

Kettle Falls Water System
Documentation of Project Needs

PWSID No. 0045987

(Additional documentation that is referred to is not attached for this exercise.)

Kettle Falls has one surface water source (the Yellowstone River) with water rights of 4.2 MGD. A raw water transmission line, which is over 100 years old and in disrepair, brings water to the city's 10-year old direct filtration plant which is occasionally unable to meet existing turbidity standards (due to spring runoff, etc.). Because of high raw water turbidity, there are extended periods of time when the plant cannot produce water of "optimal" quality. The plant is down stream of several municipal waste water discharges and the State believes it should have a conventional plant that can produce water at or below 0.1 NTU.

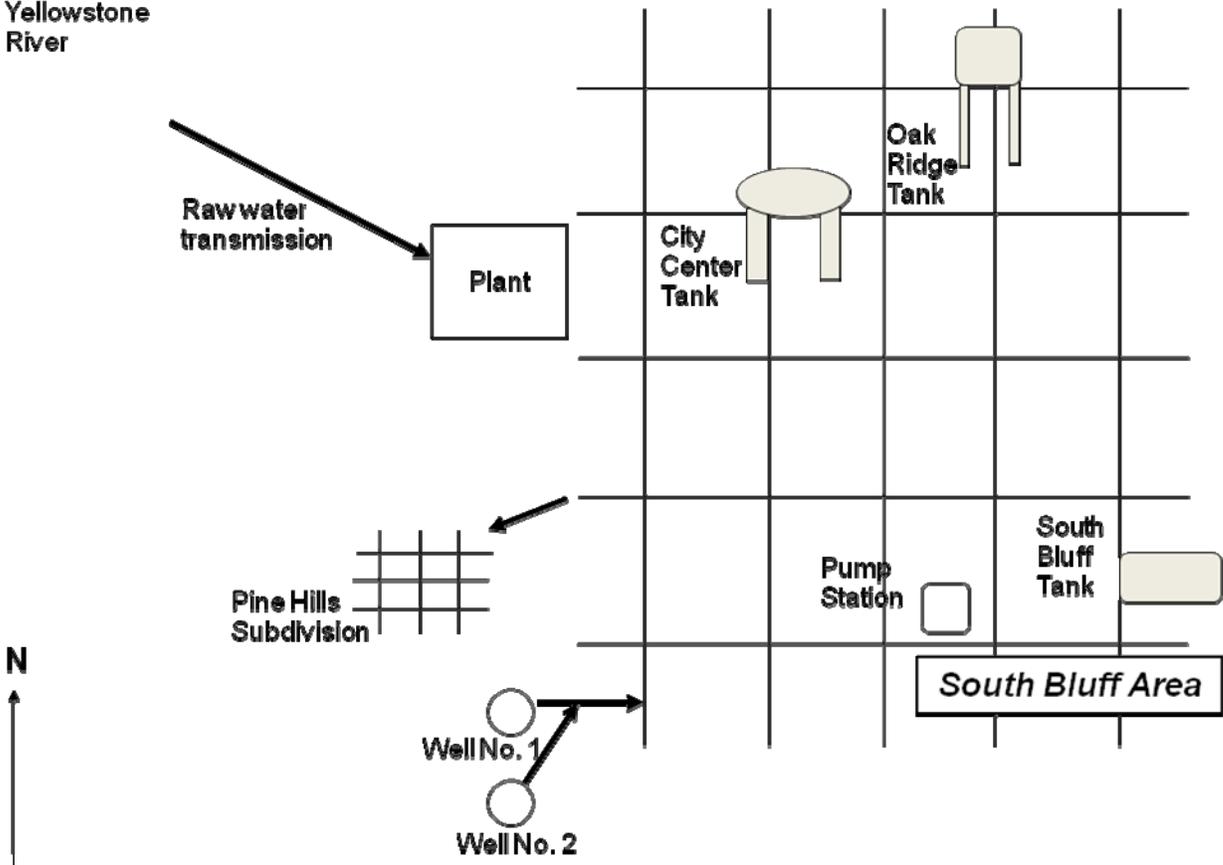
Surface water is supplemented with up to 300 gpm (0.4 MGD) of ground water from two wells. The ground water contains iron and manganese and is currently without treatment.

Storage is provided by 2 elevated steel tanks and 1 concrete reservoir. There is one 2.0 MGD pump station that helps to fill the South Bluff tank. This station is located in a below-grade vault that is an unsafe confined space.

The distribution system is in adequate condition overall and consists of cast iron, ductile iron, and PVC pipe. Ductile iron pipe that was in poor condition was recently cleaned and lined. Some of the cast iron pipe was replaced with PVC but the rest of the cast iron, which is 75 to over 100 years old, has breaks and leaks and will need to be replaced.

The individual wells at the nearby Pine Hills Subdivision have been contaminated by VOCs. The City intends to construct a water main to this area to serve these homes.

Figure 1 Kettle Falls PWS Schematic



- 1) Replacement of Well No. 1 (100 gpm):** Well No. 1 has lost about half of its original capacity due to fouling with iron and iron bacteria. The most recent rehab had little improvement on production. It is in need of replacement now. (Recorded as Project 1000)
- 2) Rehab of Well No. 2 (200 gpm):** Based on past experience from fouling of the screen with iron and iron bacteria, Well No. 2 will need rehabilitation within the next 5-10 years. Future need. (Recorded as Project 1001)
- 3) Phosphate Addition–Wells No. 1 and 2 (300 gpm):** Because of high iron and manganese levels, both wells need treatment to sequester the metals and reduce staining problems in the system. (See lab sheet for metal concentrations.) The system also intends to add disinfection to help maintain a residual throughout the distribution system. The treatment will be housed in a new well house because the existing one is in poor condition and is not adequate to house the treatment. Current need. (Recorded as Project 1002)
- 4) Upgrade of Filtration Plant (5 MGD):** The existing plant (current capacity of 4.2 MGD) will be upgraded to a 5 MGD conventional plant. Flocculation and sedimentation will be added. See attached engineering report for documentation of need and cost (pages 13 - 15). This is a current need and the project will begin construction in May 2016. (Recorded as Project 1003)
- 5) Oak Ridge Tank Rehab (0.1 MG):** The Oak Ridge tank has not been rehabbed and painted in more than 15 years. It is badly in need of repair and repainting. Current need. (Recorded as Project 1004)
- 6) City Center Tank (0.25 MG):** The city center elevated tank is now in good shape but, based on previous experience, the city knows it will have to rehab the tank sometime in the next 10 years. Future need. (Recorded as Project 1005)
- 7) Oak Street Pumping Station (2.0 MGD):** Booster pumping station on Oak Street needs to be replaced. All of the pumps are over 20 years old and showing signs of wear. The station is a below-grade vault that is in extremely poor condition, and unsafe for operators to enter. Current need. (Recorded as Project 1006)
- 8) Auxiliary Power (50 KW):** Auxiliary power is needed at the booster pump station. The station is fed by only one section of the power grid, and experiences regular outages. In the past 2 years pressures in this section of town have dropped below 20 psi during power outages on 5 separate occasions. The public works director estimates a 50 KW generator will be required. It can be used at the existing station and then transferred to the new station when it is finalized. Current need. (Recorded as Project 1007)
- 9) Cast Iron Main Replacement (2,800 feet of 6-inch pipe):** The system has cast iron mains that are 75 to over 100 years old and in need of replacement due to leaks and breaks. Current need. (Recorded as Project 2000)
- 10) Cast Iron Main Replacement (1,500 feet of 8-inch pipe):** The system has cast iron mains that are 75 to over 100 years old and in need of replacement due to leaks and breaks. Current need. (Recorded as Project 2001)

11) Cast Iron Main Replacement (800 feet of 12-inch pipe): The system has cast iron mains that are 75 to over 100 years old and in need of replacement due to leaks and breaks. Current need. (Recorded as Project 2002)

12) Transmission Line (13,200 feet of 18-inch pipe): The raw water transmission line from the Yellowstone River to the treatment plant is over 100 years old. It is cast iron and has leakage problems from one end to the other. Replacement is needed immediately. (Recorded as Project 2003)

13) Distribution Looping (10,350 feet of 8-inch pipe): The system has several areas of town with dead end mains. These areas are plagued with low chlorine residuals, elevated TTHMs, high HPC counts, occasional coliform positive tests, and stagnant water. There are a total of 10 areas of town with documented problems (see TCR sampling results attached) and the city's consultant has estimated that it will require 10,350' of 8" main to eliminate these problems. This project is needed now. (Recorded as Project 2004)

14) Pine Hills Transmission (10,560 feet of 8-inch pipe): The city has agreed to supply water to the Pine Hills Subdivision where the aquifer has become contaminated with VOCs (lab slips attached) and the homeowners intend to abandon their individual wells and connect to the City's water main (see letter from homeowner's association). The City has gone out to bid on a project to install 10,560 feet of 8" diameter pipe to provide water from Kettle Falls to the subdivision. This is a current need and construction is planned for 2016. (Recorded as Project 2005)

15) Replacement of meters (5,000 5/8-inch meters and 200 3/4-inch meters): The system's meters are in good condition now but will require replacement within 20 years. This is a future project. (Recorded as projects 3000 and 3001)

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