EXECUTIVE SUMMARY

WRIGHT WATER & SEWER DISTRICT
WATER SUPPLY LEVEL II STUDY
WELL NO. RJ-7

Prepared for:
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Cheyenne, Wyoming

and

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1 INTRODUCTION AND SUMMARY OF RECOMMENDATIONS

1.1 Introduction

Wright Water and Sewer District (WWSD) applied to the Wyoming Water Development Commission for funding to complete a Level II Study in relation to the construction and testing of a new water supply well designated as RJ-7. WWSD had completed a Level I Study identifying the need for an additional well in order to meet maximum day demand pumping capacity\(^1\). WWDC conducted an engineer procurement process and awarded the Level II Study to Stetson Engineering, Inc. of Gillette in June 2010.

The RJ-7 test well was constructed to a depth of 3,005 feet into the Fort Union aquifer within the WWSD service area, centered on the Town of Wright, about 35 miles south of Gillette (Figure 1-1). RJ-7 when completed will be the sixth operating well in the WWSD public water system, bringing the instantaneous source capacity to 1,800 gallons per minute (gpm). The test well, as detailed below, has been rated at 300 gpm, and produces groundwater of similar quality as the five existing wells (RJ-2 through RJ-6).

The project was conducted as a Level II Study in order to evaluate drilling technology and well construction types that could be used. The City of Gillette and one Gillette-area subdivision had recently constructed similar wells as RJ-7 using the reverse-rotary drilling method and an artificially filter-packed screen. The Level II Study included an evaluation of the drilling and completion methods, which was subsequently used as a basis for the design and construction of the RJ-7 test well. The principal finding of this evaluation was to construct the RJ-7 well using direct-rotary drilling and to complete the well using a liner-screen, without artificial filter pack.

During design of the RJ-7 test well, consideration was also given to future dewatering of the aquifer and interference pumping effects caused by the WWSD wells. It was found that declines in static water level in the wells favored that pump settings be as deep as possible; otherwise over time declining static water levels could decrease capacity. Although these considerations did not substantially alter the design of the RJ-7 test well, the Level II Study was used as a means to assess if deeper sandstone beds were present, and how much water was contributed through the screens of the RJ-7 well. These data together would provide useful information for the WWSD to plan future wells.

The Level II Study also evaluated and identified infrastructure alternatives needed to complete and connect the new RJ-7 well into the existing system.

\(^1\) Wright Master Plan Level I Study (Dec 2009) report by Stetson Engineering, Inc. for Wyoming Water Development Commission and Wright Water and Sewer District.
WRIGHT WATER & SEWER DISTRICT, WYOMING

TOWN OF WRIGHT VICINITY MAP

FIGURE 1-1

WRIGHT WATER & SEWER DISTRICT, WYOMING
PROJECT AREA MAP
1.2 Summary of Recommendations

A total estimated cost is provided with each recommendation. A detailed breakdown of these costs are provided in the Final Level II Report.

1.2.1 Well

- The RJ-7 well is recommended for a pumping capacity of 300 gpm, an annual volume up to 350 acre-feet, and pump setting of approximately 1,160 feet below ground. Typical pumping water level will range from 875 to 935 feet. A means to measure water level should be included in the completion. A slow start pumping system is recommended to avoid excessive pumping at start-up and to protect the borehole from destabilization.

The estimated cost to complete the well and control building = $702,500.00

1.2.2 Storage

Future storage facilities should be constructed on the RJ-7 site (see figure 3-1). The site has already been purchased and sized for two - one million gallon storage tanks. A subsurface investigation has also been completed for the foundation recommendations. The future tanks are recommended to be elevated tanks to match the existing system pressures and not contain unusable storage.

The estimated cost to complete a new one million gallon tank and associated infrastructure = $2.3 million

1.2.3 Treatment

A new gas chlorination treatment facility should be completed on the RJ-7 site (see figure 3-1). The chlorination facility should be completed with the completion of RJ-7 well and the transmission mains. The facility is needed to allow the District to take the existing treatment facility off line and complete essential repairs.

The estimated cost to complete the well and control building = $702,500.00
1.2.4 Transmission

New transmission mains will be required to connect the new RJ-7 well into the existing system (see figure 3-2). Both Raw water and potable water transmission mains are need to provide flexibility in the system to be able to treat water from either the existing or new treatment facility and to be able to isolate the tanks for repairs and rehabilitation when needed. The following transmission mains will be required.

Potable Water

- The new treatment Facility and Southern Tank should be connected to the existing potable water system at two locations. The first section should be a 12-inch PVC main installed parallel to the new raw water transmission main to a point about 280 feet east of the raw water connection on Melicia Drive. At this point it will connect to the existing 12-inch PVC potable water transmission main. The second section should also be a 12-inch PVC main and should connect to the existing 12-inch main about 2,100 feet to the east on Duffy Road. The total length of this 12-inch PVC is approximately 5,900 lineal feet.

Raw Water

- The RJ-7 well should be connected to the existing raw water system with an 8-inch PVC line at a point on Melicia Drive between RJ-6 and RJ-5 wells. Connection at this point will allow the supply from RJ-5, RJ-6, & RJ-7 to be treated and put into the system either at the existing chlorination and storage location or at the location of the new chlorination and storage. The supply from all three wells will be required to maintain the system when the existing tank and or the existing treatment facility are off line for repair. The total length of this 8-inch PVC is approximately 4,275 lineal feet.

- The raw water transmission main between RJ-5 and the existing treatment facility must be upsized from 8-inch PVC to 12-inch PVC. The total length of this 12-inch PVC is approximately 2,450 lineal feet.

The estimated cost to complete the Transmission mains and the associated infrastructure = $1.03 million.

1.2.5 Easements

Existing permanent easements and right-of-ways have already been obtained by the WWSD for the line and are discussed in more detail in Section 4 of the Final Study Report.
1.2.6 **SCADA**

The Wright Water and Sewer District’s current telemetry system is unable to have remote terminal units added to it. The system is restricted due to the age of the controllers and the DOS based software application. The system will need to be upgraded to add the new RJ-7 well, treatment facility, and storage tank. The telemetry system should be designed to be expandable to include future additions to the water system including wells RJ-8 & RJ-9, and include a second southern storage tank on the RJ-7 site (see figure 3-3).

The estimated cost to complete the SCADA system = $302,500.00

1.2.7 **RJ-3**

Because of the age and condition of the RJ-3 Pumphouse and vault facility the WWSD has determined that upgrades are required at this time. Complete upgrade of the facility will include removing all of the existing above ground and underground infrastructure and installing a new above ground pump control facility.

The current RJ-3 facility is a combination of Electrical Pump Control above ground and all other piping, well control, and metering done in an underground vault. Because of the dangers of underground facilities and the increasing enclosed space regulations, the District is removing all these structures during the upgrade.

The estimated cost to upgrade the RJ-3 facility = $289,000.00
2 ECONOMIC ANALYSIS AND RECOMMENDATION FINANCING

The financial plan assumes that the terms and availability of the outside funding will be as described in the following sub-sections. These assumptions are based on discussions and previous dealings with funding agencies.

Wyoming Water Development Commission (WWDC)

- Currently 67% Grant funding is available for new wells, tanks, and transmission lines.
- Loans are also available through the WWDC for the balance of the project funding. The WWDC loans are currently at a rate of 4% for a term not to exceed 50 years. However the WWSD is not in need of a loan at this time.

Campbell County Capital Facilities Tax

- The Capital Facilities Tax will raise about 110 million dollars over the next 4 years (2012 -2015).

Office of State Lands and Investments (SLIB)

- 50% grant funding is available for all water projects.
- Loans are available from the SLIB a current rate of 6% for 30 years.
- Grants are difficult to obtain from the SLIB unless it is an extreme situation.

Drinking Water State Revolving (Loan) Fund (SRF)

- The WWSD is eligible to receive funding through the SRF.
- The DWSRF loan current interest rate is 2.5% for 20 years.
- The WWSD RJ-7 Well, Tank and Transmission is currently ranked 179 out of 203 on the 2012 Drinking Water Intended Use Plan. This would make it difficult at this time to get a loan from the SRF. However the WWSD is not in need of a loan at this time.

All of the system improvements discussed in Section 3 of the report are eligible for funding from the WWDC. At this time the WWSD with assistance through HDR Engineering and the WWDC have determined to pursue funding for the project at a 67% grant from the WWDC and the remaining 33% match coming from the Campbell County Capital Facilities tax.