Expanded Natural Resources Interim Committee
Mountain Home Working Group

Final Report and Recommendations
Adopted December 6, 2004

INTRODUCTION

The Mountain Home Working Group has met on a regular basis since April to hear local concerns, discuss ground water conditions, and analyze strategies to address the issues and concerns specific to the Mountain Home area. After conducting the meetings, the Mountain Home Working Group Finds and Recommends as follows:

FINDINGS

1. The Mountain Home ground water budget is not in balance. Annual withdrawals of ground water are exceeding the average annual rate of natural recharge to the groundwater. IDWR studies show an annual deficit of approximately 30,000 acre-feet per year.

2. The regional aquifer is generally described as east of Indian Creek, west of Bennett Creek. The north boundary is below the foothills and the southern boundary is the rim of the Snake River Canyon. Two areas of significant ground water level declines can be geographically defined.

   a. Ground water levels in the regional aquifer have declined as much as 70 feet during the last 35 years in an area roughly encompassing the City of Mountain Home, the Mountain Home Air Force Base, and surrounding agricultural lands.

   b. Ground water levels in the regional aquifer have declined as much as 70 feet during the last 35 years in an area approximately 15 miles northwest of the City of Mountain Home, near Cinder Cone Butte.

   c. There are areas of the Mountain Home Basin where underlying ground water levels in the regional aquifer have not declined significantly.

3. The areas of ground water decline are sufficiently separated by horizontal distance and the parallel direction of ground water flow that withdrawals of ground water from one area do not significantly impact water levels in the other area.

4. Opportunities for recharge or water savings in the Mountain Home Basin are limited.

   a. All surface water in the basin is fully appropriated except for occasional short duration flood water flowing in some of the low elevation, south-facing streams. The volume of water that could be recharged to the regional aquifer by these occasional

flood flows is insignificant when compared to the deficient volume of water in the water budget.

b. Water for recharge or conversion of lands from irrigation with ground water to surface water could be delivered from the South Fork of the Boise River and its tributaries, Bennett Creek, or the Snake River. Very little unappropriated water remains in these streams, however, and any water delivered to the Mountain Home Plateau from these sources for recharge would probably have to be obtained by the acquisition of existing water rights.

c. Some surface water delivery losses could be saved through conservation efforts.

5. **Irrigation** (agricultural/domestic use) is responsible for an estimated 95% of ground water pumping. The number of acres irrigated on the Mountain Home Plateau must be reduced to balance the water budget.

6. Some proposed water uses are presently given preference over other proposed water uses. For instance, the Department of Water Resources will not approve new ground water right permits for irrigation but will approve new water rights for domestic or municipal users. Those seeking to use water for domestic use as defined by Idaho Code § 42-111 may obtain a drilling permit and may appropriate ground water by beneficially using the water without express approval by the Idaho Department of Water Resources.

ISSUES

The working group is particularly concerned about **economic impacts** of balancing the water budget. The working group expects growth in the Mountain Home area, and all recommendations must attempt to minimize negative impacts to the local economy.

Mountain Home Air Force Base contributes significantly to the area economy. With the U.S. Department of Defense in the process of restructuring and closing military bases around the country, it is essential to demonstrate sufficient water availability to satisfy the base's water needs.

Agriculture also contributes significantly to the economy and is a large component of the local tax base. Forced curtailment could impact an estimated 15,000 acres or one-half of the ground water irrigated acres. Drought, declining aquifer levels and rising electrical costs of high lift pumping may mean irrigators can no longer afford to pump. Agricultural users of ground water may be the first user group that cannot afford the cost of pumping water from deeper, declining water levels. Some of these ground water irrigators hold water rights bearing early priority dates. **The prior appropriation doctrine** cannot be compromised or weakened in any way. Water rights should not be made valueless by allowing water level declines to lower below reasonable economic pumping levels.

Holders of water rights for all uses of water must be subject to limitations on further water appropriation and must all participate in and reductions in use, curtailments, or mitigation to prevent such curtailment under the doctrine of prior appropriation.

The following options were discussed during working group meetings:

Agricultural set-aside programs (CREP, EQIP)
Local water projects
Low impact landscaping (and demonstration project)
Bennett Creek water importation
Storage increases in Little Camas and Long Tom Reservoirs
Determine and decrease reach losses in ditches and canals
Increase tunnel capacity
Seal or line canals

RECOMMENDATIONS

These recommendations are formulated from presentations and discussions.

1. Mountain Home Ground Water Advisory Committee. The committee has been meeting for over eight years and a recommended management plan has not been completed. The Working Group recommends that the committee complete and submit to IDWR a recommended management plan within 180 days starting January 1, 2005. The Working group has reviewed an existing draft plan prepared by the committee in 1998, and recommends the committee pursue revision and completion of this plan that is consistent with the following recommendations.

2. The Working Group recommends a net reduction of approximately 30,900 acre-feet per year in ground water withdrawals from the regional aquifer system to balance the water budget. Reductions in ground water withdrawal must be sufficient to arrest, or at least significantly slow the declines in water levels in the regional aquifer

3. The Working Group recommends that the Idaho Department of Water Resources reconsider the boundaries of the Mountain Home Ground Water Management Area and the Cinder Cone Butte Critical Ground Water Area, and redefine the boundaries of a areas for ground water management to match physical evidence of declining ground water levels and areas of water supply.

4. The Working Group recommends legislation that would authorize the creation of an umbrella aquifer management authority with broad authority for inclusion of ground water users, for implementing actions to address water shortages, and for equitably assessing all water users to finance the actions.

5. The Working Group recommends the legislature analyze the existing definition of domestic use in Idaho Code § 42-111 and the associated exclusion from the requirement

to apply for a water right contained in Idaho Code § 42-227 to determine need for revision.

6. The Working Group recommends the Director of the Idaho Department of Water Resources form a water district that includes the ground water rights in the Mountain Home area. While regulation should not be immediately contemplated by the creation, ground water users must measure and report their diversions of water to insure adherence to limitation of the water rights.

7. The Working Group recommends establishment of a Conservation Reserve Enhanced Program (CREP) for the state of Idaho. Some lands irrigated with ground water could be taken out of production through CREP, reducing the financial loss of nonagricultural production.

8. The Working Group recommends adoption of water conservation measures by local governments, including incentives for low water use landscaping.

9. The Working Group recommends the county and city evaluate the benefits of revisions to land use codes. Land use codes may be used to ensure water rights are transferred when lands are annexed. Revisions to land use codes could also restrict development of large lot acreage that may ultimately be irrigated illegally with ground water.

10. The Working Group recommends a one-time budget request in the amount of $100,000 to IDWR for installation of dedicated monitoring wells. Dedicated monitoring wells provide valuable and accurate data for evaluating the aquifer conditions and changes. Current monitoring network depends on existing wells that were drilled for various uses. Dedicated monitoring wells at key locations would add important data to the network. To obtain such wells, they would need to be installed at selected locations. Estimated cost for installing monitoring wells is $25-30 per foot; estimated cost for pressure transducer monitoring equipment is $1500. Estimated cost for a 600-foot monitoring well, with monitoring equipment would be $15,000-18,000. It is recommended that 5 wells be installed, with a total estimated cost of $75,000-$90,000.

11. The Working Group evaluated several projects during the course of meeting. A description and evaluation of these projects is attached at Appendix I. The Working Group recommends the following projects:

a. Conservation Reserve Enhancement Program (CREP)
b. Little Camas Canal PAM Study

Additional details about the projects, cost estimates, and cost comparisons can be found in Appendix I.

Appendix I

Mountain Home Basin Water Management Alternatives

1.0 Conservation Reserve Enhancement Program

The Conservation Reserve Enhancement Program (CREP) is envisioned to be part of a larger effort to reduce ground water use so that aquifer levels, spring flows, and reach gains to the Snake River are stabilized or increased. Although developed primarily for the Eastern Snake Plain Aquifer, Elmore County is also eligible for CREP. CREP is a voluntary land set-aside program, similar to the existing Conservation Reserve Program (CRP) in which the landowner would receive payments to not farm. The payment target is estimated at $118/acre across the program area, with variation based on land value and productivity. A voluntary set-aside program is preferable to involuntary land idlement, either through water right curtailment or through rising pumping costs, because the landowner receives payments, which helps attenuate the economic impacts within the local community. No such payments would exist with involuntary land idlement.

Under the draft program guidelines, 18,415 acres in Elmore County would be eligible for enrollment in CREP. Lands totaling 28,815 acres are irrigated solely with ground water from the Mountain Home Aquifer, while another 5,681 acres utilize ground water from the Mountain Home Aquifer as a supplemental supply (IDWR data). At 2 acre-feet/acre of consumptive use, the maximum amount of water saved through CREP would be 36,830 acre-feet annually, which exceeds the basin water budget deficit of 30,900 acre-feet.

As currently proposed, CREP will require a 20% match from the state. It is anticipated that most of the match will be in-kind costs such as water administration and hydrologic monitoring. However, some part of the match will have to be as cash. It is anticipated that cash portion of the match will come from Ground Water Districts. Ground water users wishing to enroll in CREP that are not part of a ground water district would have to either 1) petition to join an existing ground water district, 2) join together with others and from a new ground water district, or 3) arrange for the cash match to be provided from some other source. No ground water district currently exists in the Mountain Home Aquifer area.

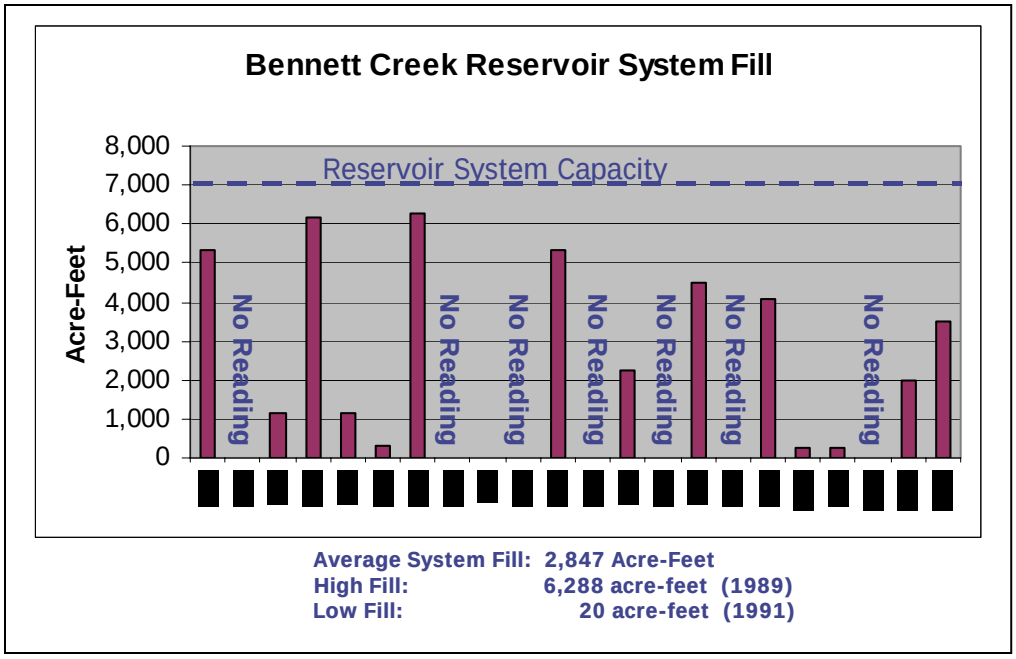
2.0 Bennett Creek Pipeline

The Bennett Creek pipeline would deliver water from the Bennett Creek drainage onto the Mountain Home plateau. This project was evaluated after being proposed by residents of the Mountain Home area. The owners of the Bennett Creek storage reservoirs have indicated they would consider selling the reservoirs for this project. Water delivered through the pipeline would be used to offset ground water pumping from the Mountain Home Aquifer that are either the primary source of irrigation water or a supplemental source for lands located with the Mountain Home Irrigation District. This plan would require the acquisition of storage reservoirs and associated water rights in the Bennett Creek drainage. The water stored in the Bennett Creek reservoirs is authorized for use on 3,585 acres of land along Bennett Creek, but this water supply reliably irrigates somewhat less acreage.

Five small reservoirs are located on Bennett Creek and have a combined storage of approximately 7,121 acre-feet, however the average system fill is 2,847 acre-feet. Based on this data, a pipeline could deliver 10 cfs of constant flow during the irrigation season. If more than 2,847 acre-feet are available for storage, the extra storage would be carried over in the reservoirs for use during subsequent dry years.

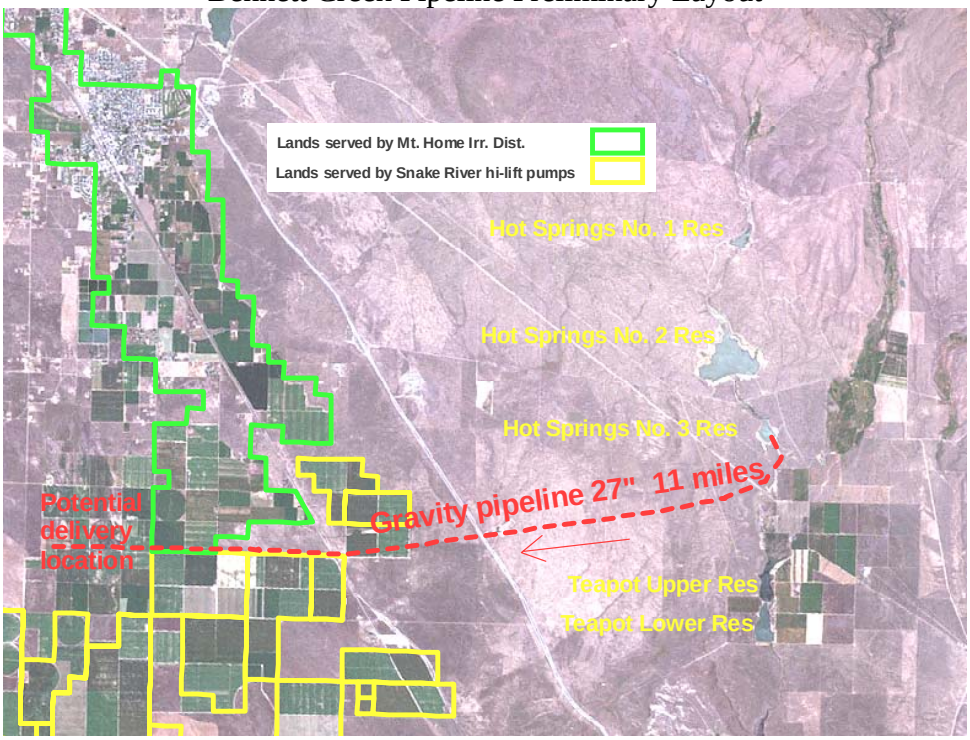
Table X: Bennett Creek Storage Reservoir System

Hot Springs Reservoir	450 acre-feet
Hot Springs Reservoir No. 2	4,880 acre-feet
Hot Springs Reservoir No. 3	553 acre-feet
Teapot Upper Reservoir	427 acre-feet
Teapot Lower Reservoir	814 acre-feet
TOTAL CAPACITY	**7,121 acre-feet**



The pipeline would begin at the Hot Springs Reservoir Number 3 and the termination of the pipe could be at several places on the Mountain Home plateau. For this estimate the termination at the southern boundary of the Mountain Home Irrigation District (Figure 2). This termination point would allow water deliveries to lands in the district and those lands utilizing only ground water for irrigation. The pipeline would be approximately 11 miles in length and have a diameter of 27 inches.

Bennett Creek Pipeline Preliminary Layout



The estimated cost for construction is $2.6 million and annual operation and maintenance is estimated at $10,000. This cost does not include acquisition of the reservoirs or the costs of on farm delivery modifications.

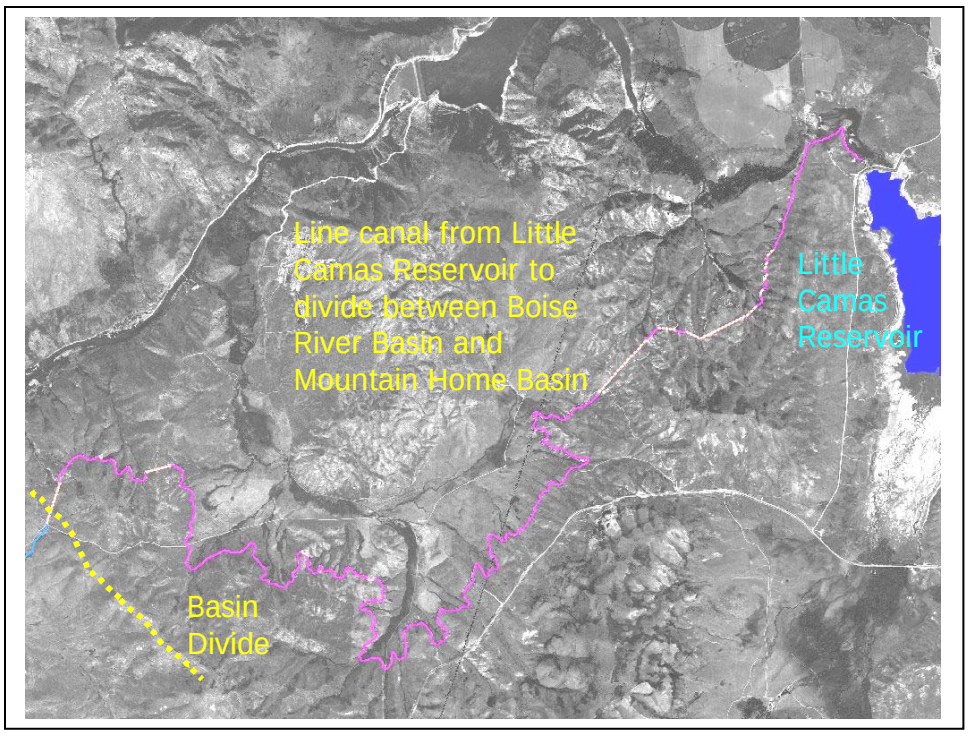
3.0 Little Camas Canal Lining

The Mountain Home Irrigation Districts utilizes three reservoirs for storing and delivering irrigation water onto the Mountain Home plateau. The upper most reservoir is Little Camas Reservoir, located in the Boise River drainage. Little Camas Reservoir has a storage capacity of approximately 22,500 acre-feet, although the average fill is much less, and provides the bulk of irrigation water used by the irrigation district. Approximately 13 miles of canals and tunnels transport water from the reservoir into the East Fork of Long Tom Creek. Water from the Long Tom drainage is stored in Long Tom reservoir. A portion of the water released from Long Tom Reservoir into Big Canyon Creek is diverted into a feeder canal and into Mountain Home Reservoir. Water from Mountain Home Reservoir serves an area south and east of the city of Mountain Home. Water from Big Canyon Creek is also diverted into a canal downstream of the feeder canal and is used to irrigate lands to the north of the city of Mountain Home.

Canal loss through leakage is thought to be significant in the canal from Little Camas Reservoir to the East Fork of Long Tom Creek. This leakage does not enter the

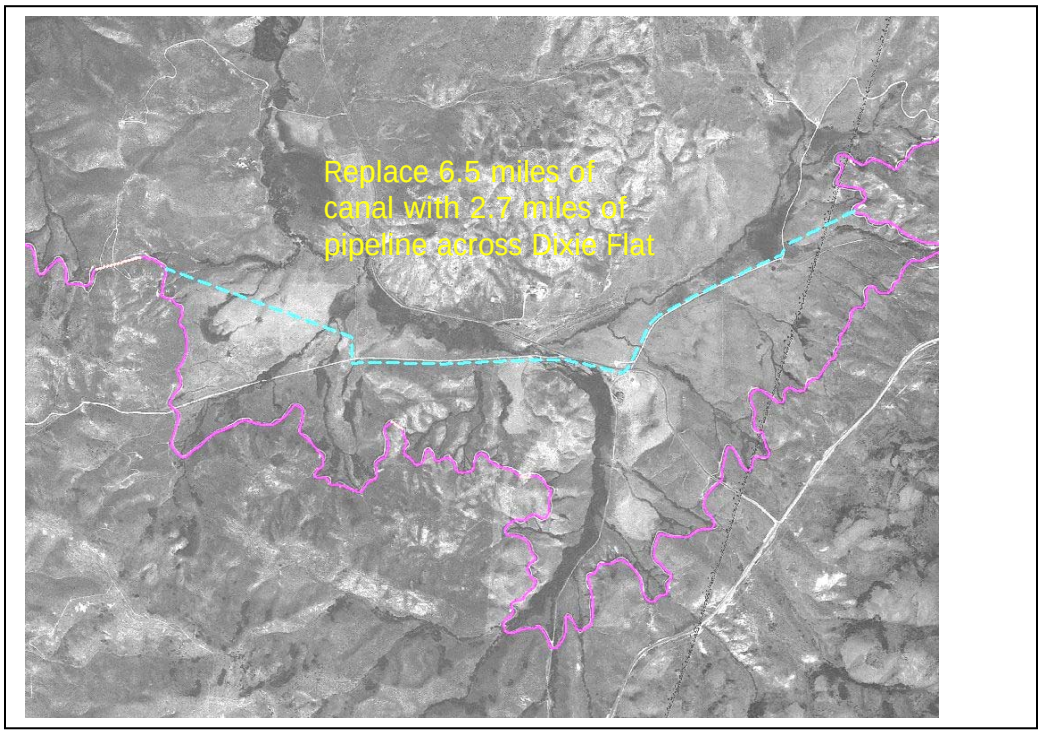
Mountain Home aquifer but is lost into the Boise River drainage. Reduction of leakage from this canal could increase available water supple to the Mountain Home basin. No reliable estimates are currently available on the actual loss within the canal system. Losses are also dependent upon the amount of water in the canal and during the spring and early summer there may actually be water entering the canal from springs and seeps. For the purposes of the cost estimates of proposed alternatives, canal losses are assumed to be 30% of the total releases from Little Camas Reservoir. Canal lining may limit the seeps and springs into the canal that provide additional water during the spring and early summer. Those contributions should be evaluated before undertaking a canal-lining program.

Three structural options were developed for lining or piping portions of the canal to prevent leakage. Option 1 (Figure X) would line the entire canal from Little Camas Reservoir to the basin divide except for those portions located in tunnels. Canal loss from the Mountain Home side of the basin divide accrues to the Mountain Home Aquifer and does not change the mountain Home basin water budget. This would require the lining of about 10.6 miles of canal at an estimated cost of $3.4 million. There is some concern on the part of the irrigation district about the longevity of concrete lining given the potential for frost heave in the area. Any concrete lining would need to take this into consideration but is not be an insurmountable problem with current cold-weather concrete technologies for water control structures.

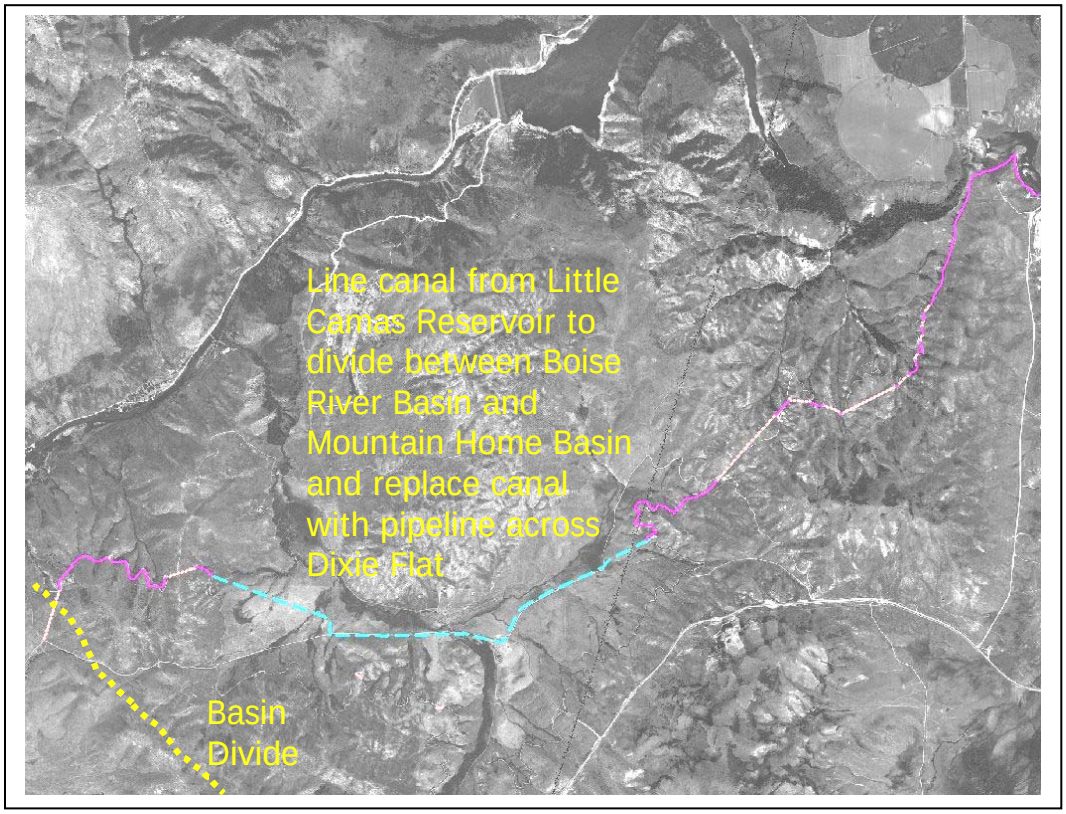


Option 2 would be the installation of a pipeline that would eliminate approximately 6.5 miles of canal and tunnels (Figure X). The pipeline would be approximately 2.7 miles in length and 48 inches in diameter. The cost of the project is estimated at $1.3 million. These costs do not include the cost of rights-of-way or any required NEPA compliance

activity. These options would also require that the existing canal remain in place to collect water during spring snowmelt and runoff from seeps and springs.



Option 3 would be a combination of canal linings and a pipeline that would either line or pipe the entire canal (Figure X). This option would consist of 3.5 miles of canal linings



and 2.7 miles of pipeline. The estimated cost for this project would be $3.4 million. These costs do not include the cost of rights-of-way or any required NEPA compliance activity. These options would also require that the existing canal remain in place to collect water during spring snowmelt and runoff from seeps and springs.

A cost comparison for all structural options can be found in Table X.

3.1 Little Camas Canal PAM Study

As an alternative to structural canal lining, the Mountain Home Irrigation District, in conjunction with the Southwest Idaho Resource Conservation and Development (RC&D) Council and the University of Idaho Research Station in Kimberly, began exploring the use of polyacrylamides (PAM) to prevent canal leakage. The Agricultural Research Service, Bureau of Reclamation and the Natural Resources Conservation Services also have ongoing efforts in Idaho and Colorado to determine is PAM can be used to prevent canal leakage. PAM has been used to prevent erosion on irrigated croplands and new products may help prevent canal leakage. The district first experimented with PAM in 2003 and continued their application through 2004. The irrigation district has spent about $1,700 dollars during the last two irrigation seasons with some additional financial assistance from the Southwest Idaho RC&D council.

In an attempt to quantify the effectiveness of PAM, the irrigation district has only treated the last three (3) miles of the canal. The hope was to compare treated and non-treated sections of the canal to determine leakage. The application of PAM is believed to provide some benefit for the irrigation district but quantifying those benefits have proven difficult. Measuring devices with the required accuracy to determine flow in the canals are lacking. The district did establish some rated staff gages but heavy moss growth within the canal resulted in unreliable readings. The situation is complicated because de-mossing agents cannot be used with PAM. There are also questions concerning the longevity of PAM treatments.

The Mountain Home Irrigation District would like to determine the effectiveness of PAM in preventing canal leakage. If PAM can reduce canal loss at reasonable costs the district would like to incorporate its use into its operations. In order to incorporate the use of PAM the district may be required to increase assessments to members of the district. Before that can be done, the district needs to insure that PAM can prevent canal leakage and provide additional water for members of the district. In discussions with personnel from the Idaho Department of Water Resources the district feels that a five-year research program is needed to determine if PAM is effective in the Little Camas canal. The district believes that within a five-year period the canal system should experience at least one year with sufficient water to run the entire irrigation season. This is probably a prerequisite to determine the water savings and resulting carry over for the subsequent irrigation season.

The implementation of this plan will require financial assistance for the installation of measuring devices on the canal including a parshall flume at the outflow from the Little Camas Dam and in canal measuring devices that would not be impacted by moss growth.

The measuring devices would be automated to provide for continuous recording of flows. Financial assistance would also be required to contract with a reputable entity to carry out research phase of the project and to purchase the required PAM products. Table X provides a cost estimate for the project.

Table X: Estimated cost for determining the effectiveness of PAM for conserving water in the Little Camas Canal.

Item	Cost
Parshall Flume	$10,000
Additional Measuring Devices	$5,000
Funding for PAM Evaluation	$50,000
Total	$65,000

4.0 Managed Aquifer Recharge

Managed aquifer recharge can be used in some situations to enhance ground water supplies within a basin. A preliminary review of the Mountain Home basin indicates that aquifer recharge may not be a viable alternative. A small recharge test was conducted in 1999 at a gravel pit north of the City of Mountain Home. Total volume diverted was estimated at 1,000 acre-feet. Monitoring in eight nearby wells prior to and after the recharge occurred showed no response to the recharge.

Water budgets for the Mountain Home aquifer indicate an approximately 31,000 acre-foot deficit. This water budget includes water in Big Canyon Creek that is not used for irrigation water. The bulk of that water is recharged naturally through the bed and banks of Big Canyon Creek. Only in very infrequent wet years does any water escape the Mountain Home system to the Snake River. The only way for recharge to be a viable option is if water can economically be imported into the basin within the constraints of existing water rights. If water can be imported to the basin an economic analysis should be conducted to determine if the water should be delivered directly to the water user instead of recharge. As recharge does not appear to be a viable option for the Mountain Home basin, no cost estimates were developed.

5.0 Cost Comparison of Water Management Project Alternatives

The following table provides a cost comparison for the water management projects investigated in the course of the Mountain Home Working Group's study, except for Managed Recharge which does not appear to be a viable option, and the Little Camas Canal PAM study for which the costs are listed in Section 3.1.

Project	**Construction Cost**	**Average Water (acre-feet)**	**Annual Bonded Cost** (1)	**Annual O&M**	**Total Annualized Cost**	**Total Annualized Cost per Acre-Foot**
Bennett Creek Pipeline	$2,600,000	2,847	$188,760	$10,000	$198,760	$70
Little Camas Canal Option 1	$3,400,000	3,665	$126,840	$5,000	$251,840	$69
Little Camas Canal Option 2	$1,300,000	2,585	$94,380	$5,000	$99,380	$38
Little Camas Canal Option 3	$3,400,000	3,790	$246,840	$9,000	$255,840	$68
	Acres Eligible	**Average Water (acre-feet)** (2)	**Annual Program Cost** (3)	**Annual Cost per Acre-Foot**	**Annual State/Local program Cost (20% of total)**	**Annual State/Local Cost per Acre-Foot**
Conservation Reserve Enhancement Program (CREP)	18,415	36,830	$2,172,970	$59	$434,600	$12

Notes:

(1) Assumes Idaho Water Resource Board-issued revenue bonds with 30-year term and all-inclusive rate of 6%.

(2) CREP water is maximum based on all eligible acreage being enrolled and consumptive use of 2 AF/acre.

(3) Annual program cost uses current estimated target of $118/acre across the program area. The Mountain Home area may be lower.