



**City of Mountain Home Drinking Water Project**  
**SRF Loan #DW 1105**  
**\$1,952,000**

**Final Green Project Reserve Justification**  
**Business Case GPR Documentation**

INSTALLS 14,300 FEET OF NEW HDPE WATER TRANSMISSION PIPING (Water Efficiency). Business Case GPR per 2.4-3: *Efficient water use...reducing the amount of energy required by a drinking water system...therefore, there are also energy and financial savings*; also per 2.4-4: *Proper water infrastructure management should address where water losses could be occurring in the system and fix or avert them*; also per 2.5-2: *Distribution pipe replacement ...to reduce water loss and prevent water main breaks*; also (Energy Efficiency) Business Case GPR per 3.5-1: *Energy efficient...upgrades*; and, per 3.5-5: *Projects that achieve the remaining increments of energy efficiency.* (\$1,640,000).

# New Water Transmission Line

## Summary

- New transmission line to increase system reliability, mitigate high pressure events, and to reduce energy requirements.
- A total of 13,812 feet of new PVC, HDPE, and Ductile Iron transmission piping will be installed; the new line consists of 2,540 feet of 24” diameter pipe; 9,719 feet of 16” diameter pipe and 1,515 feet of 12” diameter pipe and 38 feet of 8” and 10” pipe.
- Loan amount = \$1,952,000
- Energy saving (green) portion of loan = 84% (\$1,640,000)

## Background

- The water system is experiencing fluctuating high pressure events due to a lack of transmission capacity; the Facility Plan documents a 19% water loss, some of which may be attributable to transient high pressure hot spots.
- As part of a water loss management plan, various distribution alternatives were evaluated to identify potential pipeline rehabilitation/replacement projects. A priority alternative selected was the provision of a new transmission line. This project will install 14,300 feet of 24-inch, 16-inch, and 12-inch pipe.

## Results

- By installing 14,300 feet of new transmission line, the City anticipates conserving water while saving energy.
- A review of the energy costs of several wells showed that transmission line cost savings are anticipated for Wells 6, 11 and 13. The decline in system pressures due to the new transmission line observed near these wells results in higher production capacities for the wells.
- Due to the new transmission line, an average estimated energy savings of approximately 5% is anticipated for these wells during the months of June through September. During low demand periods, multiple wells are not likely to operate, and the cost savings would be less.

## Calculated Energy Savings

- The WaterCAD model was used to calculate the cost per MG for a well based on discharge pressures, suction pressures, and flow. Because modified pump curves (to reflect both the drawdown and pump curve) are used, only the difference in cost per MG for the wells is compared. Costs were calculated assuming \$0.07/KW\*Hr.
- For the period of June through September an estimated annual combined cost savings for these wells of at least \$4660 would be realized (refer to spreadsheet for date and table below for calculations). Over a 40 year period, this savings would amount to approximately \$186,400.

Potential Annual Energy Savings:	Well	Savings per MG*	MG/Summer	\$Savings/Summer
	6	\$ 3.92	318	\$ 1,248
	11	\$ 7.95	351	\$ 2,788
	13	\$ 4.59	136	\$ 623
	<b>Total/Yr.</b>		<b>805</b>	<b>\$ 4,660</b>

\*Based on computer model output. Assumes \$0.07/KW\*Hr.

## Conclusion

- Energy cost savings of at least \$186,400 will be realized over the 40-year life of the new transmission line, with additional cost savings possible depending on well operation; it is also anticipated that a portion of the 19% current water loss will be recovered by reduced line pressure when the new transmission line is commissioned.
- Additional benefits include reductions in unnecessary pumping and operation and maintenance expenditures, and eliminating potential health hazards associated with waterborne pathogens entering the water distribution system.
- **GPR Costs:** 13,812 foot transmission line = \$1,640,000
- **GPR Justification:**
  - The project is Business Case GPR-eligible (Water Efficient) per 2.4-3: *Efficient water use...reducing the amount of energy required by a drinking water system...therefore, there are also energy and financial savings*; also per 2.4-4: *Proper water infrastructure management should address where water losses could be occurring in the system and fix or avert them*; also per 2.5-2: *Distribution pipe replacement ...to reduce water*

*loss and prevent water main breaks; also (Energy Efficiency) Business Case GPR per 3.5-1: Energy efficient...upgrades; and, per 3.5-5: Projects that achieve the remaining increments of energy efficiency.*

## Mountain Home Well Data

### Well 6

Day	Jun-10	Jul-10	Aug-10	Sep-10
1	Repairs	Repairs	2,853,000	2,158,000
2	Repairs	Repairs	2,841,000	1,946,000
3	Repairs	Repairs	2,931,000	2,079,000
4	Repairs	Repairs	3,050,000	2,082,000
5	Repairs	Repairs	2,830,000	1,725,000
6	Repairs	Repairs	2,989,000	1,636,000
7	Repairs	Repairs	2,752,000	2,214,000
8	Repairs	Repairs	2,988,000	1,621,000
9	Repairs	Repairs	3,229,000	1,958,000
10	Repairs	Repairs	2,866,000	1,329,000
11	Repairs	Repairs	3,501,000	1,512,000
12	Repairs	Repairs	2,128,000	1,605,000
13	Repairs	Repairs	2,929,000	1,909,000
14	Repairs	Repairs	2,953,000	1,858,000
15	Repairs	2,630,000	1,961,000	1,820,000
16	Repairs	3,165,000	2,993,000	1,746,000
17	Repairs	2,407,000	2,752,000	1,580,000
18	Repairs	3,400,000	1,646,000	2,057,000
19	Repairs	2,929,000	3,097,000	1,387,000
20	Repairs	2,700,000	2,698,000	1,659,000
21	Repairs	3,339,000	3,088,000	1,551,000
22	Repairs	2,122,000	2,678,000	1,562,000
23	Repairs	3,140,000	3,004,000	1,518,000
24	Repairs	2,879,000	2,773,000	1,622,000
25	Repairs	2,992,000	2,940,000	1,635,000
26	Repairs	3,287,000	2,773,000	1,517,000
27	Repairs	2,610,000	2,811,000	1,310,000
28	Repairs	2,979,000	1,610,000	1,690,000
29	Repairs	2,929,000	1,788,000	1,489,000
30	Repairs	3,010,000	1,630,000	1,632,000
31	Repairs	3,024,000	1,940,000	

### Well 11

Jun-10	Jul-10	Aug-10	Sep-10
2,906,000	3,299,000	2,831,000	2,712,000
2,565,000	3,391,000	2,929,000	3,028,000
2,474,000	3,341,000	3,347,000	3,323,000
2,448,000	2,417,000	3,042,000	3,108,000
2,286,000	2,788,000	3,893,000	3,180,000
2,261,000	2,807,000	2,767,000	3,024,000
2,377,000	1,346,000	3,196,000	3,545,000
2,691,500	905,000	3,401,000	2,972,000
2,691,500	1,591,000	3,646,000	3,368,000
2,888,000	2,035,000	2,812,000	2,521,000
2,439,000	1,949,000	3,303,000	3,024,000
2,995,000	3,100,000	2,205,000	2,920,000
3,463,000	3,199,000	2,346,000	3,747,000
3,441,000	3,409,000	2,874,000	2,894,000
3,403,000	3,174,000	3,148,000	3,249,000
3,236,000	3,344,000	3,354,000	2,906,000
2,982,000	3,015,000	2,991,000	3,155,000
3,425,000	1,883,000	3,483,000	3,063,000
3,345,000	815,000	3,176,000	2,978,000
3,547,000	1,607,000	2,354,000	3,255,000
3,269,000	1,697,000	3,556,000	3,145,000
5,444,000	489,000	3,003,000	2,930,000
1,393,000	1,706,000	2,947,000	2,885,000
3,044,000	882,000	3,052,000	2,990,000
3,138,000	964,000	3,364,000	3,272,000
3,016,000	1,236,000	3,201,000	3,283,000
3,545,000	2,840,000	3,474,000	3,115,000
2,238,000	2,892,000	3,760,000	3,354,000
2,871,000	3,462,000	2,897,000	3,094,000
3,406,000	3,203,000	2,843,000	3,209,000
	3,238,000	3,050,000	

### Well 13

Jun-10	Jul-10	Aug-10	Sep-10
222,000	1,902,000	327,000	1,025,000
500,000	1,825,000	525,000	666,000
0	1,972,000	1,229,000	47,000
240,000	1,168,000	637,000	851,000
0	1,390,000	1,265,000	729,000
0	173,000	1,223,000	876,000
0	4,538,000	1,150,000	900,000
0	2,378,000	1,060,000	476,000
250,000	3,000,000	1,139,000	105,000
0	2,695,000	506,000	322,000
375,000	2,929,000	1,361,000	585,000
0	1,315,000	925,000	350,000
234,000	1,703,000	1,160,000	679,000
1,270,000	2,407,000	1,105,000	634,000
1,293,000	1,836,000	1,024,000	216,000
838,000	1,786,000	1,374,000	764,000
859,000	1,128,000	1,551,000	509,000
1,306,000	2,747,000	1,398,000	464,000
1,590,000	2,584,000	1,178,000	321,000
1,964,000	2,116,000	473,000	556,000
1,170,000	2,969,000	1,233,000	223,000
1,748,000	1,678,000	958,000	490,000
1,496,000	2,671,000	1,102,000	259,000
1,682,000	1,953,000	1,268,000	523,000
1,731,000	2,273,000	758,000	211,000
1,694,000	2,577,000	1,384,000	292,000
2,336,000	1,707,000	541,000	449,000
2,463,000	610,000	619,000	218,000
2,534,000	964,000	544,000	452,000
1,922,000	1,122,000	1,191,000	223,000
	271,000	1,045,000	

Total Est. w/o Repairs      49.542      83.022      51.407

89.228      72.024      96.245      93.249

29.717      60.387      31.253      14.415