FEES - 2%</td>
<td>$105,195.99</td>
<td>$101,810.28</td>
<td>$105,195.99</td>
<td>$101,810.28</td>
<td>$105,195.99</td>
</tr>
<tr>
<td>ACQUISITION OF ACCESS &amp; RIGHTS-OF-WAY - 1.5%</td>
<td>$78,896.99</td>
<td>$76,357.71</td>
<td>$78,896.99</td>
<td>$76,357.71</td>
<td>$78,896.99</td>
</tr>
<tr>
<td>TOTAL PROJECT COSTS</td>
<td>$6,048,769.17</td>
<td>$5,854,090.89</td>
<td>$6,048,769.17</td>
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<td>PROJECT SPONSOR FUNDING</td>
<td>$60,487.69</td>
<td>1% FROM SOUTH THERMOPOLIS WATER DISTRICT</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ADDITIONAL FUNDING REQUIRED</td>
<td>$5,988,281.48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TYPE OF FUNDING PROJECT QUALIFIES FOR:**
- WWDC
- RUS
- SRF
- OSLIB

<table>
<thead>
<tr>
<th>FUNDING AGENCY</th>
<th>PERCENTAGE OF TOTAL FUNDING</th>
<th>PERCENTAGE OF ELIGIBLE FUNDING</th>
<th>GRANT/LOAN AMOUNTS</th>
<th>CAPITAL RECOVERY FACTORS</th>
<th>DEBT SERVICE PER YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWDC GRANT</td>
<td>65.5%</td>
<td>67%</td>
<td>$3,922,240.90</td>
<td>$0.073581</td>
<td>$ -</td>
</tr>
<tr>
<td>WWDC LOAN - 4.0% at 20 Years</td>
<td>Not Used</td>
<td>Not Used</td>
<td>Not Used</td>
<td>$0.073581</td>
<td>$ -</td>
</tr>
<tr>
<td>OSLIB GRANT</td>
<td>Not Used</td>
<td>Not Used</td>
<td>Not Used</td>
<td>$0.073581</td>
<td>$ -</td>
</tr>
<tr>
<td>OSLIB LOAN - 6% at 20 Years</td>
<td>Not Used</td>
<td>Not Used</td>
<td>Not Used</td>
<td>$0.073581</td>
<td>$ -</td>
</tr>
<tr>
<td>DWSRF LOAN - 2.5% at 20 Years</td>
<td>27.2%</td>
<td>Remaining</td>
<td>$1,267,603.05</td>
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<td>$81,313.10</td>
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<td>RUS GRANT</td>
<td>6.7%</td>
<td>20%</td>
<td>$399,218.77</td>
<td>$0.0587110</td>
<td>$23,438.53</td>
</tr>
<tr>
<td>RUS LOAN - 4.125% at 30 Years</td>
<td>8%</td>
<td>80%</td>
<td>$399,218.77</td>
<td>$0.0587110</td>
<td>$23,438.53</td>
</tr>
<tr>
<td>TOTALS</td>
<td>100%</td>
<td></td>
<td>$5,988,281.48</td>
<td>$104,751.63</td>
<td>$169</td>
</tr>
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</table>

Total EDUs: 169
- Additional Annual Debt Service per EDU: $619.83
- Additional Monthly Debt Service per EDU: $51.65

Total Taps: 153
- Additional Annual Debt Service per Tap: $684.65
- Additional Monthly Debt Service per Tap: $57.05
**TABLE 6.16**

**PROPOSED PROJECT DESCRIPTION – OPTION 3**

**PROPOSED PROJECT OPTION/DESCRIPTION:**  
**OPTION 3 - BUFFALO CREEK RD LOOP (EAST OF RIVER)**  

(WITHOUT PUMP STATION)

<table>
<thead>
<tr>
<th>COSTS OF PROJECT COMPONENTS</th>
<th>TOTAL COST</th>
<th>ELIGIBLE FOR WWDC FUNDING</th>
<th>ELIGIBLE FOR RUS FUNDING</th>
<th>ELIGIBLE FOR OSLIB FUNDING</th>
<th>SRF FUNDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; HDPE CL 200 TRANSMISSION LINES</td>
<td>$639,666.45</td>
<td>$639,666.45</td>
<td>$639,666.45</td>
<td>$639,666.45</td>
<td>$639,666.45</td>
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<tr>
<td>14 SERVICE TAP CONNECTIONS</td>
<td>$44,607.50</td>
<td>$0.00</td>
<td>$44,607.50</td>
<td>$44,607.50</td>
<td>$44,607.50</td>
</tr>
<tr>
<td>CONSTRUCTION COST SUBTOTAL NO. 1</td>
<td>$684,273.95</td>
<td>$639,666.45</td>
<td>$684,273.95</td>
<td>$639,666.45</td>
<td>$684,273.95</td>
</tr>
<tr>
<td>ENGINEERING CONSTRUCTION COSTS (SUB NO. 1 * 10%)</td>
<td>$68,427.40</td>
<td>$63,966.65</td>
<td>$68,427.40</td>
<td>$63,966.65</td>
<td>$68,427.40</td>
</tr>
<tr>
<td>CONSTRUCTION COST SUBTOTAL NO. 2</td>
<td>$752,701.35</td>
<td>$703,633.10</td>
<td>$752,701.35</td>
<td>$703,633.10</td>
<td>$752,701.35</td>
</tr>
<tr>
<td>CONTINGENCY (SUB NO. 2 * 15%)</td>
<td>$112,905.20</td>
<td>$105,544.96</td>
<td>$112,905.20</td>
<td>$105,544.96</td>
<td>$112,905.20</td>
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<tr>
<td>CONSTRUCTION COST TOTAL</td>
<td>$865,606.55</td>
<td>$809,178.06</td>
<td>$865,606.55</td>
<td>$809,178.06</td>
<td>$865,606.55</td>
</tr>
<tr>
<td>FINAL DESIGN AND SPECIFICATIONS - 10%</td>
<td>$86,560.65</td>
<td>$80,917.81</td>
<td>$86,560.65</td>
<td>$80,917.81</td>
<td>$86,560.65</td>
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<tr>
<td>PERMITTING AND MITIGATION - 1.5%</td>
<td>$12,984.10</td>
<td>$12,137.67</td>
<td>$12,984.10</td>
<td>$12,137.67</td>
<td>$12,984.10</td>
</tr>
<tr>
<td>LEGAL FEES - 2%</td>
<td>$17,312.13</td>
<td>$16,183.56</td>
<td>$17,312.13</td>
<td>$16,183.56</td>
<td>$17,312.13</td>
</tr>
<tr>
<td>ACQUISITION OF ACCESS &amp; RIGHTS-OF-WAY - 1.5%</td>
<td>$12,984.10</td>
<td>$12,137.67</td>
<td>$12,984.10</td>
<td>$12,137.67</td>
<td>$12,984.10</td>
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<tr>
<td>TOTAL PROJECT COSTS</td>
<td>$995,447.53</td>
<td>$930,554.77</td>
<td>$995,447.53</td>
<td>$930,554.77</td>
<td>$995,447.53</td>
</tr>
</tbody>
</table>

**PROJECT SPONSOR FUNDING**  
$9,954.48 1% FROM SOUTH THERMOPOLIS WATER DISTRICT

**ADDITIONAL FUNDING REQUIRED**  
$985,493.06

**TYPE OF FUNDING PROJECT QUALIFIES FOR:**  
WWDC  
RUS  
SRF  
OSLIB

<table>
<thead>
<tr>
<th>FUNDING AGENCY</th>
<th>PERCENTAGE OF TOTAL FUNDING</th>
<th>PERCENTAGE OF ELIGIBLE FUNDING</th>
<th>GRANT/LOAN AMOUNTS</th>
<th>CAPITAL RECOVERY FACTORS</th>
<th>DEBT SERVICE PER YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWDC GRANT</td>
<td>62.6%</td>
<td>67%</td>
<td>$623,471.70</td>
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<td>$ -</td>
</tr>
<tr>
<td>WWDC LOAN - 4.0% at 20 Years</td>
<td>Not Used</td>
<td>Not Used</td>
<td>$ -</td>
<td></td>
<td>$ -</td>
</tr>
<tr>
<td>OSLIB GRANT</td>
<td>Not Used</td>
<td>Not Used</td>
<td>$ -</td>
<td></td>
<td>$ -</td>
</tr>
<tr>
<td>OSLIB LOAN - 6% at 20 Years</td>
<td>Not Used</td>
<td>Not Used</td>
<td>$ -</td>
<td></td>
<td>$ -</td>
</tr>
<tr>
<td>DWSRDF LOAN - 2.5% at 20 Years</td>
<td>36.4%</td>
<td>Remaining</td>
<td>$362,921.36</td>
<td>0.0641471</td>
<td>$23,222.63</td>
</tr>
<tr>
<td>RUS GRANT</td>
<td>Not Used</td>
<td>Not Used</td>
<td>$ -</td>
<td></td>
<td>$ -</td>
</tr>
<tr>
<td>RUS LOAN - 4.125% at 30 Years</td>
<td>Not Used</td>
<td>Not Used</td>
<td>$ -</td>
<td></td>
<td>$ -</td>
</tr>
<tr>
<td>TOTALS</td>
<td>$985,493.06</td>
<td></td>
<td>$23,222.63</td>
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<td>$ -</td>
</tr>
</tbody>
</table>

**Total EDUS**  
141

**Additional Annual Debt Service per EDU**  
$164.70

**Additional Monthly Debt Service per EDU**  
$13.72

**Total Taps**  
125

**Additional Annual Debt Service per Tap**  
$185.78

**Additional Monthly Debt Service per Tap**  
$15.48
TABLE 6.17
PROPOSED PROJECT DESCRIPTION – OPTION 4

SOUTH THERMOPOLIS WATER AND SEWER DISTRICT - LEVEL 1 STUDY
ESTIMATED PROJECT COSTS - 2012 PRICES

PROPOSED PROJECT OPTION/DESCRIPTION: OPTION 4 - LANE 7/LANE 12 TANK SITE & BUFFALO CREEK ROAD LOOP

<table>
<thead>
<tr>
<th>COSTS OF PROJECT COMPONENTS</th>
<th>TOTAL COST</th>
<th>ELIGIBLE FOR WWDC FUNDING</th>
<th>ELIGIBLE FOR RUS FUNDING</th>
<th>ELIGIBLE FOR OSLIB FUNDING</th>
<th>SRF FUNDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot; HDPE CL 267 TRANSMISSION LINES</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
<td>$130,692.33</td>
</tr>
<tr>
<td>8&quot; HDPE CL 200 TRANSMISSION LINES</td>
<td>$417,767.08</td>
<td>$417,767.08</td>
<td>$417,767.08</td>
<td>$417,767.08</td>
<td>$417,767.08</td>
</tr>
<tr>
<td>8&quot; HDPE CL 160 TRANSMISSION LINES</td>
<td>$1,000,487.60</td>
<td>$1,000,487.60</td>
<td>$1,000,487.60</td>
<td>$1,000,487.60</td>
<td>$1,000,487.60</td>
</tr>
<tr>
<td>PUMP STATION</td>
<td>$420,585.00</td>
<td>$420,585.00</td>
<td>$420,585.00</td>
<td>$420,585.00</td>
<td>$420,585.00</td>
</tr>
<tr>
<td>MOVE/REPLACE TANK (250,000 GALLONS)</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
<td>$191,175.00</td>
</tr>
<tr>
<td>PRESSURE REDUCING VALVE STATION</td>
<td>$70,097.50</td>
<td>$70,097.50</td>
<td>$70,097.50</td>
<td>$70,097.50</td>
<td>$70,097.50</td>
</tr>
<tr>
<td>TELEMETRY</td>
<td>$67,293.60</td>
<td>$67,293.60</td>
<td>$67,293.60</td>
<td>$67,293.60</td>
<td>$67,293.60</td>
</tr>
<tr>
<td>26 SERVICE TAP CONNECTIONS</td>
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<td>$82,842.50</td>
<td>$82,842.50</td>
<td>$82,842.50</td>
<td>$82,842.50</td>
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</tbody>
</table>

CONSTRUCTION COST SUBTOTAL NO. 1 | $2,380,940.61 | $2,298,098.11 | $2,380,940.61 | $2,298,098.11 | $2,380,940.61 |

ENGINEERING CONSTRUCTION COSTS (SUB NO. 1 * 10%) | $238,094.06 | $229,809.81 | $238,094.06 | $229,809.81 | $238,094.06 |

CONSTRUCTION COST SUBTOTAL NO. 2 | $2,619,034.67 | $2,527,907.92 | $2,619,034.67 | $2,527,907.92 | $2,619,034.67 |

CONTINGENCY (SUB NO. 2 * 15%) | $392,855.20 | $379,186.19 | $392,855.20 | $379,186.19 | $392,855.20 |

CONSTRUCTION COST TOTAL | $3,011,889.87 | $2,907,094.10 | $3,011,889.87 | $2,907,094.10 | $3,011,889.87 |

FINAL DESIGN AND SPECIFICATIONS - 10% | $301,188.99 | $290,709.41 | $301,188.99 | $290,709.41 | $301,188.99 |

PERMITTING AND MITIGATION - 1.5% | $45,178.35 | $43,606.41 | $45,178.35 | $43,606.41 | $45,178.35 |

LEGAL FEES - 2% | $60,237.80 | $58,141.88 | $60,237.80 | $58,141.88 | $60,237.80 |

ACQUISITION OF ACCESS & RIGHTS-OF-WAY - 1.5% | $45,178.35 | $43,606.41 | $45,178.35 | $43,606.41 | $45,178.35 |

TOTAL PROJECT COSTS | $3,463,673.35 | $3,343,158.22 | $3,463,673.35 | $3,343,158.22 | $3,463,673.35 |

TOTAL PROJECT COSTS | $3,463,673.35 |

PROJECT SPONSOR FUNDING | $34,636.73 | 1% FROM SOUTH THERMOPOLIS WATER DISTRICT |

ADDITIONAL FUNDING REQUIRED | $3,429,036.61 |

TYPE OF FUNDING PROJECT QUALIFIES FOR: WWDC, RUS, SRF, OSLIB

<table>
<thead>
<tr>
<th>FUNDING AGENCY</th>
<th>PERCENTAGE OF TOTAL FUNDING</th>
<th>PERCENTAGE OF ELIGIBLE FUNDING</th>
<th>GRANT/LOAN AMOUNTS</th>
<th>CAPITAL RECOVERY FACTORS</th>
<th>DEBT SERVICE PER YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWDC GRANT</td>
<td>65.3%</td>
<td>67%</td>
<td>$2,239,161.01</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>WWDC LOAN - 4.0% at 20 Years</td>
<td>Not Used</td>
<td>Not Used</td>
<td>0.0735818</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>OSLIB GRANT</td>
<td>Not Used</td>
<td>Not Used</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSLIB LOAN - 6% at 20 Years</td>
<td>Not Used</td>
<td>Not Used</td>
<td>0.0871846</td>
<td>-</td>
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<tr>
<td>DWSRF LOAN - 2.5% at 20 Years</td>
<td>21.3%</td>
<td>Remaining</td>
<td>$731,915.72</td>
<td>0.0641741</td>
<td>$46,950.29</td>
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<tr>
<td>RUS GRANT</td>
<td>6.7%</td>
<td>20%</td>
<td>$228,602.44</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>RUS LOAN - 4.125% at 30 Years</td>
<td>6.7%</td>
<td>80%</td>
<td>$228,602.44</td>
<td>0.0587110</td>
<td>$13,421.48</td>
</tr>
</tbody>
</table>

TOTALS | $3,429,036.61 | $60,371.77 | | | |
### TABLE 6.18
RECOMMENDED WATER RATE SCHEDULE FOR EXISTING SYSTEM

<table>
<thead>
<tr>
<th>Tap Size</th>
<th>EDU</th>
<th>Total Taps</th>
<th>Base Rate Per Month**</th>
<th>Cost per Usage Over 3,000 Gallons (per 1000 Gallons)</th>
<th>Average Water Usage Over 3,000 Gallons</th>
<th>Average Monthly Bill</th>
<th>Total of Monthly Bills</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>1</td>
<td>106</td>
<td>$34.72</td>
<td>$5.80</td>
<td>2,000</td>
<td>$46.32</td>
<td>$4,909.92</td>
</tr>
<tr>
<td>1 1/2&quot;*</td>
<td>4</td>
<td>3</td>
<td>$138.88</td>
<td>$5.80</td>
<td>92,000</td>
<td>$672.48</td>
<td>$2,689.92</td>
</tr>
<tr>
<td>2&quot;</td>
<td>7.11</td>
<td>1</td>
<td>$243.04</td>
<td>$5.80</td>
<td>330,000</td>
<td>$2,157.04</td>
<td>$2,157.04</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$9,756.88</td>
</tr>
</tbody>
</table>

* 1 1/2" tap serves a gas station and RV park
** Based on EDUs and includes 3,000 gallons for Residential and 7,000 for Commercial

### TABLE 6.19
RECOMMENDED WATER RATE SCHEDULE FOR OPTION 1
(TOTAL USER COST - CALCULATED PER EDU)

<table>
<thead>
<tr>
<th>Tap Size</th>
<th>EDU</th>
<th>Total Taps</th>
<th>Base Rate Per Month**</th>
<th>Cost per Usage Over 3,000 Gallons (per 1000 Gallons)</th>
<th>Average Water Usage Over 3,000 Gallons</th>
<th>Average Monthly Bill (includes existing costs &amp; new option)</th>
<th>Total of Monthly Bills</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>1</td>
<td>140</td>
<td>$75.73</td>
<td>$5.80</td>
<td>2,000</td>
<td>$87.33</td>
<td>$12,226.20</td>
</tr>
<tr>
<td>1 1/2&quot;*</td>
<td>4</td>
<td>3</td>
<td>$303.00</td>
<td>$5.80</td>
<td>92,000</td>
<td>$836.60</td>
<td>$3,346.40</td>
</tr>
<tr>
<td>2&quot;</td>
<td>7.11</td>
<td>1</td>
<td>$530.07</td>
<td>$5.80</td>
<td>330,000</td>
<td>$2,444.07</td>
<td>$2,444.07</td>
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<tr>
<td><strong>Total</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$18,016.67</td>
</tr>
</tbody>
</table>

* 1 1/2" tap serves a gas station and RV park
** Based on EDUs and includes 3,000 gallons for Residential and 7,000 for Commercial

### TABLE 6.20
RECOMMENDED WATER RATE SCHEDULE FOR OPTION 2
(TOTAL USER COST - CALCULATED PER EDU)

<table>
<thead>
<tr>
<th>Tap Size</th>
<th>EDU</th>
<th>Total Taps</th>
<th>Base Rate Per Month**</th>
<th>Cost per Usage Over 3,000 Gallons (per 1000 Gallons)</th>
<th>Average Water Usage Over 3,000 Gallons</th>
<th>Average Monthly Bill (includes existing costs &amp; new option)</th>
<th>Total of Monthly Bills</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>1</td>
<td>148</td>
<td>$86.37</td>
<td>$5.80</td>
<td>2,000</td>
<td>$97.97</td>
<td>$14,499.56</td>
</tr>
<tr>
<td>1 1/2&quot;*</td>
<td>4</td>
<td>3</td>
<td>$345.60</td>
<td>$5.80</td>
<td>92,000</td>
<td>$879.20</td>
<td>$3,516.80</td>
</tr>
<tr>
<td>2&quot;</td>
<td>7.11</td>
<td>1</td>
<td>$604.55</td>
<td>$5.80</td>
<td>330,000</td>
<td>$2,518.55</td>
<td>$2,518.55</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$20,534.91</td>
</tr>
</tbody>
</table>

* 1 1/2" tap serves a gas station and RV park
** Based on EDUs and includes 3,000 gallons for Residential and 7,000 for Commercial
### TABLE 6.21
RECOMMENDED WATER RATE SCHEDULE FOR OPTION 3
(TOTAL USER COST - CALCULATED PER EDU)

<table>
<thead>
<tr>
<th>Tap Size</th>
<th>EDU</th>
<th>Total Taps</th>
<th>Base Rate Per Month**</th>
<th>Cost per Usage Over 3,000 Gallons (per 1000 Gallons)</th>
<th>Average Water Usage Over 3,000 Gallons</th>
<th>Average Monthly Bill (includes existing costs &amp; new option)</th>
<th>Total of Monthly Bills</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>1</td>
<td>120</td>
<td>$48.44</td>
<td>$5.80</td>
<td>2,000</td>
<td>$60.04</td>
<td>$7,204.80</td>
</tr>
<tr>
<td>1 1/2&quot; *</td>
<td>4</td>
<td>3</td>
<td>$193.88</td>
<td>$5.80</td>
<td>92,000</td>
<td>$727.48</td>
<td>$2,909.92</td>
</tr>
<tr>
<td>2&quot;</td>
<td>7.11</td>
<td>1</td>
<td>$339.04</td>
<td>$5.80</td>
<td>330,000</td>
<td>$2,253.04</td>
<td>$2,253.04</td>
</tr>
</tbody>
</table>

* 1 1/2" tap serves a gas station and RV park
** Based on EDUs and includes 3,000 gallons for Residential and 7,000 for Commercial

### TABLE 6.22
RECOMMENDED WATER RATE SCHEDULE FOR OPTION 4
(TOTAL USER COST - CALCULATED PER EDU)

<table>
<thead>
<tr>
<th>Tap Size</th>
<th>EDU</th>
<th>Total Taps</th>
<th>Base Rate Per Month**</th>
<th>Cost per Usage Over 3,000 Gallons (per 1000 Gallons)</th>
<th>Average Water Usage Over 3,000 Gallons</th>
<th>Average Monthly Bill (includes existing costs &amp; new option)</th>
<th>Total of Monthly Bills</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>1</td>
<td>133</td>
<td>$67.60</td>
<td>$5.80</td>
<td>2,000</td>
<td>$79.20</td>
<td>$10,533.60</td>
</tr>
<tr>
<td>1 1/2&quot; *</td>
<td>4</td>
<td>3</td>
<td>$270.40</td>
<td>$5.80</td>
<td>92,000</td>
<td>$804.00</td>
<td>$3,216.00</td>
</tr>
<tr>
<td>2&quot;</td>
<td>7.11</td>
<td>1</td>
<td>$480.64</td>
<td>$5.80</td>
<td>330,000</td>
<td>$2,394.64</td>
<td>$2,394.64</td>
</tr>
</tbody>
</table>

* 1 1/2" tap serves a gas station and RV park
** Based on EDUs and includes 3,000 gallons for Residential and 7,000 for Commercial

55
CHAPTER SEVEN
ROLES AND REGULATORY REQUIREMENTS

A. ROLE OF THE OPERATOR

1. Qualifications

The water system operator is responsible for insuring the safety of water delivered to customers supplied by their water system. They must have experience and knowledge in the following areas:

- Maintenance and repair of pumping equipment;
- Chlorination practices;
- Chlorine safety procedures;
- Operational characteristics of mechanical equipment used in the maintenance of cross connection and backflow prevention devices;
- Safe and efficient work practices and methods;
- Mathematic principles pertinent to water treatment calculations;
- Drinking Water Regulations as required by the State of Wyoming.

2. Operation and Maintenance

The water system operator is responsible for maintenance of existing water distribution facilities to ensure correct and safe operation. This includes flushing the system at regular intervals, replacing hydrants, maintaining and cleaning pumps, and maintaining and cleaning other system components. The system operator is required to perform periodic sampling to ensure that water quality is maintained throughout the system. A copy of the proposed operation and maintenance plan and schedule are included in Appendix C.

3. Certifications

South Thermopolis’ water system operator must have a Level 1 certification, as defined by Wyoming DEQ, to operate the system. This certification requires the operator to have six months of experience, 35 contact hours (training, workshops, college courses, etc.), and successful completion of the Level 1 operator’s examination. There is a significant shortage of individuals with these qualifications in Wyoming at this time.

4. Legal Responsibilities

The operator is prohibited by state law from constructing, installing, or modifying a water distribution system unless the correct permit has been obtained, as described in Chapter 3 of the Water Quality Rules & Regulations as set forth by the Wyoming DEQ. The water system operator is directly and legally responsible for any
modifications to the system and can be fined $10,000 for an infraction of the aforementioned rule. Ultimately, the operator is responsible for the safety of water provided to individuals served by their water system and needs to be able to act reasonably autonomously of policy makers and financial controllers to assure safe operation of the system. As part of DEQ Chapter 12 regulations, the District must implement a backflow prevention policy. A sample policy is included in Appendix D for the District’s use.

B. ROLE OF BOARD AND ADMINISTRATION

1. Decision-Making Level

The Board and administration need to insure that accurate and up-to-date records are maintained to successfully manage the water system and keep it financially strong. This entails keeping mapping, as well as operation and maintenance data, up-to-date. The Board needs to work closely with the water system operator on critical issues. Since the operator is responsible for insuring safe operation of the system, he/she should be consulted with prior to any non-standard agreement being made with users or potential users.

2. Funding Requirements

Revenue for a water system can be generated through increased efficiency, minimization of losses, or by increasing user fees. It seems that consideration of increased user fees will be required to fund any upgrade to the District’s system. The Board and administration will need to perform an annual review of water rates and compare expenses against income. The public should be kept informed of the results of this comparison, even when rates don’t need to be raised. Rates should be raised 5% per year until income exceeds expenses. Consideration should be given to taking out a State Revolving Fund Loan for any improvements needed to the system that cannot be paid for from cash reserve, since construction costs have increased at over 20% per year for the last four years in Wyoming. Inflation has increased at approximately 3.4% per year during that same time frame and thus, the ability for users to pay for upgrades directly is diminishing.

The STWSD Board may, for the purpose of paying the expenses of conducting and managing the District’s water system, assess and collect a water fee of sufficient amount and in such manner as they deem most equitable from all premises supplied with water. The water rates, along with tapping fees, water meter charges, capacity fees, etc., are not included with the Regulations because they are subject to change periodically. Further discussion on this is included later in this report.
3. Assuring Public Safety

The safety of the public must be maintained at all times by the concerted efforts of the Board/administration. This can be best accomplished by setting rates at adequate levels to complete operation, maintenance, and upgrades, ensuring that the water system operator is spending adequate time monitoring the system, and by paying for regular operator training.

C. REGULATORY REQUIREMENTS

1. DEQ Regulations

Under current Department of Environmental Quality regulation, constructing, installing or modifying a water distribution system without a valid DEQ Permit-to-Construct is prohibited. In order to obtain a permit-to-construct, copies of plans, specifications, design data, or other pertinent data must be submitted to WDEQ. Plans, specifications, and the application for a permit-to-construct must bear the signature or seal of a registered professional engineer. The underlying objective of this is to insure that pipe sizes are correct, are constructed of the specified materials, are installed correctly, and that installation efforts are adequately documented. To insure that this is done correctly, construction must be completed under the direct supervision of a registered professional engineer.

2. EPA Regulations and Reporting

Drinking water suppliers must provide water quality reports (sometimes called consumer confidence reports) that tell where drinking water comes from, and what contaminants may be in it. Reports must be submitted to the EPA. The South Thermopolis Water & Sewer District facilitates monthly Bacteriological Tests, and testing for lead and copper is performed every third year with the next scheduled test year being 2009.

3. Design, Bidding Projects, and Construction

Design drawings, plans, specifications and estimates for public works of the state, or a political subdivision thereof, involving engineering or land surveying, shall be prepared by or under the personal direction of, and the construction of the works shall be executed under the direct supervision of, a qualified professional engineer within the category involved. Before advertising for a bid for any work on the construction of any public improvements, detailed plans and specifications shall be prepared, together with an estimate of the probable cost and a form of the proposed contract. Under state statutes, any contract for public improvements with an estimated cost over $20,000 (including design, construction, and materials) must be let to public bid.
Any person, firm, contractor or corporation desiring new water service shall make application in person or by agent for such service at the District Office. Each house or building shall have a separate and distinct curb stop located outside the premises, directly abutting such premises, and on public right-of-way. There shall be only one house or building on each meter.
A. ENVIRONMENTAL COMPLIANCE NEEDS

A Level II study will require completion of an Environmental Compliance Needs evaluation. Once the preferred alternatives are selected, correspondence identifying project scope and location of each will be sent to the various agencies requesting input. Information received will be compiled in the required report format. Mitigation techniques and associated costs will be prepared for identified issues. Often times, the response from various agencies is lengthy. This could delay the completion of this portion of the study, especially if an environmental impact is determined. Any additional field assessments identified as needed by the environmental review process should be planned for completion during the initial steps of the construction phase - Level III. This will be emphasized when distributing our documentation to ensure a quick response.

Various issues that are deemed to be pertinent to this project by the engineer, sponsor or WWDC will also be evaluated under this task. Specific issues on this project could include petroleum contamination of soils, wetlands issues, wildlife issues, and archaeological issues.

Several sources of federal funding are available to public entities to help mitigate costs associated with construction of a water-related project. These monies may also be used to fund portions of the construction that the WWDC cannot pay for, such as distribution and treatment. In order to secure federal funds, it is necessary to comply with the National Environmental Policy Act (NEPA).

The primary objective of this task is to provide adequate information for state and federal funding agencies to prepare environmental documents required under NEPA (42 U.S.C. 4321) for this project. This is done by preparing an "Environmental Report" (ER).

B. AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

The South Thermopolis Water & Sewer District is not currently pursuing capital funding that will require this section. This section is included in this report so that this information will be available in the future, if necessary.

1. Land Use/Important Farmland/Formally Classified Lands
   a) Affected Environment
      Areas affected by this project potentially include areas within the boundary of the South Thermopolis Water & Sewer District. Land use information relating to this project is included in Chapter 2. No information or
comments were received that indicate there is the potential to significantly impact these resources.

b) Environmental Consequences
The nature of this project is such that it will have minimum impact on farmland and formally classified lands. The pipelines will be buried in existing roadways and previously disturbed areas which will be reclaimed after project completion.

c) Mitigation
Normal restoration and reclamation activities associated with buried utility activities will mitigate the impacts on these areas.

2. Floodplains

a) Affected Environment
No facilities will be located in special flood hazard areas.

b) Environmental Consequences
None identified.

c) Mitigation
The proposed options will need to be reviewed by the Office of Homeland Security (Federal Emergency Management Agency – FEMA). Flood Insurance Rate Map information delineates Special Flood Hazard Areas within the South Thermopolis Water & Sewer District.

3. Wetlands

a) Affected Environment
No wetlands are included in the area identified for proposed facilities.

b) Environmental Consequences
None identified.

c) Mitigation
Not applicable.

4. Cultural Resources

a) Affected Environment
Clearance from the State Historical Preservation Officer (SHPO) is required before ground-disturbing activities occur. In order to receive SHPO clearance, a cultural resources survey of pipeline routes which are
located in relatively undisturbed rural areas must be made. No areas that fall in that classification are included in the project area.

b) Environmental Consequences
The response from SHPO indicates that most of the areas have not been surveyed for cultural resources and that a survey meeting the Secretary of Interior’s Standards for Archaeology and Historic Preservation should be conducted. A report detailing the results of the cultural resource survey will need to be prepared and submitted to SHPO.

c) Mitigation
If archaeological sites which are considered eligible for the National Register are located, two options are available:
- The site can be mitigated by archaeological excavation, or;
- The site can be avoided by re-routing the pipeline.

5. Biological Resources

a) Affected Environment
The project area is not located in an area that is anticipated to impact wildlife and fisheries. Comments from the United States Fish and Wildlife Service (USFWS) and Wyoming Game and Fish Department indicate that there is the potential for the project to impact biological resources.

b) Environmental Consequences
Potential concerns identified by commenting agencies due to the proposed option include impacts on threatened and endangered species. The USFWS identified bald eagles as a species that could be impacted by the project. Any impacts on migratory birds will also need to be mitigated.

c) Mitigation
A Threatened and Endangered Species Survey will need to be completed to fully identify species that may be impacted by the project.

6. Water Quality Issues

a) Affected Environment
There will be minimal potential for discharge of water to surface water during construction. The Water Quality Division of DEQ is responsible for reviewing project construction plans and specifications relating to water quality issues. DEQ approval and issuance of a Permit to Construct is required before construction can begin. The DEQ also requires an Engineer’s Design Report be prepared, documenting design calculations and assumptions. The DEQ will review the plans and specifications to confirm that DEQ design standards and regulations have been met. A
General Storm Water Permit for construction activities issued by the Wyoming Department of Environmental Quality is normally required for construction activities that disturb more than a 1-acre area.

b) Environmental Consequences
Additionally, the water generated during dewatering activities, pipeline testing, and disinfection activities have the potential to adversely affect waters of the state.

c) Mitigation
A general storm water permit should be obtained by the Contractor which requires the Contractor to detail how runoff from the construction site will be handled so as not to degrade the water quality of natural waterways on or adjacent to the construction site. The Contractor will have to discharge water used for hydrostatic pipeline testing and pipeline disinfection. The DEQ typically handles this type of discharge through a letter of permission to allow discharge. The Contractor will be responsible to apply for and obtain a DEQ letter of permission.

Obtaining and complying with these permits and any other project-specific permits that may be required will ensure that there are minimal impacts from completing the proposed work.

7. Socio-Economic/Environmental Justice Issues

a) Affected Environment
No major issues associated with socio-economic or environmental justice issues were identified in conjunction with the proposed options. The ability-to-pay of users is questionable as discussed in previous chapters.

b) Environmental Consequences
None Identified.

c) Mitigation
The District plans to investigate all alternatives for minimizing the costs passed on to customers.

8. Air Quality/Transportation/Noise Issues

a) Affected Environment
This project will have no long-term impacts on air quality, traffic flow, traffic volumes, or auditory senses. In the vicinity of the project, temporary impacts are anticipated relating to all issues as a result of construction activities.
b) Environmental Consequences
No long-term negative impacts are anticipated as a result of this work. Property owners in the vicinity of the project may be temporarily impacted by these issues.

c) Mitigation
Impacts on air quality will be limited by applying water to the project area during activities creating significant dust. Impacts of increased traffic flows and volumes will be limited by posting signs and using appropriate traffic control devices as identified in the Manual on Traffic Control Devices Work Zone Traffic Control Procedures Manual. Noise impacts will be limited by identifying the work hours that the contractor is allowed to work in the specifications for the project.

9. Additional Permitting and Access Issues

a) Mining Permit
The Land Quality Division of DEQ is responsible for administering the permit process for mining operations. The Contractor will require a material source for granular pipe bedding, riprap, and other aggregates. The Contractor will be assigned the responsibility to locate, secure, and obtain permits for borrow areas as required. The Contractor may elect to purchase these materials from a local supplier and avoid the need for this permit.

b) Burning Permit
Permits will be required from the Air Quality Division of DEQ to burn selected construction debris and materials cleared from the right-of-way if the Contractor chooses to dispose of these materials by burning. The Contractor should obtain this permit.

c) Easements
Construction of some of the proposed pipelines will require permission to occupy existing easements or rights-of-way from the Wyoming Department of Transportation and Hot Springs County. Easements from individual landowners will also be necessary in some instances. Access and utility easements across some lands will be needed when road permits are not granted, or where pipe alignments, pumping stations, storage tanks, or other appurtenances must deviate from established roads.

C. AGREEMENTS

Agreements will be necessary for constructing any of the proposed pipeline and tank options identified. These include agreements with each agency involved in providing
grants and/or loans to the users group. These again will cover all conditions and terms associated with the relationship with each funding agency. As outlined previously, other agreements between property owners and the District may be necessary for access and utility easements.

D. PERMITTING SUMMARY

As indicated previously, many permits, licenses, and rights-of-way will be required to construct the water improvements. Some of the permits are required to comply with environmental regulations, as identified. Permitting will constitute a significant effort in time and money.

Most of these permits should be secured by the District and the Engineer prior to bidding the projects due to the complexity and long lead time necessary. Other permits which are specific to a Contractor’s operation and method of construction are usually obtained by the Contractor. The following table summarizes the permits which may be required to address the environmental issues, as discussed previously. The table also indicates the party responsible for obtaining the permit.

<table>
<thead>
<tr>
<th>Section No.</th>
<th>Permit</th>
<th>Obtained By District and/or Engineer</th>
<th>Obtained By Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Archaeology &amp; SHPO Clearance</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Permit To Construct</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>General Storm Water Permit</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Testing Water Discharge Permit</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>9.a)</td>
<td>Mining Permit</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>9.b)</td>
<td>Burning Permit</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

E. SUMMARY OF MITIGATION

Two significant issues will need to be mitigated in conjunction with this project during preliminary design and routing. These include completing the following:

- Threatened and Endangered Species Survey
- Cultural Resource Survey
The Threatened and Endangered Species Survey will need to be completed to fully identify species that may be impacted by the project. Facilities may need to be relocated to avoid significant impacts on critical species.

The Cultural Resource Survey will evaluate the potential that a project will impact culturally significant facilities. Any archaeological sites that are identified, which are considered eligible for the National Register, will require either:

- The site to be mitigated by archaeological excavation, or;
- The site to be avoided by re-routing the pipeline.
CHAPTER NINE
CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

The South Thermopolis Water & Sewer District Water System does not appear to have any major issues with water quality. Although there are several dead-end pipelines located within the District, most of the usage rates and flushing operations are sufficient to prevent stagnation of water in the pipelines. Analysis of personal income levels of those living in the District and evaluation of the cost of potential improvements suggests that it will be very difficult for the District to implement a significant upgrade program from a financial standpoint. Efforts were made to evaluate innovative alternatives to improve operation of the water system and maintain good water quality. Four improvement alternatives were identified in this study, one of which should be implemented over the next decade. The most critical improvement that must be made to the system appears to be the relocation of the tank. In order to properly serve the existing water users and maintain a compliant system, the tank needs to be placed at a higher elevation. This will improve fire flows, eliminate the existing booster pump station, and increase the water pressure in those areas that are currently lacking.

B. CONCLUSIONS

The small population of the District, combined with the low average household income, limit the funding available to make improvements to the water system that will improve fire flow, system pressures, and eliminate some existing maintenance problems. There are a few distinct improvements that the District can implement that will improve water quality in areas of the District with the worst potential for quality issues. Water quality within the District is being negatively impacted by the dead-end pipelines located throughout the system. While changing the source of supply from surface water to groundwater may reduce or eliminate some existing water quality issues, it will likely have minimal positive impact on overall water quality since the alternative sources identified in this study present additional quality problems.

While the District water system is not configured in a manner that facilitates providing fire flows established by the International Fire Code to all serviced areas, the rural nature of the community does provide the District some flexibility in timing on installing additional water transmission lines and relocating the storage tank to a higher elevation. However, the new business park and assisted-living facility that are currently in the planning stages could require additional fire flows in the near future. More importantly, the low-pressure areas we identified in the system and the failing booster pump station are serious issues that need to be addressed. The District should begin planning for system upgrades that will remedy these problems.
C. RECOMMENDATIONS

At a minimum, the District should continue its current flushing program to minimize stagnation problems. They should flush their entire water system at least twice per year. This activity will also give the District an opportunity to exercise the hydrants and valves, which will be helpful for identifying items that need to be replaced.

The District should also take immediate steps to become part of the One Call of Wyoming system. This will help protect the District’s water and sewer systems from being damaged during excavation efforts in the area. Due to the broad expanse of the District and the presence of numerous other utilities, having an opportunity to locate the District’s pipelines and other components prior to excavation will be very valuable.

One of the most crucial recommendations for the District is to eliminate the existing booster pump station in the next 5-10 years. This part of the water system is very problematic and will continue to deteriorate at an ever-increasing pace. Replacing this pump station to provide the same level of service is NOT recommended, so the District should plan to move their storage tank to a higher location to provide adequate pressure to the Sable Run area.

As the District works to streamline its operations, it should approve and implement updated standards for water and sewer system components. These standards should meet Wyoming DEQ requirements and be similar to those used by the Town of Thermopolis, which will help with the continuity of the systems and minimize the number of separate fittings, meters, etc. that must be kept in the District’s inventory.

The District should implement a program for updating its system mapping on an annual basis. As new services are installed and old ones are found or abandoned, they should be recorded by the District’s field personnel and compiled into a working document that can be used to update the electronic files on a regular basis. The District should also consider tracking the installation and location of any new or replacement valves, hydrants, piping, repair clamps, etc. that are installed in the system. Keeping track of this information will be very helpful to the District as it continues to improve its operation and maintenance procedures.

D. PREFERRED ALTERNATIVES

The STWSD should consider applying for a Level II Study with the WWDC to further investigate its options for improving its water system. The Level II Study would consist of more comprehensive investigations into the recommendations of this current study, and provide cost estimates for the preferred alternatives in greater detail. If the Level II Study identifies issues with one or more of the preferred alternatives, acceptable solutions and modifications may be researched and presented to the District. Following the Level II Study, the District will likely be in a good position to apply for Level III funding to begin the design and construction of its selected system improvements.
Legend
- Lane 7 Tank 4846 ft
- Proposed TW Pipe
- Existing TW Pipe
- District Boundary

Service Area Pressure Zones
- Buffalo Creek 35-145psi
- Thermopolis Tank 35-80psi
- Upper Schmidt Tank 35-200psi

South Thermopolis Water & Sewer District
Option 4 Service Area
Plan Sheet A.7
NOTE:

NODE NUMBERING:
1000's = EXISTING TRANSMISSION PIPES
2000's = EXISTING DISTRIBUTION PIPES
3000's = PROPOSED TRANSMISSION PIPES
NOTE:

NODE NUMBERING:
1000's = EXISTING TRANSMISSION PIPES
2000's = EXISTING DISTRIBUTION PIPES
3000's = PROPOSED TRANSMISSION PIPES
NOTE:

NODE NUMBERING:
1000's = EXISTING TRANSMISSION PIPES
2000's = EXISTING DISTRIBUTION PIPES
3000's = PROPOSED TRANSMISSION PIPES
APPENDIX B

SOUTH THERMOPOLIS WATER & SEWER DISTRICT

PROPOSED ZONING

SEPTEMBER, 2007
The following is an excerpt from the official Town Code for the Town of Thermopolis. The South Thermopolis Water & Sewer District should work to implement land use zones, within the District boundary, that are similar and compatible to the Town’s. This will help to ensure continuity with the Town of Thermopolis and promote organized development and growth of the commercial areas.

TOWN OF THERMOPOLIS – TOWN CODE
CHAPTER 15.
ZONING

Article I. In General.


§ 15-102. Relationship to other laws.

§ 15-103. Severability.

§ 15-104. Burden of proof.

§ 15-105. Amendments.

§ 15-106. Definitions.

§ 15-107. Table I -- Illustration of Lot Terms.
(Table II has been deleted from this Code)

Article II. Districts.

§ 15-201. Establishment -- Official map; boundaries.

§ 15-202. Low Density Residential District (LDR)

§ 15-203. Medium Density Residential District (MDR).

§ 15-204. General Residential District (GR).

§ 15-205. Redevelopment District (RDV).

§ 15-206. Central Business District (CBD)

§ 15-207. Highway Business District (HBD)

§ 15-208. Industrial District (I).
§ 15-209. Agricultural District (A).

40. As to municipal planning and zoning authority see Articles 5 and 6 of Chapter 1, Title 15 of the Wyoming Statutes


§ 15-211. Residential Estate District (RE) -- Table III.

§ 15-212. State Park District (SP).

§ 15-213. Table IV -- Residential Zoning Districts.

ARTICLE I. IN GENERAL.

Sec. 15-101. Scope of Chapter.

No building or structure shall be erected, constructed, reconstructed, repaired, structurally altered, or moved, and no building, structure, or land shall be used or occupied except in compliance with the standards set forth in this Chapter. (Ord. No. 571, 2/21/80)

Sec. 15-102. Relationship to other laws.

If State or Federal law or regulations or Town Ordinances impose additional or duplicative standards on developments regulated by this Chapter, the more restrictive standard shall be met by the development. (Ord. No. 571, 2/21/80, 1-2)

Sec. 15-103. Severability.

If any portion of this Chapter or its application to specific circumstances shall be held invalid by a court of competent jurisdiction, the remainder of the Chapter and its application to other circumstances shall be unaffected. (Ord. No. 571, 2/21/80, 1-3)

Sec. 15-104. Burden of proof.

The burden of proof shall, in all proceedings pursuant to this Chapter, rest with the developer, applicant, or appellant. (Ord. No. 571, 2/21/80, 1-4)

Sec. 15-105. Amendments.

(a) Amendments to this Chapter shall be made as specified in Wyo. Stat. §15-1-603. Amendments may be made at any time by the Governing Body by ordinance on its own motion, upon recommendation from the Planning Commission, or upon signed petition of any interested person or persons. All proposed amendments shall be referred to the Planning Commission for study and recommendation.
(b) The zoning of new additions is an amendment to the official zoning district map and the public hearing on this kind of amendment will normally be combined with the public hearing required for subdivision, if applicable. Petitions for annexation shall be accompanied by a written request for a zoning designation for the proposed addition.

(c) Zone changes must have approval of a three-fourths majority of the Town Council if the owners of 20% or more of the property included within the proposed change or within 140 feet of its boundaries (excluding the width of streets or alleys) sign a protest. (Ord. No. 598, 9/20/82, 8)

Sec. 15-106. Definitions.

For the purposes of this Chapter, the following words or phrases shall have the meaning respectively ascribed to them herein. Certain specialized definitions will be found in the Sections relating to their application. Words used in the singular include the plural and the plural, singular. Words used in the masculine gender include the feminine and the feminine, masculine. Where words or phrases are not defined, they shall have their ordinary accepted meanings within the context with which they are used.

(a) **Accessory buildings and/or uses** -- a subordinate use, building, structure that:

(i) Is clearly incidental to the use of the principal building, structure or land use.

(ii) Is customary in connection with the principal building, structure or land use.

(iii) Is ordinarily located on the same lot as the principal building, structure or land use.

(iv) May include, but is not limited to the following:

1. Private kennels and dog houses.
2. Signs permitted by Article VII.
3. Off-street parking and loading areas as required by Article VI.
4. Fences as permitted by Article XI.
5. Private greenhouses.
6. Private swimming pools.
7. Storage of merchandise in commercial and industrial districts.
8. Fallout shelters.
9. Cultivation, storage and sale of crops, vegetables, plants, and flowers produced on the premises.
10. For an industrial or commercial use, one dwelling unit for occupancy by the owner or a manager or watchperson.
(11) Antenna for television or radio reception.
(12) Private garages and storage sheds for household items or lawn and garden tools.

(b) Adequate -- Many planning considerations involve case-by-case analysis of proposed developments which identifies unique opportunities for, and limitations on, particular developments. A realistic planning program cannot anticipate all of these individual opportunities or limitations and must retain a great deal of flexibility for dealing with them. Use of the term "adequate" recognizes this fact and is intended to allow the Town to deal with the many functional, service, environmental, and aesthetic aspects of developments that can be anticipated only by general policy statements or performance standards.

(c) Apartment house/complex -- A structure or structures consisting of three or more independent, rental dwelling units. Regulated as a "high density residential use."

(d) Board -- The Town's duly appointed Board of Adjustment.41

(e) Building -- Any structure used or intended for supporting or sheltering any use or occupancy. (See structure).

(f) Building height -- Measured to the point of the roof line as provided by the UBC; antenna, roof belvederes, monitors, chimneys, and vents may extend beyond the roof line. (Ord. No. 598, 9/28/82, 3)

(g) Building Official -- The officer or other designated authority charged with the administration or enforcement of the Ordinance or a duly authorized representative.

(h) Building permit -- A permit issued by the Building Official and intended to assure compliance with the Town's building codes and, for use-by-right, with this Chapter.

(i) Certificate of occupancy -- A certificate issued by the Building Official upon completion of a development's construction or reconstruction or upon a change in occupancy or use certifying that the development or change complies with this Chapter and other applicable Ordinances. The development or new occupancy may not be occupied or operated prior to the issuance of a certificate of occupancy.

41. As to authority of municipalities to appoint a board of adjustment, see Wyo. Stat. §15-1-605.

(j) Commission -- The Town's duly appointed Planning and Zoning Commission.42
(k) **Conditional use permit** -- A permit granted by the Town Planning Commission for a use not allowed as a right in a district and specifically described as an allowable conditional use in the district. Such permit is to be granted in accordance with the conditional use review process.

(l) **Condominium** -- A structure or structures consisting of independent dwelling units offered for sale. Time sharing or later rental does not affect this definition. It is a subdivision.

(m) **Council** -- The Town's duly elected Governing Body.

(n) **Density** -- The number of dwelling units per acre calculated by dividing the acreage of a parcel, excluding the area of streets, by the number of dwelling units.

(o) **Development** -- A general term referring to any proposed use, occupancy, building, or structure regulated by this Chapter.

(p) **District** -- A zoning district established in this Chapter. For certain purposes, general terms may be used to refer to several similar districts. The term "residential" refers to the RE, LDR, MDR, GR, and RVD districts. The terms "commercial" refers to the HBD and CBD districts.

(q) **Dwelling, Single-Family** -- See "Single-Family Dwelling."

(r) **Dwelling, Two-Family** -- See "Two-Family Dwelling."

(s) **Dwelling, Multiple** -- See "Apartment House."

(t) **Dwelling Unit** -- Any building or portion thereof which contains living facilities, including provisions for sleeping, eating, cooking and sanitation as required by the adopted Town Building Code for not more than one family.

(u) **Duplex** -- See "Two-Family Dwelling."

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42. As to authority of municipalities to appoint a planning and zoning commission, see Wyo. Stat. §§15-1-502 and 15-1-604.

(v) **Family** -- An individual or two or more persons related by blood or marriage or a group of not more than five persons (excluding servants) who need not be related by blood or marriage living together in a dwelling unit.

(w) **Floor area** -- The area included within the surrounding exterior walls of a building or portion thereof, exclusive of vents, shafts and courts. The floor area of a building or portion thereof, not provided with surrounding exterior walls shall be usable area
under the horizontal projection of the roof or floor above.

(x) **Floor area ratio** -- The ratio of the floor area of a building, including all levels or stories, to its total site, computed by dividing the floor area of said building including accessory buildings within the area of the building site, by the site area.

(y) **High density residential use** -- Apartment houses or complexes, townhouses or row houses, and condominiums.

(z) **Home occupations** -- Defined by the Home Occupation Performance Standards.

(aa) **Impervious cover** -- Includes all rooftops, sidewalks, driveways, and other on-site improvements that are incapable of being penetrated by rainfall, snowmelt, or drainage. (Ord No. 598, 9/20/82, 4)

(bb) **Industry** -- Industrial uses include the processing of agricultural, timber, or minerals commodities or products and the production, fabrication or assemble of manufactured items.

(cc) **Institutions** -- Includes churches, private schools, museums and galleries, and similar uses. It does not include primary health care facilities.

(dd) **Light manufacturing** -- The production, fabrication, or assembly of commodities or items in a usually controlled operation which is relatively clean, quiet, and free of objectionable nuisances such as dust, noise, or smoke. Little industrial traffic is usually generated.

(ee) **Lot** -- A lot is a parcel of land of sufficient size to meet minimum zoning requirements for use, coverage, and area, and to provide such yards and other open spaces as required. (Ord. No. 598, 9/20/82, 5)

(ff) **Lot area** -- The square footage of a lot.

(gg) **Lot coverage** -- The ground level coverage of a building or structure and of all impervious surfaces, such as sidewalks or driveways, measured by their gross outside dimensions at ground level.

(hh) **Lot width** -- The distance between side lot lines, measured along the setback line as established by this ordinance, or if no setback line is established, the distance between the side lot lines measured along the street line.

(ii) **Mobile home** -- A factory assembled movable dwelling over 45 (forty-five) feet in length and 8 (eight) feet in width, designed and constructed to be towed on, and permanently supported from, its own chassis. They may include 1 (one) or more components which can be retracted for towing and subsequently expanded for additional
floor area, or 2 (two) or more units separately towable but designed to be joined into 1 (one) single unit. Every section shall bear a label certifying that it is built in compliance with the Federal Manufactured Home Construction and Safety Standards. For mobile homes built prior to June 15, 1976, a label certifying compliance to Standard for Mobile Homes, NFPA 501, ANSI 119.1, in effect at the time of manufacture shall be attached. Mobile homes may also be referred to as "Manufactured Home". (Ord. No. 693, 1/29/93, 2)

(jj) Mobile home park -- A parcel, or contiguous parcel, of land under one ownership which has been improved so that it contains two or more mobile home lots for residential use. Normally, the lots or spaces are rented, which distinguishes the "mobile home park" from the "mobile home subdivision." Rental is not, however, necessary to the application of this definition and of regulations subsequent to it.

(kk) Mobile home subdivision -- A parcel of land subdivided pursuant to the Town's subdivision regulations, principally designed and with the requisite improvements for occupancy by mobile homes on lots.

(ll) Modular home -- Any prefabricated, factory built structure of conventional construction which conforms to all provisions of the UBC, is designed and built on an off-site location, transported to a site on a separate trailer, placed on a permanent foundation, and attached to such foundation. This definition does not include double wide mobile homes. Modular homes are to be considered single-family dwellings under the provisions of this Chapter.

(mm) Neighborhood convenience business -- An establishment selling basic grocery or sundry items or oriented to the service of a particular neighborhood of the Town. It is not automobile oriented and does not sell gasoline. It does meet compatibility performance standards for residential districts.

(nn) Nonconforming use -- Defined in Article IV of this Chapter regulating such uses.

(oo) Nursing home -- A residential care facility for the elderly, infirm or disabled. Not primarily a mental health care facility or a hospital.

(pp) Occupancy -- A general term referring to the particular use of a building, structure, or lot. Occupancy may be changed (a shoe store changing to sporting goods) without structural changes. Changes in occupancy are regulated by this Chapter.

(qq) Permanent foundation -- A masonry, concrete or other substructure meeting the requirements of the adopted building code of the Town.

(rr) Public recreational facilities -- Includes non-fee facilities operated by the public, such as neighborhood parks or ball diamonds.

(ss) Quasi-public uses -- Includes utility substations and other public facilities or
installation necessary to serve the neighborhood or area where they are located, and
recreational facilities.

(tt) Rooming house -- An establishment offering rooms and meals for rent on a
weekly or monthly basis, customarily housed in a large single family dwelling. Not a motel
or hotel.

(uu) Row house -- See "Townhouse."

(vv) Site plan -- A scale drawing showing the location of property lines and
proposed improvements as required by this Chapter.

(ww) Single family dwelling -- A detached structure designed and intended for
occupancy by a family. This term does not include the use of mobile homes on lots except
in the MDR, GR and RVD zones.

(xx) Solar collector -- One of the following which is capable of collecting, storing,
or transmitting at least 25,000 BTU's of solar energy on a clear winter solstice day:

(i) A wall, clearstory or skylight window designed to transmit solar energy into
a structure for heating purposes;

(ii) A greenhouse attached to another structure and designed to provide part
of the heating for the structure to which it is attached;

(iii) A Trombe wall, "drum wall" or other wall or roof structural element
designed to collect and transmit solar energy into a structure;

(iv) A photovoltaic collector designed to convert solar energy into electric
energy;

(v) A plate type collector designed to use solar energy to heat air, water, or
other fluids to use in hot water or space heating or for other applications; or

(vi) A massive structural element designed to collect solar energy and
transmit it to internal spaces for heating. (Ord. No. 598, 9/20/82, 7)

(yy) Solar right -- A property right to an unobstructed line-of-sight path from a solar
collector to the sun which permits radiation from the sun to fall directly on the collector.
The extent of the solar right shall be described by the path of the sun on the winter solstice
day which is put to beneficial use or is otherwise limited by this Chapter or State law.

(zz) Structure -- A structure is that which is built or constructed, an edifice or
building of any kind, or any piece of work artificially built up or composed of parts joined
together in some definite manner.
(aaa) **Subdivision** -- As defined in Section 13-110 (k) herein. Includes condominiums and townhouses.

(bbb) **Supply yards** -- A commercial establishment storing and offering for sale building supplies, steel supplies, pipeline supplies, coal, heavy equipment, feed and grain, and similar goods.

(ccc) **Town** -- The Town of Thermopolis, Wyoming.

(ddd) **Townhouse** -- An attached series of independent dwelling units offered for sale. Is a subdivision and "high density residential use." "Row house" is synonymous.

(eee) **Two family dwelling** -- A detached structure designed for essentially independent occupancy by two single nuclear or extended family or other living groups. Synonymous with "duplex."

(fff) **Use** -- A general term referring to existing or proposed land uses, buildings, or structures.

(ggg) **Use-by-right** -- A use permitted pursuant to a building permit and certificate of occupancy, both issued by the Building Official. Standards for uses-by-right are established for each district in Article II of this Chapter.

(hhh) **Variance** -- A special legal device described in Wyo. Stat. 15-1-608 by which the strict application of the various standards of this Chapter may be suspended on a particular parcel of land. (Ord. No. 571, 2/21/80, Chapter 2)

(iii) **Yard** -- An open, unoccupied space, other than a court, unobstructed from the ground to the sky, on the lot which a building is situated. (See Table I, Sec. 15-7)

(ii) **Yard front** -- A yard extending from the front lot line adjoining a public street to the front of the building between side lot lines.

(kkk) **Yard rear** -- A yard extending from the rear of the building between the side lot lines to the rear lot line. (Ord. No. 674, 7/12/90, 2)

(III) **Yard side** -- A yard extending from the rear line of the required front yard to the front line of the required rear yard between the building and the side lot line. (Ord. No. 674, 7/12/90, 2)

(mmm) **Group home** -- Group Home shall be defined as a facility operated by nonprofit community health and welfare service organizations for residential and "family-line" purposes (not to exceed eight (8) residents and two (2) staff). (Ord. No. 679, 9/28/90, 7)

(nnn) **Recreational Vehicle** -- A camping trailer, travel trailer, motor home and truck
camper as each are herein defined, and are sometimes herein referred to as Recreational Vehicle:

A. **Camping Trailer** -- A vehicular portable unit mounted on wheels and constructed with collapsible partial side walls that fold for towing by another vehicle and unfold at the campsite to provide living quarters for recreational, camping or travel use not exceeding 45 feet in body length.

B. **Travel Trailer** -- A vehicular unit, mounted on wheels, designed to provide living quarters for recreational, camping or travel use, that does not exceed 45 feet in body length.

C. **Motor Home** -- A vehicular unit designed to provide living quarters for recreation, camping or travel use built on or permanently attached to a self-propelled motor vehicle chassis or on a chassis cab or van that is an integral part of the complete vehicle that does not exceed 45 feet in body length.

D. **Truck Camper** -- A portable unit constructed to provide living quarters for recreational travel or camping use consisting of a roof, floor and sides designed to be loaded onto and unloaded from the bed of a truck type vehicle with the total unit length not exceeding 45 feet. (Ord. No. 693, 1/29/93, 1)

(ooo) **Permanent Dwelling or Permanent Place of Business** -- Any unit used as dwelling or business occupancy over 5 (five) days in any one month or over 30 (thirty) days in any one calendar year. (Ord. No. 693, 1/29/93, 4)

(ppp) **Gaming Establishment** -- Any structure, building, room, enclosure, vehicle, vessel, location or other place, whether open or enclosed and containing one or more gaming device(s) used or intended to be used for gaming.

(qqq) **Gaming** -- Risking any property for gain contingent in whole or in part upon lot, chance, the operation of a gaming device or the happening or outcome of an event, including a sporting event, over which the person taking the risk has no control. (Ord. No. 707, 11/1/94, 1)

(rrr) **Gaming Device** -- Any device, table, machine, paraphernalia or equipment used in the act of gaming. (Ord. No. 707, 11/1/94, 1)

(sss) **Gaming Assessment Certificate** -- A current, properly issued certificate signed by the Town Clerk and containing the number of gaming devices allowed by the certificate and documenting the location of the gaming establishment by address and lot, block and subdivision. (Ord. No. 707, 11/1/94, 1)

(ttt) **Carport** -- A roofed structure entirely open on two or more sides, used for the storage of private or pleasure-type vehicles and is usually formed by extension of the roof from the side of another building or may be a free-standing accessory building, not
attached to another building, and except for structural supports entirely open on two or more sides. (Ord. No. 710, 9/3/95, 1)

(uuu) Manufactured Portable Carport -- A detached factory manufactured accessory building customarily used as a carport. The manufactured portable carport can be moved without disassembly, after removal of tie-down provisions intended to compensate for wind displacement, no more than 12 feet in height at any point nor providing more than 250 square feet of projected roof area and except for structural supports, entirely open on two or more sides. (Ord. No. 710, 9/3/95, 1)

(vvv) Private Garage -- An accessory building or a portion of a building in which only private or pleasure-type motor vehicles used by the tenants of the building or buildings on the premises are stored or kept. (Ord. No. 710, 9/3/95, 1)

-www- Bed-and-Breakfast Facility -- A private home which is used to provide temporary accommodations for a charge to the public with not more than four (4) lodging units or more than a daily average of eight (8) persons per night during any thirty (30) day period and in which no more than two (2) family style meals are provided per twenty four (24) hour period. (Ord. No. 704, 6/21/94, 1)

(xxx) Bed-and-Breakfast Inn -- A home atmosphere which is used to provide limited lodging, temporary overnight accommodations for paying guests for five (5) or more lodging units, or more than eight (8) persons per night during any thirty (30) day period, and in which meals are served to lodging guests. A Bed-and-Breakfast Inn is a land use, with the optional provision of residential use by the owner/operator, and shall only be allowed within a designated Business District. A Bed-and-Breakfast Inn is distinguished from a hotel or motel operation by its size and more personal atmosphere with limited services. (Ord. No. 704, 6/21/94, 1)

(yyy) Lodging Unit -- A room with one (1) or more beds, bunks or other facilities for sleeping purposes for an unspecified number of persons. (Ord. No. 704, 6/21/94, 1)

(zzz) Temporary Accommodations -- Limited time accommodations intended for travelers or those on vacation and shall not exceed thirty (30) consecutive nights in duration. (Ord. No. 704, 6/21/94, 1)

ARTICLE II. DISTRICTS.

Sec. 15-201. Establishment -- official map; boundaries.43

(a) The boundaries of the districts established are shown on the map entitled "Zoning District Map of the Town of Thermopolis, Wyoming" dated July 29, 1986, which map and all information shown thereon are by this reference made a part hereof. (Ord. No. 638, 8/5/86, 1)
43. Some districts have been established for possible future use and are not currently mapped. Each district has a distinct planning purpose which is described in the following sections. In each zone there may be uses-by-right and standards for them and conditional uses. The review of uses-by-right is conducted by the Building Official, that of conditional uses by the Commission. The differing review procedures are set forth in the procedural Article of this Chapter.

(b) The Town may be divided into the following zoning districts, the boundaries and extent of which shall be shown on an official zoning map identified by the signature of the mayor, attested by the Town Clerk, and bearing the seal of the Town.

(a) Residential Estate District (RE)
(b) Low Density Residential District (LDR)
(c) Medium Density Residential District (MDR)
(d) General Residential District (GR)
(e) Redevelopment District (RDV)
(f) Central Business District (CBD)
(g) Highway Business District (HBD)
(h) Industrial District (I)
(i) Agricultural District (A)
(j) Open Space District (O)
(k) State Park District (SP)

(c) Unless otherwise defined on the zoning district map, district boundaries are platted lot lines; the centerlines of streets, alleys, or railroad rights-of-way (or such lines extended); government survey lines; municipal limits lines, or the centerlines of streams. If a lot is divided by a district boundary, the less restrictive zoning requirements may be extended not more than 25 feet into the more restrictive district. (Ord. No. 624, 3/5/85, 1, 3)

(d) There is hereby established the Municipal District, which shall be designated on appropriate maps as "M". The municipal district provides locations within the Town from which municipal services may be generated and from which may be conducted and/or extended to the Town residents by the governing body. Except as hereinafter provided, because all the lands within the "M" District are owned by or under the control of the governing body, all uses shall be authorized by the Mayor and Council, and all authorized uses shall be considered uses by right and are not required to meet any other provisions or performance standards of the Zoning Ordinances. Those lands excepted from the exclusive and ownership and control of the Town of Thermopolis are those presently owned by C.B. Ingle and Lee Ola Ingle and described in Ordinance No. 649. (Ord. No. 650, 5/10/88)

Sec. 15-202. Low Density Residential District (LDR)

(a) The LDR is established to protect stable neighborhoods of detached single family dwellings with relatively low land use intensities. The limited conditional uses allowed in this district shall be compatible with an atmosphere of large, landscaped lawns, low building heights, ample setbacks and sideyards, predominantly off-street parking, low traffic volumes, and low nuisance potentials. (Ord. No. 679, 9/28/90, 1)
(b) The uses-by-right allowed and standards for their development are shown in Table IV, Section 15-301. Uses-by-right are also subject to the parking, signage and riverfront area performance standards. (Ord. No. 571, 2/21/80, 3-2)

(c) Conditional uses permitted and standards for their development are shown in Table IV, Section 15-301, subject to approval of application pursuant to Section 15-504. Conditional uses shall be compatible with the district's description and subsection (a) above, including their accessory buildings or uses, parking, signage, riverfront area and other applicable standards and ordinances. 

Sec. 15-203. Medium Density Residential District (MDR)

(a) The MDR is established to protect stable neighborhoods of detached single family dwellings with smaller lots and some mixture of higher density residential uses. Restoration or development of older homes in this district shall be encouraged. Conditional uses shall be compatible with an atmosphere of low building heights, low traffic volumes, and low nuisance potentials but may be developed at higher intensities than in the LDR.

(b) The uses-by-right allowed and standards for their development are shown in Table IV, Section 15-301. Uses-by-right are also subject to the parking, signage and riverfront area performance standards. (Ord. No. 571, 2/21/80, 3-3)

(c) Conditional use permitted and standards for their development are shown in Table IV, Section 15-301, subject to approval of application pursuant to Section 15-504. Conditional uses shall be compatible with the district's description and subsection (a) above, including their accessory buildings or uses, parking, signage, riverfront area and other applicable standards and ordinances. (Ord. No. 679, 9/28/90, 2)

Sec. 15-204. General Residential District (GR)

(a) The GR is established to include transitional residential areas where conventional and mobile homes are mixed, along with higher density residential uses and some nonconforming businesses. Higher land use intensities, traffic volumes, and nuisance potentials may be allowed for conditional uses in this district but its character should remain clearly residential.

(b) The uses-by-right permitted and standards for their development are shown on Table IV, Section 15-301. Uses-by-right are subject to the parking, signage and riverfront area and other applicable standards and ordinances.

(c) Conditional use permitted and standards for their development are shown on Table IV, Section 15-301, subject to approval of application pursuant to Section 15-504. Conditional uses shall be compatible with the district's description and subsection (a) above, including their accessory buildings or uses, parking, signage, riverfront area and other applicable standards and ordinances. (Ord. No. 679, 9/28/90, 3)
Sec. 15-205. Redevelopment District (RDV).

This is a special purpose district that will be mapped to facilitate the public or private redevelopment of a blighted area where housing quality and values are continually deteriorating or to facilitate a planned unit development (PUD) of unimproved land. An urban renewal or housing authority could operate within this district. All developments shall be subject to review as part of a redevelopment plan for the entire district. The redevelopment plan may propose a wide range of land uses and land use intensities. Application of this zoning designation may involve the removal of substandard and inexpensive housing. Development shall replace this housing with adequate and affordable housing units. (Ord. No. 624, 3/5/85, 5)

Sec. 15-206. Central Business District (CBD).

(a) This district is intended to include the Town's principal retail and service center. On-street public parking and lot coverage approaching 100% is the rule. This is the area in which "downtown" beautification or improvement plans could operate. Restoration of second story commercial space in this district is encouraged. Industrial uses are not permitted in the CBD.

(b) Uses-by-right in the CBD include the reconstruction, repair or structural alteration of existing occupancies, and changes of use in existing structures, accessory buildings and use, and signs allowed in commercial districts by the signage performance standards. Standards for uses-by-right shall be those set forth in the signage, parking, and fencing performance standards of this Chapter and an overall floor area ratio limit of 3.

(c) Conditional uses in the CBD include all new principal structures or buildings. Conditional uses shall be compatible with the district's description in Subsection (a) above, including their accessory buildings or uses and signs. (Ord. No. 624, 3/5/85, 6)

Sec. 15-207. Highway Business District (HBD).

(a) The highway business district is established to provide for expansion of the Town's retail and commercial area. Highway oriented commercial uses usually require locations on major highways and include, but are not limited to, such activities as service stations, supply yards, auto sales and service, motels and restaurants, drive-in banks, and commercial recreation. The HBD is intended to assure that highway oriented commercial uses are planned and developed to enhance circulation, off street parking, and landscaped settings for structures are the rule. As the transition of areas mapped in this district from residential to commercial will be a gradual process, conditional uses are encouraged to mitigate potentially adverse impacts on neighboring residences. Light manufacturing may be permitted as conditional uses; other industrial uses will not be permitted.

(b) Uses-by-right shall include all construction, repair, or structural alteration of existing occupancies; changes of commercial or public use; new commercial uses fronting
U.S. Highway 20 and adjacent to the existing commercial uses, structures or buildings; accessory buildings and uses; residential uses incorporated as a part of a commercial use for the purpose of housing owners or employees of the commercial use; signs as permitted by Article VII of this Chapter. Standards for uses-by-right shall include the parking, riverfront, and fencing performance standards. The floor area ratio shall be limited to 3 and lot coverage 80% for all uses within this zone. (Ord. No. 624, 3/5/85, 7)

(c) Conditional uses shall include light manufacturing, quasi-public uses, mobile homes not fronting on Highway 20, other residential uses anywhere in the District, public recreation facilities, and institutions.

(d) When the district boundary of the HBD bisects a block and a developer proposes to use contiguous lots, of which only a portion is zoned HBD, the use proposed, whether retail, commercial, or one permitted in the neighboring zone, shall be a conditional use and subject to review by the Commission. (Ord. No. 631, 9/17/85, 1)

Sec. 15-208. Industrial District (I).

(a) The I district is established to segregate industrial uses which are generally major and extensive operations, require large level sites with open storage and service areas, will utilize regional transportation such as railway and state highways, and normally generate some nuisances such as glare, dust, smoke, noise, and water and air pollution. Light manufacturing, supply yards, and construction and storage facilities are also compatible in this district, although their nuisance potential is generally less and their demand for access and transportation may be less.

(b) Residential uses are not permitted in the I district. This segregation is to protect industrial uses and potential industrial sites from residential and commercial uses "moving to a nuisance" and thereby possibly limiting or inhabiting industrial operations or expansion.

(c) Uses-by-right shall include all reconstruction, repair or structural alteration or existing occupancies, accessory buildings or uses and signs, and change of industrial occupancy within a UBC occupancy group in existing structures.

(d) Conditional uses shall include all industrial uses not listed as uses-by-right in Subsection (c) above. (Ord. No. 598, 9/20/82, 13)

Sec. 15-209. Agricultural District (AG).

(a) This district is intended to anticipate expansion of the Town into agricultural areas and to preserve agricultural production in those areas.

(b) Uses-by-right in the AG district include all primary agricultural production activities and their accessory uses and buildings including farm homes and signs as allowed by the signage performance standards. Uses-by-right are subject to the riverfront

Appendix B 17
performance standards and to a lot coverage limitation of 5%.

(c) Conditional uses in the AG district include:

(i) Public and quasi-public recreational facilities.
(ii) Campgrounds and travel trailer courts.
(iii) Home occupations. (Ord No. 571, 2/21/80, 3-9)

Sec. 15-210. Open Space District (OS).

The OS district is intended to protect slopes and natural drainageways from development that would cause or contribute to slope failures, excessive soil erosion, and sediment pollution of the Big Horn River. It may also be mapped in floodplain areas and will be used as the zoning designation for some existing parks. Because of the sensitive nature of lands included in the OS district, all development including filling, grading and excavation will be regulated as conditional uses subject to the performance standards set forth in this Chapter. (Ord. No. 624, 3/5/85, 8)

Sec. 15-211. Residential Estate District (RE).

(a) The RE District is established to permit in the agricultural and scenic areas of the Town large estate lots which cannot be economically accommodated with the Town's central residential areas.

(b) Uses by Right -- Uses-by-right shall include those shown on Table IV, Section 15-301. Uses-by-right shall also be subject to parking, signage and riverfront area performance standards. Minimum lot size shall vary depending on the land use capability as determined in Subsection (d) below, but in no case shall the lot size be less than 12,000 square feet.

(c) Conditional Uses -- Conditional uses shall be compatible with the atmosphere as a Low Density Residential Estate type district. Conditional uses permitted and standards for their development are shown on Table IV, Section 15-301, subject to approval of application pursuant to Section 15-504. (Ord. No. 679, 9/28/90, 5)

(d) Carrying Capacity Determination.44

(i) Carrying capacity is defined in terms of three broad physical characteristics:

(1) Slope
(2) Erosion potential
(3) Stormwater runoff potential

(ii) Method of evaluating carrying capacity.48
(1) Step 1. Initial determinations.

(A) Determine average slope (see Table III) ________

(B) Determine soil series (from SCS mapping) ________

(C) Determine runoff potential (by hydrologic group) ________

(2) Step 2. Determine allowable impervious coverage from Table III ________

44. This Chapter imposes restrictions on the intensity or density of development for the RE District as one way of assuring that development is compatible with neighboring land uses and in harmony with its physical setting. The "bottom line" on density is the point at which increased density presents potential public health or safety hazards or potentially damaging impacts on the neighboring or downtown properties. (Ord. No. 624, 3/5/85, 43)

45. Coverage from Step 3 is divided by % allowable impervious coverage from Step 2. For example, 12,000 square feet from Step 2, divided by 40% impervious coverage from Step 3 equals 30,000 square feet minimum allowable lot size. (Ord. No. 624, 3/5/85, 43)

(3) Step 3. Coverage determination from plans or, in the case of rural subdivisions, assume 12,000 square feet per lot ________

(4) Step 4. Determination of density as a function of impervious coverage allowed ________

(iii) The formula in Subsection (ii) above for determining minimum lot size shall only apply to developments served by central sewer and water. All other developments shall require a minimum of one acre or more depending on the land area required for septic systems, well separation, runoff potential and slope.

(iv) Average slope of a development or lot is determined by review of USGS topographic maps and site inspection. Land dedicated to the public for parks or open space can be discounted in the calculation.
APPENDIX C

WATER SYSTEM OPERATING PLAN

SOUTH THERMOPOLIS WATER & SEWER DISTRICT
MASTER PLAN LEVEL I STUDY

OPERATOR RESPONSIBILITIES

1. All operators in direct responsible charge of a public water supply system, including the distribution system, must be certified by Wyoming DEQ to operate the system. A certified operator must be available at all times to make program control decisions that could affect the quality or quantity of water being distributed.

2. The water system operator for the South Thermopolis Water & Sewer District (STW&SD) shall ensure that a free chlorine residual in all parts of the distribution system in the amount of not less than 0.2 mg/L is maintained. Public Water Systems using surface water shall continuously chlorinate and maintain a free chlorine residual of 0.2 mg/L in all parts of the distribution system.

3. All community water systems (CWS) must adopt an ordinance or policy and plan. After the adoption of the plan, each community water system must establish an ongoing program for the detection and elimination of hazards associated with cross-connections. Records of the cross-connection control program must be maintained by the water supplier and shall include such items as date of inspection, person contacted, recommendations, follow-up, and testing results.

4. Operator shall see that newly constructed or repaired distribution lines, finished water storage facilities and filters shall be flushed and disinfected before use in accordance with methods contained in American Water Works Association (AWWA) Standard C651-92, C652-92, and C653-97 or the latest revision. Bacteriological results indicating adequacy of disinfection procedure on tanks, mains and repairs must be maintained on file for five years.

5. No new construction shall be done, nor shall any change be made to any public water system, until the engineering plans prepared by a registered Professional Engineer for the new construction or change have been submitted and approved by the Wyoming DEQ. The plans must be approved prior to beginning work.

6. All vents on wells, springs, storage tanks, overflows and clear wells shall be properly screened. All overflows on springs and tanks shall be screened and protected.
7. All buildings and equipment used in and for the production and distribution of water (to include chemical and other storage buildings) must be well maintained and be reliable and fit for the purpose for which they are used.

8. All pipe, solder, or flux, which is used in the installation or repair of any public water system, shall be lead free. This shall not apply to lead joints necessary for the repair of cast iron pipes. The term “lead free” in this section is defined as follows:

(a) When used with respect to solders and flux shall mean solder and flux containing not more than two-tenths of one percent (0.2%) lead and

(b) When used with respect to pipes and pipe fittings shall mean pipes and pipe fittings containing not more than eight percent (8.0%) lead.

9. All public water systems using surface water shall provide disinfection to control the biological quality of the water. Due consideration shall be given to the contact time of the disinfectant in the water with relation to pH, ammonia, taste producing substances, temperature, presence and type of pathogens, and trihalomethane formation potential. The disinfectant will be applied in the manner needed to provide contact time to kill or inactivate any disease-causing organisms present.

10. Operator shall endeavor to minimize leaks within the system by instituting a leak detection survey.

(a) A leak detection survey begins with maps of the distribution system. These maps should show all information pertinent to the distribution system such as, but not limited to: water sources, treatments plants, mains, line sizes, valves, service lines, curb stops, and hydrants. Also, be sure to keep maps that show previously repaired leaks and locations of customer complaints. These may help in the location of future leaks.

(b) Some parts of a water system leak more than others. At the beginning of any leak detection work, perform a preliminary survey. Look for signs of leaks and check the most common places for leaks to occur. Locations where leaks may be found by visual inspection:

- storage tank overflows
- stuck air relief valves
- excessive leaks due to old or worn pump packing
- new or recently repaired lines
- cracked meter bottoms

During inspection, also look for illegal taps or connections. For example, check fire hydrants on private property for illegal hose attachments.
(c) Leaks may also occur that cannot be found by visual inspection. One of the most common sources of leaks is fire hydrants. Valve seats can be damaged or improperly seated. Water can leak past these and out through drain holes inside the hydrant barrel. If the hydrant is a dry barrel type, it may be possible to listen for internal water leaks.

(d) If the aforementioned leak detection procedures fail to locate the source of the leak, the distribution system can be broken into zones to help isolate leaks. This will help determine how much water is being lost in each section of your system. Once water loss in each zone is determined, it will be easier to pinpoint leaks with leak detection equipment such as geophones, leak detectors, or leak correlators.

11. Operator is responsible for the periodic sampling of the water in the system for bacteria. When sampling water quality, the following things should be considered:

(a) When to Sample –

It is best to take samples at the same time each month. This will help in long-range planning and insure that enough time is allotted to perform the sampling properly. Select a time that is early in the month. This way, if a sample is somehow contaminated, the operator will be notified by the laboratory in time to get another sample sent. This means that a sampling error will not cause a system to appear to be in violation of the law for a given month. It is also advisable to select a sampling time that is early in the week. This will insure that a sample shipped to a laboratory will not arrive so late in the week that it is left until the following week for testing.

(b) Where to Sample –

Sampling locations should be chosen to systematically cover the entire distribution system. Trouble spots, such as dead ends should not be avoided. This can reveal localized contamination such as contamination from system breaks or cross-connections. The proper fixture to sample water from is an indoor faucet in a clean area. Make sure the faucet is not connected to a cistern, pressure tank, pump, softener, or hot water heater. Also, make sure that the plumbing and fixtures are not new or have not been recently repaired. Samples should not be taken from outdoor faucets due to the likelihood of contamination on the surface. Frost-free hydrants should be avoided as well. If a sample must be taken outdoors, use caution. Avoid dust, splashing rain, snow, and other possible sources
of contamination. Taking samples from “mixing” faucets (where hot and cold water come through the same tap) should be avoided because water coming through the “hot” side may not be representative of the water in the distribution system.

BOARD AND ADMINISTRATION RESPONSIBILITIES

1. Maintain accurate and up-to-date records to successfully manage the water system and keep it financially strong. Testing, treating, storing, pumping and delivering a constant supply of water are expensive. Ensuring that there are no record-keeping errors will help maintain income from the sale of water and service and will determine whether or not the system will prosper.

2. Consider alternate methods of increasing the water system income other than increasing system rates. Increasing income for a water system is possible without increasing rates. Possible methods are as follows:

   (a) Conduct a water audit –

   The water system may cut costs by conducting a water audit. This helps find water within the system that had been previously unaccounted for. Unaccounted water may be caused by inaccurate records or meters, un-metered connections, distribution leaks, or water theft. If water bill records are not accurate, the water system may provide more water than it is getting paid for. Un-metered connections make it impossible to estimate the operation efficiency of the system. Leakage in the system must be minimized. No system is leak-free, but some systems have more leaks than others. Water theft can be prevented by periodically checking the system for illegal taps, reversed water meters and other signs of theft.

   (b) Re-evaluate current system policies –

   If the price of service has increased steadily during the previous years, but the system’s rates and fees have remained the same, it may be time to revise system policies. Requiring all new customers to pay a deposit before starting service is one way to increase income without raising rates. Another way to increase income would be to establish a late payment charge or charge a service fee to connect or disconnect service.

   (c) Maximize system efficiency –

   Another option to increase cash flow is to operate more efficiently. Systems may be able to operate more efficiently by adopting a computer billing system and performing an energy audit to make sure pumps and motors are operating at top efficiency.
3. Increase rates only when the water system is in debt. The cost of water is usually dictated by the system’s financial status. Keeping your customers informed is highly recommended when the water system has to adjust rates.

**REGULATORY AND STATUTORY DATA**

**DEPARTMENT OF ENVIRONMENTAL QUALITY REQUIREMENTS -**

According to Wyoming Department of Environmental Quality (DEQ) rules, constructing, installing or modifying water distribution systems, water treatment plants, wastewater collection systems, wastewater pumping stations, or wastewater treatment plants without a valid DEQ permit-to-construct is prohibited. In order to obtain a permit-to-construct, copies of plans, specifications, design data, or other pertinent data must be submitted to DEQ. Plans, specifications, and the application for a permit-to-construct must bear the signature or seal of a registered professional engineer. Construction must be completed under the direct supervision of a registered professional engineer.

The District is required to enforce a cross-connection control policy under Chapter 12 of DEQ regulations. Cross-connections are connections to water services or waterlines that can result in substances that are not sanitary or otherwise safe to drink being drawn back into that water system. One common example of this is the standard toilet design. If the tank on a toilet was not located above the flush bowl and a toilet were backed up when a suction was created on a waterline, sewage could be drawn into the waterline. A sample cross connection control policy is attached.

**STATE STATUTES -**

*Contracts for public improvements*

a) All contracts for any type of public improvement, excluding contracts for professional services or where the primary purpose is emergency work or maintenance, for any water and sewer district shall be advertised for bid if the estimated cost, including all related costs, exceeds a bid threshold of seven thousand five hundred dollars ($7,500.00), with some exceptions such as work done by employees of the district with supplies and materials purchased by it as provided by statute.

b) The advertisement shall be published on two (2) different occasions, at least seven (7) days apart, in a newspaper having general circulation in the district. The published notice shall state the place, date and time when the bids will be received and publicly opened and the place where interested persons may obtain complete specifications of work to be performed.
c) The contract shall be let to the lowest bidder who shall be determined qualified and responsible in the sole discretion of the governing body. The governing body may reject all bids submitted if it finds that none of them would serve the public interest. For contracts in excess of five hundred thousand dollars ($500,000.00), cities, towns and joint powers boards may pre-qualify contractors who wish to submit bids based on such criteria as the project type and experience, expertise, professional qualifications, past performance, staff proposed, schedule proposed, financial strength, qualification of supervisors proposed to be used, technical solutions proposed or references.

d) Every contract shall be executed by the chairman or in his absence or disability, by the presiding officer of the governing body and by the clerk or designee of the governing body. The successful bidder shall furnish to the district board an approved surety or sureties as specified in the advertisement. The bond or other form of financial guarantee shall meet State of Wyoming statutory requirements.

e) Before advertising for a bid for any work on the construction of any public improvements, detailed plans and specifications shall be prepared, together with an estimate of the probable cost and a form of the proposed contract. Except as provided under State of Wyoming statutory requirements, no contract may provide for the monthly retention of more than ten percent (10%) of the contract price on the amount of work done during the month, as shown by the estimate of the district engineer or designated local official. No progress payment may be made until the district engineer or designated local official has furnished the estimate, together with a certificate that the amount of work estimated to have been done conforms in all material respects with the requirements of the contract.

f) In advertising for any bid, the forms of guarantee required under this section and approved by the district board shall be specified. In addition, bidders shall be required to accompany each bid with a bid bond or if the bid is one hundred thousand dollars ($100,000.00) or less, any other form of bid guarantee approved by the district board, equal to at least five percent (5%) of the total bid amount, with sufficient surety and payable to the district board. The bid guarantee shall be forfeited as liquidated damages if the bidder, upon the letting of the contract to him, fails to enter into the contract within thirty (30) days after it is presented to him for that purpose or fails to proceed with the performance of the contract. The bid guarantee shall be retained by the district board until proper bond or other form of security satisfactory to the district board to secure performance of the contract has been filed and approved. The right to reject any bid is reserved in all bid advertisements. All bids shall be numbered consecutively before they are opened and no further bids may be received after the advertised time of opening bids and any bid is publicly opened. The district board shall give all persons who desire an opportunity to inspect all bids when
they are opened. No bid may be considered unless accompanied by a bid guarantee in the required amount.

g) No contract for which a bond or other form of financial guarantee approved by the district board is required may be assigned or transferred in any manner except by operation of law or consent of the governing body endorsed on the contract. Assignment by any other means renders the contract null and void as to any further performance by the contractor or the assignee, without any act on the part of the district board. The district board may at once proceed to re-let the contract or may at its discretion proceed to complete the contract as agent at the expense of the contractor and his sureties.

h) Before any contractor or his representative receives a final payment on any contract for which a bond or other financial guarantee is required, the district board shall publish in a newspaper of general circulation in the district, at least ten (10) days prior to the final payment, a notice to the effect that persons having claims for labor and material furnished the contractor shall present them to the district board prior to the date specified for payment.

i) Any officer or employee of the district board who aids any bidder in securing a contract to furnish labor, material or supplies at a higher or lower price than that proposed by any other bidder, or who favors one bidder over another by giving or withholding information, or who willfully misleads any bidder in regard to the character of the material or supplies called for, or who knowingly certifies to a greater amount or different kind of material or supplies than has been actually received, is guilty of malfeasance, which renders his office vacant.

j) If an officer or employee is charged under subsection (i) of this section:

(i) The officer or employee:

A. Is entitled to a hearing before the governing body;

B. Shall be served a copy of the charge at least ten (10) working days before the hearing;

C. May present a defense in person or by counsel; and

D. May have the finding of the governing body appealed to the district court.

(ii) The governing body of the district board shall hold a hearing on its own motion or when the charge is signed by at least ten (10) qualified electors of the district and:

A. May compel attendance and testimony of witnesses and production of papers;
B. Shall make findings of fact and conclusions of law; and

C. Shall render a conclusive decision upon a majority vote of the governing body.

k) Any officer or employee of the district board found guilty of malfeasance with regard to a contract shall be punished by a fine of not more than one thousand dollars ($1,000.00).

l) If any person to whom a contract has been awarded has colluded with any person to prevent any other competing bids being made, or has entered into an agreement by which he has made a higher or lower bid than some other person for the purpose of dividing the contract or profits there between two (2) or more bidders, the contract is null and void, and the mayor or manager or joint powers board shall advertise for new bids or upon approval of the governing body provide for the work to be done under the mayor's, manager's or board's own supervision and control.

m) Any contract made in violation of the provisions of this section is void, and any money paid on account of the contract by the district board may be recovered without restitution of the property or benefits received or retained.

n) A public improvement shall not be divided into smaller units for the sole purpose of avoiding the advertising requirement of this section.

o) For purposes of this section "related costs" includes, but are not limited to, labor, labor burden, materials, transportation, storage, equipment, associated overhead and associated depreciation.

**Public works**

a) Drawings, plans, specifications and estimates for public works of the state or a political subdivision thereof involving engineering or land surveying, shall be prepared by or under the personal direction of, and the construction of the works shall be executed under the direct supervision of a qualified registrant within the category involved.

b) Surveys or maps required in connection with land surveying shall be made by or under the personal direction of a qualified registrant.

**OPERATION AND MAINTENANCE RECOMMENDATIONS**

*Winter Operation:*
1. MINIMIZE ICE FORMATION

Ice formation in water tanks can cause extensive damage. Interior sealer or coating damage may result from the abrasive action and/or impact of an ice cap moving within the tank with changing water levels. In any tank, catastrophic structural failure can result from the tremendous forces of ice expansion or the loads created by the weight of ice. Internal accessories, level gauges, overflow weirs, etc., can be ripped from tank walls causing structural damage. To avoid this type of damage you must limit the formation of ice. There are various devices available to assist in this process, including the use of insulation to control heat loss. It is the owner’s responsibility to determine if the use of this tank requires such devices. The most widely used method to control ice in potable water tanks is to keep turning over the tank contents. It is recommended that pumping schedules be maintained so that water is kept moving during periods of lowest demand. On a daily basis, at least one third of the tank volume should be turned over. If necessary, water may have to be discharged to allow fresh, warmer water to be added. Take care to discharge water in an appropriate manner.

Additionally, on tanks supplied with a roof, roof damage can occur when ice formations come in contact with the roof. To help minimize the chance of this type of damage, the high water level in the tank should be lowered during the winter months to keep ice formations from contacting the roof.

2. THAWING A FROZEN TANK

A tank which has frozen has a high risk of structural damage. A tank which is no longer operational because of excessive ice buildup must be thawed immediately to limit further damage. The tank thawing process itself can create substantial risks. Experienced contractors should be employed to carry out the work, usually under the guidance of a consulting engineer. If the tank has experienced an extensive ice buildup requiring a thawing-out process, it should be drained and inspected for damage at the earliest opportunity. Your authorized independent tank dealer can make this inspection and perform repairs at your direction.

CAUTION:
The formation of ice in a tank can result in damage to the tank, its roof (if applicable) and its accessories. The owner/operator must take appropriate steps to limit the formation of ice in the tank.

Inspection and Maintenance:

1. TANK CLEANING

Potable water tanks should be drained and cleaned at least biannually to prevent accumulation of silt and sediment which may affect water quality and damage water meters, valves, etc. Normally a water hose with line pressure water is sufficient. Hot water or cleaning additives are not recommended. Do not use high pressure water. A plan should be established for maintaining adequate water supply during the time the tank is out of service for routine inspection and cleaning.
2. **VISUAL INSPECTION**
   At the time of the regular tank cleaning, a visual inspection must be made to check the painted/coated sheets for any evidence of physical damage. If surface or structural damage is found, contact your authorized independent tank dealer for recommended repair methods.

3. **LADDERS AND PLATFORMS**
   Ladder, ladder cage, and platform connection brackets must be visually inspected for corrosion or damage at each use. Replace damaged brackets if required. Ladder rungs should also be visually inspected to assure they are safe for use. If a safety climbing device was specified, follow the manufacturer’s instructions on proper care and use. The installation or use of fixed interior ladders is not recommended as they are susceptible to corrosion and ice damage.

4. **VENTILATION FOR ROOFED TANKS**
   The tank vent is provided to prevent damage to the tank from pressure and/or vacuum created by normal filling and emptying of the tank. It is designed to prevent most birds, insects and debris from entering the tank. The vent screen must be inspected at least annually. It must be cleared of leaves and debris which would prevent it from functioning properly. Remove the cover and clean the screen thoroughly with a soft brush. Then, reinstall the cover when finished.

5. **OVERFLOW PIPE**
   Overflow pipes can become clogged with debris. To prevent entry of birds or small animals, the discharge ends should be screened, provided with a flap valve, or other method of closure. The overflow pipe should be kept clear and checked regularly to be certain it operates freely.

6. **GRAFFITI AND VANDALISM**
   Painted steel tanks can usually be cleaned with paint remover and/or recoated. A hydrocarbon solvent paint remover wiped on the graffiti with a cloth should be sufficient to thoroughly remove painted-on graffiti. If not, a stiff brush can be used to remove paint. Follow label instructions for the paint remover being used, then wash the cleaned area with mild detergent and water before recoating. If surface or structural damage is found, contact your authorized independent tank dealer for recommended repair methods.

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**DISTRIBUTION SYSTEM**

The entire distribution system should be flushed at least semiannually. Hydrants at the following locations should be flushed on a monthly basis to help improve water quality:

- Buffalo Creek Drive bridge
Charmac Subdivision
Sable Run
Lane 7
Any other dead-end mains in the system

**Flushing:**

Flushing the system will help reduce odor, color, and taste problems in the distribution system especially on dead end mains and in areas of low water consumption. Flushing is the process of opening hydrants and allowing large volumes of water to flow out of the water system under pressure. The following guidelines should be followed:

- All waterlines in the system should be flushed to change out the water in the waterlines at least three times.
- Flushing velocities should be maintained at over 2.5 feet per second. This equates to flows of over 220 gpm in a 6-inch main and 400 gpm in an 8-inch main.
- The entire water system should be flushed at least twice per year.
- Flushing of the system should begin near the connection to the Town system and proceed south.
- Dead end lines and those areas with low flow may need to be flushed monthly.
- The tank needs to be drained biannually.
- Hydrants used for flushing must be opened and closed slowly.

A map has been created identifying the flushing order and length of time each item will need to be flushed to replenish the water with fresh water.

**Leak Detection:**

A leak detection survey was completed in October of 2006. That survey indicted there was one identifiable leak in the South Thermopolis Water & Sewer District water system. That indicates that flows recorded at the main meter, where water enters the District, should match the water use billed to customers closely, once water used for flushing is accounted for in the records.

**Water Meters:**

The District has started a water meter replacement program and is planning to replace water meters this year. The District will be installing Census brand meters during this replacement program.

**Backflow Prevention and Cross-connection Control:**

The District is required to have a cross-connection control policy under DEQ regulations. Following are the basic requirements that must be met:
• Any new residential water connections made will be required to install backflow prevention devices.
• Existing unmodified service connections are “grand-fathered” and do not need to install back-flow prevention devices until replaced.
• Services that are connected to a water main that is being replaced or service lines that are replaced (by owner or the District) will need to install backflow prevention or other appropriate devices.
• A meter assembly with dual check valve is sufficient on low-hazard services. A plumber or the homeowner will need to install an expansion tank and pressure-relief valve venting to atmosphere to protect the piping against damage.
• All high-hazard non-residential connections will need to install and maintain a backflow prevention device, if not already present. According to the DEQ, this rule has existed since 1985. Examples of facilities with probable high-hazard connections include: restaurants, laundries, dry cleaners, irrigation systems, facilities producing or utilizing hazardous substances, sewage treatment plants, mortuaries, refineries, car washes, etc.
• Water supplies shall establish and keep records showing how they are complying with the new regulations. The utility should know where high hazard connections are, make sure backflow prevention devices are in-place, and make sure that they are tested annually.
APPENDIX D

SOUTH THERMOPOLIS WATER & SEWER DISTRICT

POLICY FOR THE CONTROL OF BACKFLOW AND CROSS-CONNECTIONS

SEPTEMBER, 2007
A POLICY FOR THE CONTROL OF BACKFLOW AND CROSS-CONNECTIONS

ADOPTED PURSUANT TO THE REQUIREMENTS OF
THE WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY RULES AND REGULATIONS
CHAPTER 12, SECTION 14, SUBSECTION i, ENTITLED
“CROSS-CONNECTIONS”
WHICH MAY AFFECT POTABLE WATER LINES BELONGING TO
THE SOUTH THERMOPOLIS WATER & SEWER DISTRICT, WYOMING

WHEREAS, the South Thermopolis Water & Sewer District operates a water supply system which serves the South Thermopolis Water & Sewer District and certain surrounding areas;

WHEREAS, it is recognized that cross-connections allowing non-potable water or other foreign substances to contaminate the municipal drinking water supply present an imminent health hazard to both residential and non-residential users of the public water system and the threat of significant economic loss due to disrupted water service to all users including residential, commercial, industrial, and institutional water users and the possibility of liabilities that may be incurred;

WHEREAS, the cost of restoring the public water supply after contamination presents the possibility of substantial financial liability to the South Thermopolis Water & Sewer District;

WHEREAS, the penalty for knowingly violating the Wyoming Department of Environmental Quality Rules and Regulations may be as high a $10,000 per day;

NOW THEREFORE, be it resolved that the South Thermopolis Water & Sewer District in their regular meeting of ________________, 2007 adopted the following Policy for the control of backflow and cross-connections; and directs that a program be developed and implemented to carry out the provisions of this Policy.

SECTION 1 Purpose

The purpose of this Policy is to protect the public potable water supplied by the South Thermopolis Water & Sewer District from the possibility of contamination or pollution by isolating within the customer’s internal distribution system(s) or the customer’s private water system(s) such contaminants or pollutants which could backflow into the public potable water system.

The Policy promotes the elimination or control of existing cross-connections, actual or potential, between the customer’s in-plant potable water system(s) and non-potable water systems, plumbing fixtures and industrial piping systems.

The Policy also provides for the maintenance of a continuing program of cross-connection control with a goal to systematically and effectively prevent the contamination or
pollution of all potable water systems, and provides for discontinuance of service for violation of the Policy.

SECTION 2 Definitions

Approved – Accepted by the Water Commissioner as meeting an applicable specification stated or cited in this Policy, or as suitable for the proposed use.

Backflow – The undesirable reversal of flow of water or mixtures of water and other liquids, gases, or other substances into the distribution system of the public water supply from any other source or sources.

Back-Pressure – A form of backflow caused when the pressure of the water users’ system is greater than that of the water supply system. This could be caused by a pump, elevated tank, elevated piping, boiler, pressurized process, pressurized irrigation system, air pressure or any other cause of pressure.

Back-siphonage – A form of backflow caused by negative or reduced pressure in the water supply system. This situation can be caused by loss of pressure due to high water demands, a line break, excessive fire fighting flows, etc.

Backflow Preventer – A device or means designed to prevent backflow.

a) Air-Gap – The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device and the flood level rim of said vessel.

b) Reduced Pressure Principle Device – An assembly of two independently acting approved check valves together with a hydraulically operating, mechanically independent pressure relief valve located between the check valves and at the same time below the first check valve. The unit shall include properly located test cocks and tightly closing shut-off valves at each end of the assembly. The entire assembly shall meet the design and performance specifications as determined by a laboratory and a field evaluation program resulting in an approval by a recognized and approved testing agency for backflow prevention assemblies. The assembly shall operate to maintain the pressure in the zone between the two check valves at an acceptable level less than the pressure on the public water supply side of the device. At cessation of normal flow, the pressure between the two check valves shall be less than the pressure on the public water supply side of the device. In case of leakage of either of the check valves, the differential relief valve shall operate to maintain the reduced pressure in the zone between the check valves by discharging to the atmosphere. When the inlet pressure is two pounds per square inch or less, the relief valve shall open to the atmosphere. To be approved, these devices must be readily accessible for in-line testing and maintenance and be installed in a location where no part of the device will be submerged.

c) Double Check Valve Assembly – An assembly of two independently operating approved check valves with tightly closing shut-off valves on each end of the check valves, plus properly located test cocks for the testing of each check valve. The entire assembly shall meet the design and performance specifications as determined by a
laboratory and field evaluation program resulting in an approval of a recognized and approved testing agency for backflow prevention assemblies. To be approved these devices must be readily accessible for in-line testing and maintenance.

d) Dual check - A device conforming to ASSE Standard #1024 consisting of two independently acting check valves. Dual check valves are allowed only for residential water service connections that have a low hazard potential with back pressure or back-siphonage under continuous pressure.

Contamination – An impairment of the quality of the potable water by sewage, industrial fluids or waste liquids, compounds, or other materials to a degree which degrades the quality of the potable water or creates an actual or potential hazard to the public health through poisoning or through the spread of disease.

Cross-Connection – Any physical connection or arrangement of piping or fixtures between two otherwise separate piping systems; one of which contains potable water and the other non-potable water or industrial fluids of questionable safety, through which, or because of which, backflow may occur into the potable water system. This would include any temporary connections, such as swing connections, removable sections, four-way plug valves, spools, dummy sections of pipe, swivel or change-over devices or sliding multi-port tube.

Cross-Connections – Controlled – A connection between a potable water system and a non-potable water system with an approved backflow prevention device properly installed and maintained so that it will continuously afford the protection commensurate with the degree of hazard.

Cross-Connection Control by Containment – The installation of an approved backflow prevention device at the water service connection to any customer’s premises where it is physically and economically infeasible to find and permanently eliminate or control any or all actual or potential cross-connections within the customer’s water system; or the installation of an approved backflow prevention device on the service line leading to and supplying a portion of a customer’s water system where there are actual or potential cross-connections, within the customer’s premises which cannot be effectively eliminated or controlled at the point of the cross-connection.

Water Commissioner – The Water Commissioner is the Water System Operator for the South Thermopolis Water & Sewer District, and is invested with the authority and responsibility for the implementation of an effective cross-connection control program and for the enforcement of the provisions of this Policy and corresponding Wyoming Department of Environmental Quality Rules and Regulations.

DEQ – The Administrator of the Wyoming Department of Environmental Quality or a representative of the Administrator.

Hazard Classification Surveyor – Hazard classifications shall be conducted by hazard classification surveyors that are certified by the USC-Foundation for Cross-Connection Control and Hydraulic Research, the American Society of Sanitary Engineers
Appendix D

Hazard, Degree of – An evaluation of the potential risk to public health and the adverse effect of the hazard upon the potable water system.

a) Hazard – High – A situation created when any substance which is or may be introduced into a public water supply poses a threat to public health through poisoning, the spread of disease or pathogenic organisms, or any other public health concern. Premises having (1) internal cross-connections that cannot be permanently corrected and controlled, or (2) intricate plumbing and piping arrangements or where entry to all portions of the premises is not readily accessible for inspection purposes, making it impracticable or impossible to ascertain whether or not dangerous cross-connections exist shall be considered a high hazard service connection.

b) Hazard – Low – a situation created when any substance which is or may be introduced into a public water supply does not pose a threat to public health but which does adversely affect the aesthetic quality of the potable water. This includes all residential service connections where a hazard survey has not been completed and domestic non-residential service connections not identified as high hazard connections.

c) Hazard – Extreme - In the case of any water users’ system where, in the opinion of the District or the DEQ, an undue health threat is pose because of the presence of extremely toxic substances or potential back pressures in excess of the design working pressure of the device, the Water Commissioner may require an air gap at the water service connection to protect the public water system.

District – The South Thermopolis Water & Sewer District.

Water – Potable – Any water which, according to recognized standards, is safe for human consumption.

Water – Non-Potable – Water which is not safe for human consumption or which is of questionable safety.

Water – Service Connection – The terminal end of a service connection from the public potable water system; i.e., where the District loses jurisdiction and sanitary control over the water at its point of delivery to the customer’s water system. If a meter is installed at the end of the service connection, then the service connection shall mean the downstream end of the meter. There should be no unprotected takeoffs from the service line ahead of any meter or backflow prevention device located at the point of delivery to the customer’s water system. Service connection shall also include water service connection from a fire hydrant and all other temporary or emergency water service connections from the public potable water system.

Water – Used – Any water supplied by the District from the public potable water system to a consumer’s water system after it has passed through the point of delivery and is no longer under the sanitary control of the District.
Water System

a) The water system shall be considered as made up of two parts: The District’s Water System and the Customer’s System.

b) The District’s Water System shall consist of the source facilities and the distribution system; and shall include all those facilities of the water system under the complete control of the District, up to the point where the customer’s system begins.

c) The source facilities shall include all components of the facilities used in the production, treatment, storage, and delivery of water to the distribution system.

d) The distribution system shall include the network of conduits used for the delivery of water from the source to the customer’s system.

e) The customer’s system shall include those parts of the facilities beyond the termination of the District’s distribution system which are used in conveying District-delivered domestic water to points of use.

SECTION 3 Responsibility

The Water Commissioner shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow of contaminants or pollutants through the public potable water service connection. If, in the judgment of said Water Commissioner, based on information provided by an authorized hazard classification surveyor, an approved backflow prevention device is required at the customer’s water service connection; or, within the customer’s private water system for the safety of the water system, the Water Commissioner or his designated agent shall give notice in writing to said customer to install such an approved backflow prevention device(s) at specific location(s) on his premises. The customer shall immediately install such approved device(s) at his own expense; and failure, refusal, or inability on the part of the customer to install, have tested, and maintain said device(s) shall constitute grounds for discontinuing water service to the premises until such requirements have been satisfactorily met.

The Water Commissioner shall maintain documentation of all non-residential connections to the District water system indicating the hazard classification of each connection, name and address of the hazard classification surveyor, dates and results of testing and hazard classification survey, any modification or repair of back-flow prevention devices, and any other pertinent information deemed appropriate by the Water Commissioner.

The Water Commissioner or a designated representative shall perform or cause to be performed a hazard classification survey to determine the level of hazard associated with each non-residential water service connection.

SECTION 4 Requirements
Pursuant to Section 3, the following requirements are part of the District’s policy for protection of the water supply.

1) No water service connection to any premises shall be installed or maintained by the District unless the water supply is protected as required by Chapter 12, Section 14, Subsection i of Wyoming Department of Environmental Quality Water Quality Rules and Regulations; State Statutes; and this Policy. Service of water to any premises shall be discontinued by the District if a backflow prevention device required by this Policy is not installed, tested, and maintained at the customer’s expense; or if it is found that a backflow prevention device has been removed, by-passed, or if an unprotected cross-connection exists on the premises. Service will not be restored until such conditions or defects are corrected.

2) The customer’s system shall be open for inspection at all reasonable times to authorized representatives of the District to determine whether cross-connections or other structural or sanitary hazards, including violations of this Policy, exist. When such a condition becomes known, the Water Commissioner shall deny or immediately discontinue service to the premises by providing for a physical break in the service line until the customer has corrected the condition(s) in conformance with State and District statutes relating to plumbing and water supplies and the regulations and codes adopted pursuant thereto.

3) An approved backflow prevention device shall also be installed, at the customer’s expense, on each service line to a customer’s water system at or near the property line or immediately inside the building being served; but, in all cases, before the first branch line leading off the service line wherever the following conditions are met:

   a) A new low-hazard service connection is made or an existing low-hazard service connection is modified, reconnected to a main, or activated.

   b) A high-hazard service connection is identified through a hazard classification survey or other means and the facility owner is notified by the Water Commissioner that a backflow prevention device is needed. For existing facilities, owners shall have 30 days to install an approved device after the date of notification. New or modified services shall install an approved device prior to activation. Existing backflow prevention devices found to be defective or functioning improperly shall be immediately repaired or replaced.

   c) An extreme-hazard connection is identified through a hazard survey or other means and the owner or operator is notified. The service connection to any facility identified as having an extreme hazard shall immediately be terminated. Service shall not be restored until an approved device is installed or other modification made to the customer’s system to eliminate the extreme hazard.

   d) The following table shows the type of backflow prevention device required to be installed based on the level of hazard associated with a service connection as determined by a hazard survey.
## Backflow Prevention Devices, Assemblies and Methods

<table>
<thead>
<tr>
<th>Device, Assembly or Method</th>
<th>Degree of Hazard</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Hazard</td>
<td>High Hazard</td>
</tr>
<tr>
<td></td>
<td>Back-Siphonage</td>
<td>Back-Pressure</td>
</tr>
<tr>
<td>Air gap</td>
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<td>X</td>
</tr>
<tr>
<td>Atmospheric Vacuum Breaker</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Spill-proof Pressure-type Vacuum Breaker</td>
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<td>X</td>
</tr>
<tr>
<td>Double Check Valve Backflow Preventer</td>
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</tr>
<tr>
<td>Pressure Vacuum Breaker</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Reduced Pressure Principle Backflow Preventer</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dual Check</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Note 1:** For spouts with an effective opening diameter of one-half inch or less, the minimum air gap when the discharge is not affected by side walls shall be one inch. The minimum air gap when the discharge is affected by sidewalls shall be one and one-half inches. For effective openings greater than one-half inch, the minimum air gap shall be two times the effective opening diameter when the discharge is not affected by side walls. The minimum air gap when the discharge is affected by sidewalls shall be three times the effective opening diameter.

All backflow prevention devices other than air gaps have the potential to damage piping systems if adequate pressure control mechanisms are not installed. The minimum devices that should be installed to assure potential damage to piping and water damage to property is reduced are an expansion tank and a pressure release valve which may be integral to the water heater. Plumbers should consult the plumbing code adopted by the District and comply with requirements found therein to protect the customer’s system.

4) The type of protective device required under subsection (3) above shall depend
upon the degree of hazard and type of use as follows:

   a) Residential service connections where no business is performed are considered to be low-hazard back-siphonage connections, unless a hazard classification survey indicates that another hazard classification is applicable.

   b) Non-residential domestic services and home businesses are considered to be low hazard back-pressure connections, unless a hazard classification survey indicates that another hazard classification is applicable.

   c) Non-domestic commercial or industrial water service connections shall be considered to be high-hazard back-pressure connections, unless determined otherwise by a hazard survey. Examples include restaurants, refineries, chemical mixing facilities, sewage treatment plants, mortuaries, laboratories, laundries, dry cleaners, irrigation systems, facilities producing or utilizing hazardous substances, car washes, etc. For some of these service connections, a hazard survey may result in a determination of a low-hazard back-siphonage or low-hazard back-pressure classification. The backflow prevention device shall be appropriate to the hazard classification. Where potential high-hazards exist within the non-residential water user's system, even though such high-hazards may be isolated at the point of use, an approved backflow prevention device shall be installed and maintained at the water service connection. The public water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device, at the expense of the owner of the premises.

   d) In the case of any premises where there are “uncontrolled” cross-connections, either actual or potential, the public water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device at the service connection, at the expense of the owner of the premises.

   e) In the case of any premises where, because of security requirements or other prohibitions or restrictions, it is impossible or impractical to make a complete in-plant cross-connection survey, the public water system shall be protected against backflow from the premises by either an approved air-gap separation or an approved reduced pressure principle backflow prevention device on each service to the premises, at the expense of the owner of the premises.

   5) Any backflow prevention device required herein shall be a model and size approved by the Water Commissioner and DEQ. The term “Approved Backflow Prevention Device” shall mean a device that has been manufactured in full conformance with the latest revision of American Water Works Association (AWWA) Standard C510 for Double Check Valve Backflow Prevention Devices and/or AWWA Standard C511 for Reduced Pressure Principle Backflow Prevention Devices, and have met completely the laboratory and field performance specifications of the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California (USC-FCCCHR), International Association of Plumbing/Mechanical Officials (IAPMO), or American Society of Sanitary Engineers (ASSE).

      Final approval shall be evidenced by a “Certificate of Approval” issued by an
approved testing laboratory certifying full compliance with said AWWA standards and USC-FCCCHR, IAPMO, or ASSE specifications. Backflow preventers which may be subjected to back pressure or back siphonage that have been fully tested and have been granted a Certificate of Approval by said qualified laboratory and are listed on the laboratory’s current list of “Approved Backflow Prevention Devices” may be used without further test or qualification.

All devices, except dual checks meeting ASSE Standard #1024, shall be in-line serviceable, in-line testable, and installed according to manufacturer’s recommendations. ASSE Standard #1024 dual checks may be used by default on residential services and on domestic non-residential services if a hazard survey indicates that only a low-hazard back-siphonage potential exists.

6) It shall be the duty of the customer-user at any premises where backflow prevention devices are installed on high-hazard non-residential services to have certified inspections and operational tests made at least once per year. These inspections and tests shall be at the expense of the water user and shall be performed by a hazard classification surveyor certified by USC-FCCCHR, ASSE, or a DEQ approved certification program approved by the Water Commissioner. The customer-user shall notify the Water Commissioner in advance when the tests are to be undertaken so that District representatives may witness the tests if so desired. These devices shall be repaired, overhauled, or replaced at the expense of the customer-user whenever said devices are found to be defective. Records of such tests, repairs and overhaul shall be submitted to the Water Commissioner before December 31 of each year and copies of the records for the most recent three years kept and made available at the Water Commissioner’s request.

7) Residential service connections which do not meet the requirements of this section, but that were approved devices for the purposes described herein at the time of installation, shall be excluded from the requirements of these rules so long as the Water Commissioner is assured that potential contamination of the District’s water system is minimal. Whenever the existing service is moved from the present location, replaced, reconnected to a new main, or requires more than minimum maintenance, or when the Water Commissioner finds that the maintenance constitutes a hazard to health, an approved backflow prevention device meeting the requirements of this section shall be installed.
SECTION 5  Discontinuance of Service

The District shall deny or discontinue water service to a premises if a required backflow prevention device is not installed or properly maintained. Water service shall not be restored to such premises until the deficiencies have been corrected or eliminated to the satisfaction of the Water Commissioner and/or DEQ.

PASSED, APPROVED AND ADOPTED this ___th day of December, 2007.

__________________________________
Harvey Seidel, Board Chairman

ATTEST:

__________________________________
Boyd Moon, Treasurer/Secretary
TAP #_________________ TAP SIZE _______________ DATE ____________

WATER USER CONTRACT

OWNER’S NAME________________________________________________________

OWNER’S MAILING ADDRESS____________________________________________

CITY__________________________ZIP___________PHONE___________________

SERVICE ADDRESS_____________________________________________________

THERMOPOLIS, WY 82443

THIS WATER TAP CONTRACT is made and entered into between the SOUTH THERMOPOLIS WATER & SEWER DISTRICT, hereafter the “DISTRICT”, and the undersigned Owner, hereafter the “OWNER”.

WHEREAS, the OWNER desires to purchase water from the DISTRICT and to enter into a Water Tap Contract as required by the Rules and Regulations governing the operation of the DISTRICT’S rural water system;

NOW, THEREFORE, in consideration of the mutual covenants, promises, and agreements herein contained, the sufficiency of which are hereby mutually acknowledged, it is hereby understood and agreed by the parties hereto as follows:

1. SERVICE – OWNER hereby contracts for the following service from the DISTRICT for the corresponding fees:
   - Residential domestic $_______________
   - (Circle One) Active Inactive
   - Dual residential domestic/livestock $_______________
   - (Circle One) 2-5/8” 5/8”&3/4” 5/8”&1”
   - Commercial $_______________
   - (Circle One) 5/8” 3/4” 1” 1½” 2”
   - Administrative (Computed by District) $_______________
   - Application Recording Release
   - Petition for Inclusion $_______________

Date Service will start: ________________ TOTAL FEE: $_______________
2. **LEGAL DESCRIPTION** – This Contract shall apply to and constitute an encumbrance upon those lands owned by OWNER located in Hot Springs County, Wyoming, that are within the DISTRICT and the DISTRICT shall furnish, subject to the limitations set out in its Rules and Regulations now in force or as hereinafter amended, water service to OWNER’S land specifically described in EXHIBIT A attached hereto.

3. **PETITION FOR INCLUSION AND LIABILITY FOR TAXES** – If at the time of signing this Contract the OWNER’S property is not included with in the DISTRICT, the OWNER shall sign a Petition for Inclusion of his property into the DISTRICT and pay the $20.00 administrative fee required to defray the cost of publishing a legal notice concerning the Petition. OWNER understands and agrees that formal action on his Petition for Inclusion may not occur until a later date. OWNER further understands and agrees that the DISTRICT has the power and authority to levy and collect general (ad valorem) taxes on his property described herein to pay DISTRICT indebtedness. Should the DISTRICT ever be forced to levy and collect such taxes OWNER agrees that his property described herein would be forced to bear the same tax burden as other lands within the DISTRICT.

4. **WATER SERVICE AND RULES AND REGULATIONS OF DISTRICT** – OWNER hereby agrees to pay such sums as are required by the DISTRICT to connect to the water system. OWNER agrees to pay for water service at such rates, time and place as required by the Rules and Regulations of the DISTRICT, to comply and be bound by the Rules and Regulations governing the operation of the DISTRICT’S water system, now in force or as hereinafter amended, and further agrees to the imposition of such penalties for noncompliance as are set out in the Rules and Regulations of the DISTRICT, or which may hereafter be adopted and imposed by the DISTRICT. OWNER hereby acknowledges he has received a copy of the Rules and Regulations of the DISTRICT now in force and effect, the same being incorporated herein by this reference as if more fully set forth.

5. **PERPETUAL LIEN AND DISCONTINUANCE OF SERVICE** – Pursuant to Wyoming Statute 41-10-113 (xxi) and this Contract, until paid, all rates, tolls or charges shall constitute a perpetual lien on and against the property served, and such lien may be foreclosed in the same manner as provided by the laws of the State of Wyoming for the foreclosure of mechanic’s liens. The DISTRICT may shut off or discontinue service for delinquencies in the payment of such rates, tolls or charges, or in the payment of taxes or assessments levied pursuant to W.S. 41-10-101 et. seq., and prescribe and enforce rules and regulations for the connection with and the disconnection from properties of the facilities of the DISTRICT. OWNER further agrees that this contract binds the owner(s)/legal title holder(s), their heirs, successors and assigns to repay the contract holder’s share of the debt for construction of the distribution system of the DISTRICT and that this Contract constitutes a lien that shall run with the described real property until released by the DISTRICT.
6. EQUIPMENT INSTALLED BY DISTRICT – The DISTRICT will install a water meter, meter pit, shut-off valve, and lines for each service. A separate meter will be installed for each dwelling, house, building, or mobile home contracted for unless otherwise authorized by the DISTRICT. The DISTRICT shall have the exclusive right to use of such water meter, meter pit, shut-off valve, and lines. The water meters, meter pit, shut-off valves and lines shall remain the property of the DISTRICT.

7. RIGHT TO ENTER PREMISES – OWNER hereby gives the DISTRICT or its authorized agent’s permission to enter OWNER’S premises at all reasonable times for the purposes of installing, inspecting, repairing, maintaining, or removing any or all of the apparatus used in the connection with the supply and metering of water.

8. DISTRICT AUTHORITY – OWNER hereby acknowledges that the DISTRICT shall have final authority in any question of location of any service line connection to its distribution system, shall determine the allocation of water to USER in the event of water shortage, and may shut off water to a USER who allows a connection or extension to be made to his service line for the purpose of supplying water to another USER. In the event the total water supply shall be insufficient to meet all of the needs of the USER, or in the event there is a shortage of water, the DISTRICT may prorate the water among the users on the basis as is deemed equitable by the DISTRICT Board of Directors and may also prescribe a schedule of hours covering the use for garden purposes by users and require adherence thereto or prohibit the use of water for garden purposes; provided that, if at any time the total water supply shall be insufficient to meet all of the needs of all the users, the DISTRICT must first satisfy all of the needs of all users for domestic purposes before supplying any water for other purposes.

9. CROSS-CONNECTIONS – OWNER hereby agrees that no cross-connection may be made that will allow hazardous, polluted or contaminated water or other substances, to enter into any part of the potable water system under any conditions. If another source of water is connected to the water user’s system, a CHECK VALVE must be installed to prevent backflow to the DISTRICT’S system.

10. SERVICE CONNECTION – OWNER hereby agrees he shall connect the service lines to the DISTRICT’S distribution system. Water charges to the OWNER shall commence on the date water service is made available by the DISTRICT, regardless of whether the OWNER is using of said water service.

11. OPERATIONS AND MAINTENANCE AND DEBT RETIREMENT CHARGES – On and from the date water service is made available by the DISTRICT, regardless of whether OWNER(S)/legal title holder(s) is/are using said service, OWNER(S)/legal title holder(s), their heirs, successors and assigns, hereby agree to repay OWNER(S)/legal title holders(s) share of the debt retirement for construction of the DISTRICT’S distribution system and operation and maintenance charges on the DISTRICT’S distribution system, on a monthly basis and as billed.
12. DEFAULT, BANKRUPTCY AND ATTORNEY’S FEES AND COSTS – If the undersigned fails to pay any sums due under this Contract as set forth herein or files for bankruptcy or is adjudicated bankrupt or makes an assignment for the benefit of creditors, the DISTRICT shall have the right at any time thereafter to declare the entire unpaid debt and all accrued interest, immediately due and payable. If the indebtedness represented hereby, or any part thereof, be collected at law, or in equity, bankruptcy, receivership, or other court proceedings, or if this Contract is placed in the hands of an attorney for collection, the undersigned, jointly and severally, promise to pay, in addition to the full principal debt and all accrued interest due and payable pursuant to this Contract, all costs and expenses of collection, including reasonable attorney’s fees.

13. SPECIAL PROVISIONS – Attached hereto as Exhibit “A” and incorporated by this reference, is a statement or list of special provisions agreed to by the parties that meets the special circumstances, if any, of the DISTRICT and the OWNER(S).

IN WITNESS WHEREOF, I/we have executed this contract this ___ day of __________, 20__.

________________________________ ______________________________
OWNER     OWNER

STATE OF WYOMING  }
   } SS.
COUNTY OF HOT SPRINGS}

The foregoing document was acknowledged before me by this ___ day of __________, 20__.

My Commission Expires: __________________________
APPENDIX F

SOUTH THERMOPOLIS WATER & SEWER DISTRICT

WATER SERVICE CONTRACT CHECKLIST

SEPTEMBER, 2007
1. Read and understand rules and regulations of the District
2. Complete application and submit with appropriate tap fee
   a. Determine if property is in the District
   b. If user is outside of District, user will have file a petition to be included in the District
   c. Verify that adequate taps are available under the agreement with Thermopolis and/or adequate water rights are available. Transfer water rights to the District to cover domestic needs
3. Complete contract with the District for service
4. Work with District personnel to identify tap location
   a. If tapping in WYDOT right-of-way, obtain permit from WYDOT for construction
   b. If tapping in Hot Springs County right-of-way, follow county's requirements for construction
5. Coordinate construction with the District
   a. A designated District representative needs to observe tap and corporation stop prior to backfilling
   b. A designated District representative needs to observe backflow prevention device prior to providing service
6. Request water service from the District
   a. A designated District representative will confirm that proper metering equipment is installed, turn on the curb stop, and take the initial reading on the meter