TITLE PAGE

WaterSMART: Water and Energy Efficiency Grant Program

PROJECT TITLE:

Fort Shaw Irrigation District
Conversion to Pipeline Water Efficiency Project

APPLICANT:

Fort Shaw Irrigation District
P.O. Box 154
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PROJECT MANAGER

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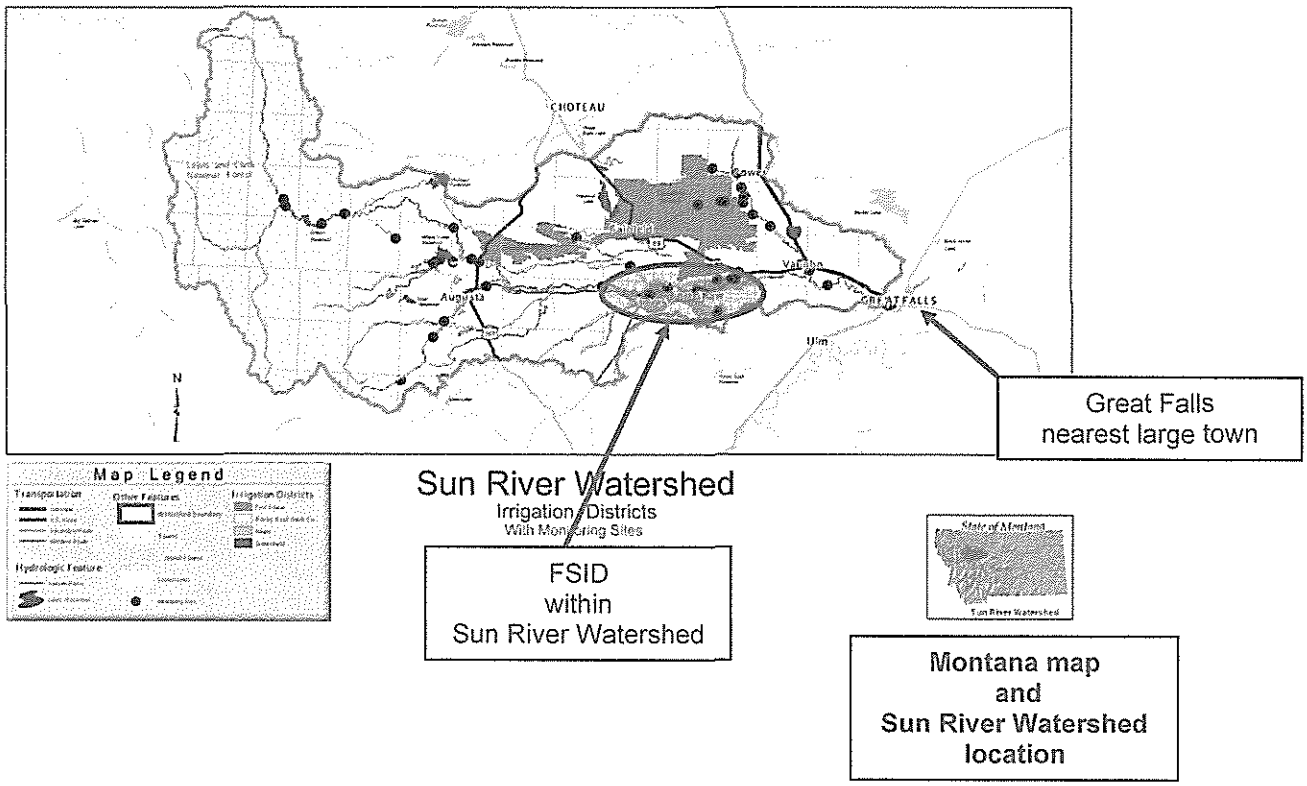
(1) Executive Summary

- **Date**: January 20, 2015
- **Applicant**: Fort Shaw Irrigation District
- **City**: Fort Shaw
- **County**: Cascade
- **State**: Montana

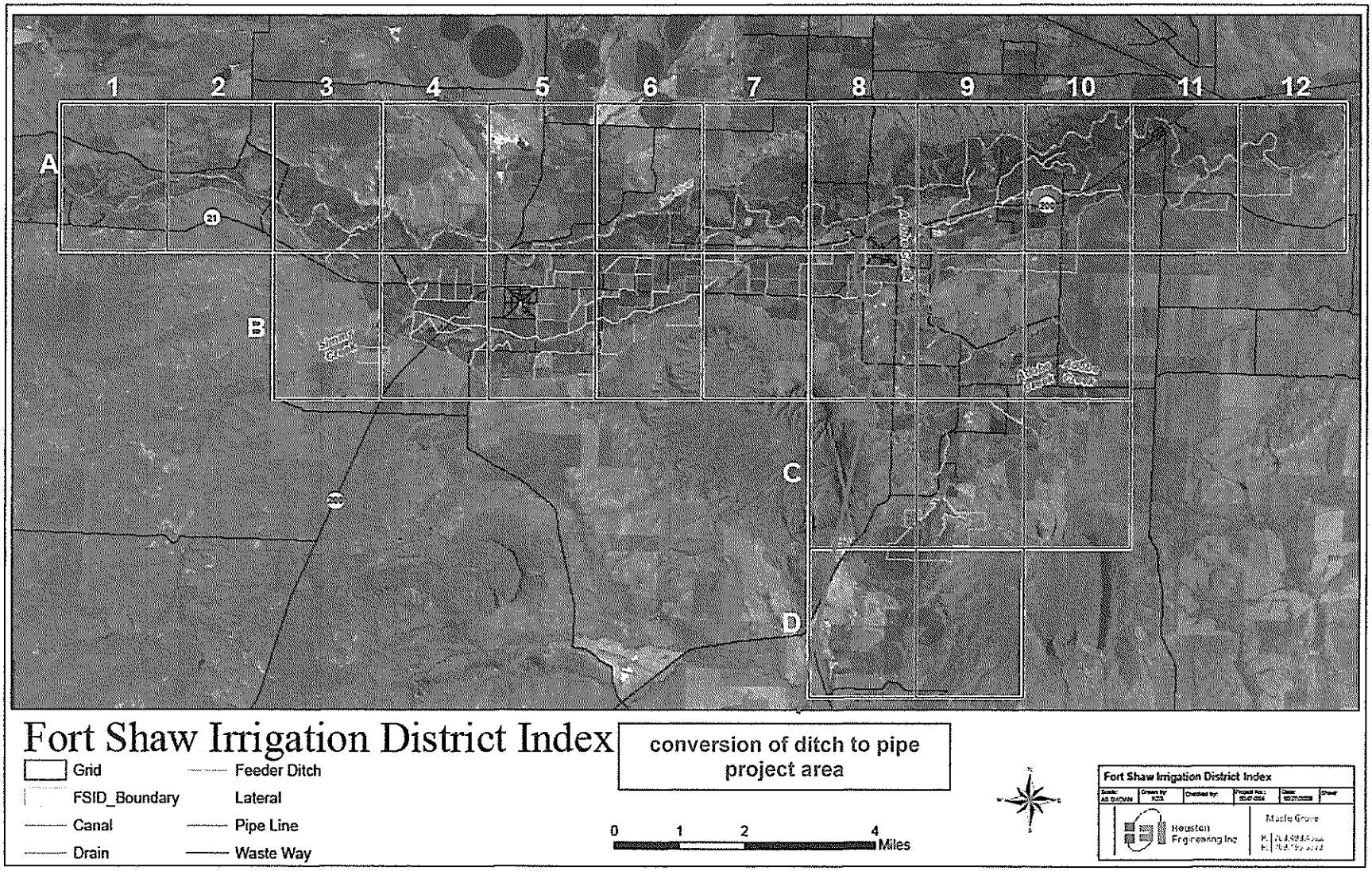
- **Project summary:**
  The Fort Shaw Irrigation District (FSID or District) is an aging Bureau of Reclamation (BoR) facility with many needs that will be addressed in this proposal. The project proposal will take the most antiquated and wasteful delivery systems and upgrade them to improve water efficiency while improving instream flows in the Sun River. The water savings will be 13 additional cfs (5,460 acre-feet) over the summer to the Sun River, which has recently gone dry below the District's headworks on numerous occasions over the past ten years. Grant funds will be used to complete final engineering design and buy 10,420 feet of PVC pipe/accessroies to bury in the existing very leaky open canal delivery system.
- **Project length**: two years
- **Estimated completion:** June 30, 2017
- **Federal facility:** Yes, Bureau of Reclamation owned

(2) Background Data

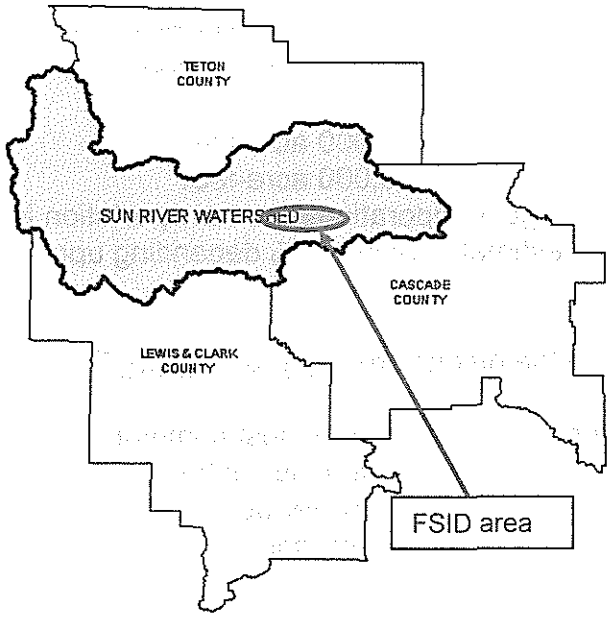
- ***Geographic location - state and watershed map:***



Fort Shaw Irrigation District's map



Sun River Watershed/County Boundary Map



The Fort Shaw Irrigation District (FSID or District) is located 20 miles northwest of Great Falls, Montana, and involves the irrigation of agricultural crops (wheat, barley, alfalfa and grass) on more than 11,000 acres on 177 small farms growing small grains and alfalfa. The irrigation project was originally completed in 1908 with a small rehabilitation program completed in 1961.

In 1982, the Bureau of Reclamation (BoR) reviewed the District's infrastructure status that identified many areas in immediate need of repair to enhance the District's efficiencies. An important part of that report listed the opportunity to improve the delivery system by converting open ditches to pipelines to improving water management. Because of the small size of the district and low net return from the crops, improvements to the project in the past have been minimal.

Water is supplied to the project from the Sun River to the Fort Shaw Canal, utilizing a rock overflow dam as a diversion structure. The water flows from the river by gravity through the main canal and into the distribution system. The Fort Shaw canal is 16 miles in length and distribution laterals total 85 miles in length. The canal capacity is 225 cfs.

As the water diverted from the Sun River makes its way across the project, project inefficiencies and major seeps in the canals have an estimated total district efficiency of only 46% as identified from a 1982 BoR review. This loss is readily noticed in the loss of acreage from the boggy areas and areas with high salinity. This loss of delivery water impacts the small farmers, fisheries, wildlife and recreation in the area.

Willow Creek Dam and Reservoir with 32,000 acre-feet storage is the only facility for the District to supplement the Sun River stream flows as needed. This reservoir can be

critical to the water supplies of the district during dry years. The Greenfields Irrigation District of the Sun River project operates the reservoir.

A hydromet station at the headworks measures all inflows to the district. Water measurement devices have also been installed at three other key locations. Water Inventory Data Estimation:

- Diverted from Sun River = 45,000 acre-feet
- Delivered to farm units = 20,000 acre-feet
- Operation spills, seepage, evaporation, and transportation losses = 25,000 acre-feet
- On-farm efficiency is estimated at 50-75% depending upon soils and type of irrigation

All assessed lands within the district are taxed $19.50 for 2 acre/feet.

Gravity irrigation with contour ditches is the most common method of irrigation used in the area. Pumping water to through gated pipe is fast becoming a common tool for many farm operations which has saved water but increased operational costs. Several pivots have been installed recently as a means to increase efficiency. Some irrigators are evaluating gravity sprinkler systems as a possible alternative.

Soils throughout the irrigation district vary significantly. Those in the alluvial valley floor have medium to heavy textures and are underlain with sands and gravels. The old river terraces adjacent to the alluvium have medium gravelly-textured profiles. Soils adjacent to Shaw and Square Buttes are composed of silty clay loams and clay loams underlain by shale and sandstone parent materials. Drainage is a problem in the areas with heavier soils with some of the land having gone out of production.

Past twelve years of improvements working with BoR and many other watershed partners include:

- 1998 - Hydromet station at headworks and three key sites on main canal
- 1999 - Headwork gates automated allow for remote monitoring and operation
- 2000-2010 - Canal lining with "canal lining" on 6,000 feet of main canal
- 2000- 2010 - Replacement of 35 farm turnouts with larger size and that allow for measurements
- 2000-2010 - Replaced 2,000 feet of open canal with PVC piped system
- 2002 - Installed a ¾ mile pipeline that replaced 5 miles of open canal
- 2011 - Have replaced over 2,000 feet of open canal with PVC piped system and in the process of changing an additional 3,000 feet of canal with PVC.
- 2014 - Gravity pipeline installed to conserve water and energy

BoR in each of these projects assisted District in design, NEPA review, and project oversight.

Operation and Maintenance Program - Since the District has very limited funds, past attempts to incorporate some of the BoR ideas have not taken place. Even previous grants with matching loan requirements were limited due to funding. Starting in 1997, in cooperation with local, state and federal grants and in-kind assistance, the district started

an ambitious water conservation and management program. This has included the automation of the headworks, water measurement at several key locations, canal lining, a siphon to eliminate five miles of canal, landowner education programs, district board education programs and district staff education programs. The result has been a savings of 20,000 acre-feet of water annually that has been utilized to improve Sun River flows and sustain the district to meet the demands of its producers in the ongoing droughts of this region.

Water shortages in the District are frequent primarily because of infrastructure bottlenecks that cause many farmers to be shorted during crucial crop growing season. Although the District does experience some drought related water shortages, teamwork in the Sun River Watershed has reduced the frequency of that problem. Converting as many open ditched to closed pipe systems will assist the District in fulfilling most on-farm shortages/demands.

(3) Technical Project Description

The overall goal of this project is to conserve energy and improve the irrigation efficiency of the District to benefit the entire Sun River Watershed. This will be accomplished by replacing 10,420 feet of open ditch with pipeline system, conserving water and reducing losses so they may be utilized for reuse by the irrigation district in water short years, save water for the basin to allow more water for fisheries, businesses and drinking. Water savings was calculated by using current delivery of 9,660 acre-feet through this part of the canal system for 840 acres that will be reduced to 4,200 acre-feet in a closed pipe system. Specifically, the District will:

Objective 1 - Improve irrigation efficiency of District by 10% (5,460 acre/feet savings)

Task 1 - Bureau of Reclamation complete NEPA and NHPA — Aug - Oct 2015
- Bureau of Reclamation with District assistance will complete a detailed environmental and historic compliance review for the proposed project.

Task 2 - Final engineering, review and certification of design — Oct - Nov 2015
- District and BoR will work closely on final designs of project this major project to meet all state and federal requirements

Task 3 - Install 10,420 feet of PVC pipe — Nov 2015 - Mar 2017
- Solicit and award material bids for PVC pipe
- FSID 3-person crew assist excavator dig trench, place bedding material, lay pipe, and pack around pipe
- FSID excavator digs trench, place bedding material and help pack material
- FSID dozer fills in trench
- FSID 3-person crew hook headgates, farm turnouts, and vents to PVC pipe
- FSID manager oversee construction phase

Task 4 - Reporting, compliance review and monitoring — Aug 2015 - June 2017
- FSID manager bid materials, get permits, track funds, and file reports

- FSID and BoR project compliance review
- FSID test system for successful installation
- SRWG staff monitors water quantity in the Sun River for two years to track project success

Results - Better water management for FSID and water savings of approximately 5,460 acre-feet per year which will improve water quantity in the Sun River.

(4) Evaluation Criteria

Evaluation Criterion A: Water Conservation
- Subcriterion No. A.1: Quantifiable Water Savings:

Describe the amount of water saved. *For projects that conserve water, state the estimated amount of water conserved in acre-feet per year that will result as a direct benefit from this project. Please provide sufficient detail supporting the estimate, including all supporting calculations. Please also include the following:*

• *What is the applicant's average annual acre-feet of water supply?*

- 54,000 acre-feet is diverted from Sun River
- 20,000 acre-feet is delivered to farms

• *Where is that water currently going (i.e., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?*

- 34,000 acre-feet is spills, seepage, evaporation, and transportation losses
  - 15,000 is operational spills into Sun River
  - 19,000 is delivery losses from evaporation and seeps into ground

• *Where will the conserved water go?*

- 5,460 acre-feet will be conserved from improved water management with savings to be left in the Sun River increasing summer flows by approximately 13 cfs. This 13 cfs is crucial when current river flows reach as low as 30 cfs, which is almost half of the desired bare minimum flows of 50 cfs that the watershed partners are trying to maintain. See attachment #6 on pages 33 and 34 for past Sun River flow data and why increased flows needed.

(1) Canal lining/piping: *Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address the following:*

(a) How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.

Water is measured as it enters this part of the District delivery system with 9,660 acre-feet measured by weirs. The District then measures only 4,200 acre-feet at farm turnouts to track actual water delivered to the 17 farm units covering 840 acres. Annual loss of 5,460 acre-feet. Each irrigation season daily delivery records documenting these measurements are maintained at the District office.

(b) How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.

The canal seepage losses have been determined as identified in section (1) (a) above with actual daily weir measurements entering these canals and actual water delivered to the farm unit by measuring at farm turnouts. The difference between water entering the system to what was delivered to farm units equal canal loss.

So do not have any "representative data/measurements to provide. Only daily flow measurements with data too large to supply in this proposal.

(c) What are the expected post-project seepage/leakage losses and how were these estimates determined (e.g., can data specific to the type of material being used in the project be provided)?

No post-project seepage/losses will need to be estimated since this will be a closed pipe system. All water entering the system/pipe will be delivered to the farm units.

(d) What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?

No annual transit loss will need to be calculated since this will be a closed pipe system. All water entering the system/pipe will be delivered to the farm units.

(e) How will actual canal loss seepage reductions be verified?

Pre-project canal losses will be verified by post-project measuring water entering the pipelines to each farm unit/turnout.

(f) Include a detailed description of the materials being used.

Materials to be used will be 18 inch class 80 PVC pipe with necessary tees and elbows to get from each canal system entry point to each farm unit turnout. A gravel bedding material will be compacted under and beside the PVC pipe.

- Subcriterion No. A. 2: Percentage of Total Supply:

- ***Provide the percentage of total water supply conserved:*** *State the applicant's total average annual water supply in acre-feet. Explain how this calculation was made.*

  - 54,000 acre-feet is diverted over the entire irrigation season that is measured in the canal just below the headworks where water is diverted from the Sun River.
  - 20,000 acre-feet delivered to the farms is total measured to all farm turnouts.

Percentage of total Water supply conserved:

$$\frac{\text{Estimated Amount of Water Conserved} = 5{,}460 \text{ acre-feet}}{\text{Average Annual Water Supply} = 54{,}000 \text{ acre-feet}} = \mathbf{10\%}$$

Evaluation Criterion B: Energy-Water Nexus

- Not applicable to this project

Evaluation Criterion C: Benefits to Endangered Species

- Not applicable to this project

Evaluation Criterion D: Water Marketing

- The water conserved will not be marketed to other users but will be part of a team effort to better share this limited resource in the water-short basin.

Evaluation Criterion E: Other Contributions to Water Supply Sustainability
Subcriterion E. 1: Addressing Adaptation Strategies in a WaterSMART Basin Study

- *Identify the specific WaterSMART Basin Study where this adaptation strategy was developed. Describe in detail the adaptation strategy that will be implemented through this WaterSMART Grant project, and how the proposed WaterSMART Grant project would help implement the adaptation strategy.*

The Sun River Watershed is where the basin study was developed for this adaptation strategy. In 2009, Reclamation, in consultation with the Sun River Watershed Group (SWRG), initiated the Sun River Special Study. The Special Study is an inventory and analysis of proposed measures that could be implemented to improve streamflow in the Sun River while maintaining or improving irrigated agriculture production. The study identifies a procedure by which water savings can be allocated between improved streamflow in the Sun

River and irrigation needs. Although the purpose of the Special Study was not to fund projects, it does identify steps that can be taken towards implementing projects. This study was completed in September 2012.

This project will help implement the adaptation strategy by completing a true win-win project that improves irrigation efficiency for the District while allowing water savings to remain in the Sun River.

- *Describe how the adaptation strategy and proposed WaterSMART Grant project will address the imbalance between water supply and demand identified by the Basin Study.*

The adaptation strategy and this proposed WaterSMART grant will address the imbalance between water supply and demand by sharing the limited water supply between agriculture purposes and instream flows. The instream shortage is shown on attachment 6 on pages 33 and 34.

- *Identify the applicant's level of involvement in the Basin Study (e.g., cost-share partner, participating stakeholder, etc.).*

The District was one of 15 partners who participated in this Basin Study. The District committed hundreds of in-kind manhours to assist develop the baseline data, possible projects, project evaluations and possible solutions. Since that strategy was developed the District has already spent over $500,000 of in-kind resources implementing projects to help meet the Basin Study objectives of finding win-win solutions to water shortages.

- *Describe whether the project will result in further collaboration among Basin Study partners.*

This project will result in further collaboration among Basin partners by showing the District is serious to finding win-win solutions to the complex water shortage issues. The SRWG and District continue to work together and with other partners to implement other beneficial projects as reported during a recent watershed tour. Projects funded by Coke-Cola and BoR were highlighted in this tour. See tour press coverage on attachment #10, page 43.

Subcriterion E.2: Expediting Future On-Farm Irrigation Improvements

- *Include a detailed listing of the fields and acreage that may be improved in the future.*

  There will be 17 fields totaling 840 flood-irrigated acres that will benefit by this project.

- *Describe in detail the on-farm improvements that can be made as a result of this project. Include discussion of any planned or ongoing efforts by farmers/ranchers that receive water from the applicant.*

  These farmers are planning on improving their on-farm irrigation practices in approximately four years. The delay is because they are currently completing other projects that are benefitting other on-farm irrigation practices.

- *Provide a detailed explanation of how the proposed WaterSMART Grant project would help to expedite such on-farm efficiency improvements.*

  This WaterSMART grant will help expedite the on-farm improvements by guaranteeing a consistent flow to each farm turnout. These farmers are currently reluctant to install water conservation/irrigation improvements when they cannot depend upon consistent/even flows delivered to new pivots.

- *Fully describe the on-farm water conservation or water use efficiency benefits that would result from the enabled on-farm component of this project. Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.*

  On-farm conservation measures will be conversion from flood irrigation to pivots. This will result in less water demand and contaminated field water runoff into the Sun River. Current 840 acres on-farm flood irrigation demand is 3 acre-feet per acre totaling 2,520 acre-feet. Conversion to pivot irrigation will require only 1.5 acres-feet per acre for total of 1,260 acre-feet. This estimated improvement has been proven over many years when using a PVC pipe to deliver water directly to the pivot.

- *Projects that include significant on-farm irrigation improvements should demonstrate the eligibility, commitment, and number or percentage of shareholders who plan to participate in any available NRCS funding programs. Applicants should provide letters of intent from farmers/ranchers in the affected project areas.*

  All five producers farming the 840 acres plan on converting from flood to pivot but because of economic unknowns will not provide letters of commitment that they feel may not be possible if crop prices dive below net-cash returns allowing for infrastructure improvements, as seen in recent years.

- *Describe the extent to which this project complements an existing NRCS-funded project or a project that either has been submitted or will be submitted to NRCS for funding.*

  There is no existing or soon to be submitted NRCS funded projects at this time. These landowners need to complete their existing projects first.

Subcriterion E.3: Building Drought Resiliency

- *Explain in detail the existing or recent drought conditions in the project area. Describe the severity and duration of drought conditions in the project area. Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by drought.*

The Sun River has on frequent occasions entered a drought condition that has caused irrigators in the entire Sun River Watershed to shut down earlier than normal. The Recent Sun River Watershed water management evaluation helped define shortages and options on how to find win-win solutions for both the river and irrigated agriculture. The instream shortage is shown on attachment 6 on pages 33 and 34.

- *Describe the impacts that are occurring now or are expected to occur as a result of drought conditions. Provide a detailed explanation of how the proposed WaterSMART Grant project will improve the reliability of water supplies during times of drought. For example, will the proposed project prevent the loss of permanent crops and/or minimize economic losses from drought conditions? Will the project improve the reliability of water supplies for people, agriculture, and/or the environment during times of drought? Please note that all proposed projects must meet the project eligibility requirements described in Section III.B. of this FOA. In accordance with those requirements, project proposals requesting compensation for economic losses resulting from drought, and proposals for the purchase of water are not eligible for funding under this program. Please see Section III.B. of this FOA for a detailed description of the types of projects eligible for funding.*

This specific project will reduce impacts to the river during drought conditions by improving instream flows in every year. During drought years the instream flows will dip because of senior water rights status BUT the project will help improve sharing water between all water users. At least all water users can say they are trying to increase water availability with projects like this one. Even the fisheries proponents are willing to have some of this water saving go towards irrigation to prevent crop losses.

Subcriterion E.4: Other Water Supply Sustainability Benefits

- *Will the project make water available to address a specific concern? For example:*
    - *Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?*

Yes, the project will help resolve competition with other users. Any water saved that will be available for fisheries and growth results in a win-win condition.

o Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by climate variation.

The Sun River Watershed water rights are over three times average available water supply using known state water right records. The water conflict for this limited water supply becomes even more heightened in drought years which have been fairly frequent in the past ten years. In the past ten years the snowmelt and in-turn water runoff has been coming off sooner due to climate change making it less available for the irrigators and the aquatic life. Any water savings like this project that is beneficial for the District and the river need to be installed as soon as possible to help reduce water wars.

Through contracted assistance the SRWG has documented changes to runoff timing and amounts. These reports are available upon request but are too lengthy to attach.

o Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved?

The project will resolve a conflict between water users within District boundaries because of infrastructure shortages. Also, projects like this are making all water users feel the Sun River will be able to meet everyone's needs in the future in an ever changing world.

- *Will the project make additional water available for Indian tribes?*
  No.

- *Will the project make water available for rural or economically disadvantaged communities?*

  No. But will help with long-term, big picture water savings in the basin.

- *Does the project promote and encourage collaboration among parties?*

  o Is there widespread support for the project?

  Yes, there is widespread support for the project. The SRWG is comprised of over 40 organizations in favor of projects like this one. See SRWG letter of support and commitment on attachment #2 page 29.

o What is the significance of the collaboration/support?

When the SRWG was formed 15 years ago the area was in turmoil with irrigators fighting irrigators and irrigators fighting recreationists over the limited supply of this very important resource. Through hard-work and MANY meetings, the SRWG partners now work on solutions rather than pollution. To keep this team effort moving forward, the Sun River Watershed Group is pursuing water saving projects like this one to reduce the annual water demands so the extra water can be shared for instream flows and be available during drought years for irrigation.

o Will the project help to prevent a water-related crisis or conflict?

Yes, the project will help divert a water related crisis in this watershed. Even though the SRWG has brought people together to solve local problems through local solutions there is a long ways to go. Getting this segment of the river to above 50 cfs is just the first step in meeting the water demands (see attachment #6 on pages 33 and 34 for past Sun River flow data. This data shows changes over past few years). If there is going to be a healthy fisheries, the flow in the river must be raised to 130 cfs. This and many other projects being pursued will help reach that goal and reduce the chance of a fragile relationship between water users from failing.

o Is there frequently tension or litigation over water in the basin?

Yes, there is tension over water in the Sun River Basin. That is just a fact of life when water is so important for so many uses. Every year there is a potential of loosing this team approach to solving water problems because of water shortages. Thankfully, the team knows each other well enough to know there can and will be some setbacks but they must be kept to a minimum.

- *Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

Yes, there is the possibility of future water conservation improvements by other water users of this project is completed. There are several other partners in the watershed working right now to put together beneficial projects. These partners seeing first-hand what is achievable with projects like this one is encouraging to them to pursue funding to complete their own projects.

- *Will the project increase awareness of water and/or energy conservation and efficiency efforts?*

o Will the project serve as an example of water and/or energy conservation and efficiency within a community?

Yes, the project will serve as water conservation within several communities. There are six communities that are looking to the SRWG to guide them in how to resolve their water shortages. Having the District conserve water is an incentive for those communities to save water also.

o Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?

Yes, the project will increase capability for future water conservation by others. As mentioned before, the SRWG is working with many other entities on possible water savings projects in the near future that fit the win-win requirements the SRWG pursues.

o Does the project integrate water and energy components?

No, this specific project does not integrate water and energy but the teamwork to get this project moving forward will help future integration take place.

Evaluation Criterion F: Implementation and Results
- Subcriterion No. F. 1: Project Planning

(1) Identify any district-wide, or system-wide, planning that provides support for the proposed project.

- The District completed a Water Management and Water Conservation Plan on May 13, 2009. The District prepared this plan as a management tool to improve the efficient use of available water, prioritize projects, improve water quality in the Sun River, improve the agricultural economy within the district, and fulfill the water conservation planning requirements stipulated in the Reclamation Reform Act of 1982. On page 15 in the plan, selected conservation measures to improve water management and water savings included this project.

- The SRWG has a watershed workplan that addresses water quality and water quantity issues. Committees work together to find solutions to these complex natural resource issues. The Water Management component of the SRWG workplan includes drought management solutions.

- The project also fits the Sun River Watershed Group's water management efforts as prioritized in a Sun River Special Study which was completed in 2012 and funded by Reclamation. See attachment #9 on page 42 for "Executive Summary" of Sun River Special Study report.

- Montana has a state water plan that can be seen on the web at: http://www.dnrc.mt.gov/wrd/water_mgmt/montana_state_waterplan/default.asp Part II of the plan includes "Subsection: Agriculture Water Use Efficiency". See attachment #8 on page 29. That subsection describes the need to improve

efficiency so agriculture can withstand periods of drought; improve performance of aging irrigation facilities; and improved water quality. This project fits the state plan by accomplishing water conservation as a tool to improve flows in the state waters.

(2) Describe how the project conforms to and meets the goals of any applicable planning efforts, and identify any aspect of the project that implements a feature of an existing water plan(s).

This project will implement 1) District plan components to improve infrastructure to eliminate bottlenecks that cause water shortages to specific fields; 2) SRWG plans to find win-win solutions to water shortages through water conservation to meet the minimum instream flow needs while keeping irrigated agriculture whole; and 3) state water plan of improving teamwork through water conservation.

- Subcriterion No. F.2: Readiness to Proceed

(1) Are all necessary plans/designs complete? Are there any delays expected to result from environmental compliance?

- Initial design is completed but final engineer design work has not been completed but will be easily accomplished within two months of getting green light for the project to begin. The District and BoR have completed several other projects and are fully prepared to easily complete design and environmental compliance review.

- There are not any expected delays from environmental compliance review.

(2) Describe the implementation plan of the proposed project.

- The stages of project implementation include:
  - #1 - BoR work on design, NEPA and NHPA - Aug - Oct 2015
  - # 2 - BoR and District complete final engineering design Oct - Nov 2015
  - # 3 - Install 10,420 feet of PVC pipe - Nov 2015 - Mar 2017
  - # 4 - Reporting, compliance review and monitoring - Aug 2015 - Jun 2017

(3) Explain any permits that will be required and the process for obtaining such permits.

- Permits and the process required to obtain include:
  - No permits will be required for this project.

- Subcriterion No. F. 3: Performance Measures

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon project completion.

- Performance measures to document project benefits include the District comparing water delivered through this system after installing pipeline and the SRWG measuring flows in the Sun River at Simms, which is below FSID diversion point, for two years to comparing prior and post data changes that will occur after pipeline installed. Estimated water savings of approximately 5,460 acre/feet annually will benefit the infrastructure reliability of water for the irrigation district while improving water quantity for all other uses in the basin.

Pre-project: Flow measurements into this system have already been taken to identify potential savings.
Post-project: Gauges on the Sun River, flow measurements on the canal, flow measurements on the wastewater by the District and SRWG will help track all water savings. See attachment #6 on pages 33 and 34 for Sun River flow data.

- Subcriterion No. F. 4: Reasonableness of Costs:
Please include information related to the total project cost, annual acre-feet conserved (or better managed), and the expected life of the improvement. Use the following calculation:

$$\frac{\$606,606}{5,460 \text{ acre-feet} \times 40 \text{ years} = 218,400 \text{ acre-feet}}$$

Relating to a $2.78 per acre-foot cost

- *For all projects involving physical improvements, specify the expected life of the improvement in number of years.*

  - Life expectancy of buried PVC pipe and pivots per NRCS field guide specification is approximately 25 years however past actual experience is closer to 40 years.

Evaluation Criterion G:

$$\frac{\text{Non-Federal Funding} = \$307,740}{\text{Total Project Cost} = \$606,606} = 51\%$$

Evaluation Criterion H: Connection to Reclamation Project Activities

(1) How is the proposed project connected to Reclamation project activities?

- The BoR built the FSID as part of the Sun River project in 1908. Another part of the Sun River project is the Greenfields Irrigation District which this project will benefit also by increasing water availability to the river. BoR continues to be a major partner in District water conservation projects by providing people resources to find best ideas for the SRWG team effort.

(2) Does the applicant receive Reclamation project water?

- Yes. FSID was a BoR built project and receives BoR water.

(3) Is the project on Reclamation project lands or involving Reclamation facilities?

- Yes, project is on BoR lands and involving BoR facilities. The new water delivery system will remain on BoR project lands so no new easement will be required and will also remain a BoR facility.

(4) Is the project in the same basin as a Reclamation project or activity?

- Yes, the project is in same basin as a BoR project - the Sun River project.

(5) Will the proposed work contribute water to a basin where a Reclamation project is located?

- Yes, work will contribute water to same basin where BoR project is located.

- 5,460 acre-feet will be conserved eliminating a very wasteful delivery system and replacing with a PVC pipe. The water saved will be left in the Sun River increasing summer flows by approximately 13 cfs. This 13 cfs is crucial when current river flows reach as low as 30 cfs, which is almost half of the desired bare minimum flows of 50 cfs that the watershed partners are trying to maintain.

(6) Will the project help Reclamation meet trust responsibilities to Tribes?

- No.

(5) Performance Measures

- Environmental and Cultural Resources Compliance

(1) Will the project impact the surrounding environment (i.e., soil [dust], air, water [quality and quantity], animal habitat, etc.)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

- The project will have minor air disturbance during construction phase as the earth work of trenching and back-filling occurs. This will be minimized by reducing the length of time project is in construction phase.
- With extensive farming in this area, no animal habitat impacts are expected.

(2) Are you aware of any species listed or proposed to be listed as a Federal endangered or threatened species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

- There are no species either listed or proposed to be listed in this area.

(3) Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "waters of the United States?" If so, please describe and estimate any impacts the project may have.

- There are no wetlands or other surface waters that fall under CWA jurisdiction that will be impacted by the project. The pipelines will be installed in the existing delivery system.

(4) When was the water delivery system constructed?

- FSID delivery system was constructed in 1908.

(5) Will the project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

- The original delivery systems were constructed in 1908 that is in major disrepair. These delivery systems have been "cleaned" on numerous occasions since original construction to remove silt and/or excessive vegetative growth. Reclamation has reviewed the infrastructure in this area and has allowed projects like this to proceed under previous agreements. No new easements or changes will be required since putting pipe in existing delivery system.

(6) Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

- Cultural resource areas within the district do exist. Previous inventories by the Bureau of Reclamation have located and identified the resources that should not be disturbed. All regulatory compliance requirements are not completed at this time; however they will be completed prior to initiation of this project. Fort Shaw Irrigation District will work closely with Reclamation to achieve compliance with both National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA).

Should not require any "archeological findings of concern" since putting pipe in existing delivery system.

(7) Are there any known archeological sites in the proposed project area?

- There are no known archeological sites where this work will be accomplished.

(8) Will the project have a disproportionately high and adverse effect on low income or minority populations?

- The project will have a beneficial impact on low income families as it improves their ability to increase production on what is currently waste land due to canal seeps into privately owned fields.

(9) Will the project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?

- The project will not limit access since no Indian sacred sites exist in this area.

(10) Will the project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

- There are noxious weeds in the area but District staff takes proactive approached to controlling the weeds and will take extra precaution not to move equipment through known patch sites that may still have weed seeds. After construction the sites will be monitored for new weed infestations that can be controlled immediately.

- Required Permits or Approvals

No permits required for this project. Not required because putting pipe in existing delivery system.

- Official Resolution

The District contributions to this project are $287,740 in-kind services of labor and equipment to install pipe with two years. See attachment # 1 on page 28 for commitment of these resources.

- Project Budget

-- Funding Plan and Letters of Commitment -

The District will contribute $297,740 of in-kind labor and equipment to install the project pipeline in the existing delivery system.

The Sun River Watershed Group has agreed to assist through $20,000 in-kind services the monitoring instream flow gages over two years for this project. See attachment # 2 on page 29 for commitment of these resources.

Program grant funds requested are $298,866. Total project cost is $606,606.

These non-Reclamation funds and in-kind services exceed the 50% match required from this grant program.

Table 1. Summary of non-Federal and Federal funding sources

Funding Sources	Funding Amount
Non-Federal Entities	
1. FSID in-kind match	$287,740
2. SRWG in-kind	$ 20,000
Non-Federal Subtotal:	$307,740
Other Federal Entities	
1. None	
Other Federal Subtotal:	-0-
Requested Reclamation Funding:	$298,866
Total Project Funding	$606,606

Budget Proposal:

Table 3. - Funding sources

Funding Sources	Percent of total project cost	Total cost by source
Recipient funding	51%	$ 307,740
Reclamation Funding:	49%	$ 298,868
Other Federal Entities	**0**	$ 0
Totals	**100%**	**$ 606,606**

Funding Plan

(1) General Requirements

Task 1 - BoR or contract work on designs, NEPA and NHPA

- BoR with District for compliance work for the proposed project.
  - BoR or contract resources to accomplish - $ 8,000 - Grant
  - Engineer produce final design and oversee project - $38,000 - Grant
  - FSID labor, District manager - 100 hours x $30/hour = $3,000 - In-kind

Task 2 - Install 10,420 feet of PVC pipe

- *FSID prepare and award bid for PVC pipe, vents, gates, & turnouts*
  - FSID labor, District manager and secretary ..... = $4,400 - In-kind
    - 100 hours @ $30/hour
    - 140 hours @ $10/hour
  - Buy PVC pipe, 10,420 feet of 18" pipe - $187,560 - Grant
  - Buy headgates, field turnouts, vents - $ 31,500 - Grant
  - Buy pipe bedding material 3,000 yards @ $3.00/yard = - $ 9,000 - Grant
  - *FSID crew dig trench, pack, lay pipe and refill*
  - FSID labor to accomplish core work
    - 800 total hours for 3 people @ $15/hour ..... = $36,000 - In-kind
  - FSID labor, District manager - to oversee proper installation
    - 400 hours @ $30/hour ..... = $12,000 - In-kind
  - FSID excavator to dig trench and place pipe bedding material
    - 800 hours @ $76.49/hour .....= $61,192 - In-kind
  - FSID truck to haul bedding material
    - 700 hours @ $90.84/hour .....= $56,588 - In-kind
  - FSID truck to load trucks for bedding material
    - 700 hours @ $121.50/hour .....= $85,050 - In-kind
  - FSID dozer to backfill and pack trench
    - 500 hours @ $48.52/hour .....= $24,260 - In-kind

Task 3 - Reporting, compliance review and monitoring

- FSID District manager and secretary accomplish required grant and project monthly and final reporting and billing
  - FSID labor, District manager and secretary
    - 100 hours @ $30/hour ..... = $ 3,000 - In-kind
    - 225 hours @ $10/hour ..... = $ 2,250 - In-kind
- Engineer for final project inspection ..... = $ 2,000 - Grant
- SRWG technician labor to monitor flow over 2 years
  - 500 hours @ $40/hour ..... = $20,000 - In-kind

Other expenses - contingency and indirect

- Construction materials contingency @ 10% of materials grant costs
  - $228,060 x 10% .....= $22,806 - Gant

TOTALS	**$307,740 match**	**$298,866 Grant**

Table 4. Budget proposal table

BUDGET ITEM DESCRIPTION	COMPUTATION		RECIPIENT/ PARTNERS COST SHARE		RECLAMATION FUNDING	TOTAL COST
	Unit/price	Quantity	in-kind	cash		
SALARIES AND WAGES						
- Employee 1 - worker	15	800	$12,000		$0	$12,000
- Employee 2 - worker	15	800	$12,000		$0	$12,000
- Employee 3 - worker	15	800	$12,000		$0	$12,000
- Employee 4 - oversight	30	400	$12,000		$0	$12,000
EQUIPMENT						
- Excavator - dig trench & place pipe	$ 76.49	800	$61,192		$0	$61,192
- Dozer - shape canal & refill trench	$ 48.52	500	$24,260		$0	$24,260
- truck - haul fill	$ 80.84	700	$56,588		$0	$56,588
- loader - load trucks	$ 121.50	700	$85,050		$0	$85,050
SUPPLIES/MATERIALS						
18" pipe	$ 18.00	10,420	$0		$187,560	$187,560
reerelbos	$ 500.00	10	$0		$5,000	$5,000
vins	$ 950.00	10	$0		$9,500	$9,500
Pipe bedding material	$ 3.00	3000	$0		$9,000	$9,000
turnouts	$ 1,000.00	17			$17,000	$17,000
						$0
CONTRACTUAL						
- NONE			$0			$0
			$0			$0
OTHER						
Reporting & contracting	$10	365	$3,650		$0	$3,650
Compliance & reporting	$30	300	$9,000		$0	$9,000
Monitoring -labor/hrs	$40	500	$20,000		$0	$20,000
NEPA	$3,000	1	$0		$3,000	$3,000
NHPA	$5,000	1	$0		$5,000	$5,000
easements	$0	1	$0		$0	$0
Engineer assistance	$40,000	1	$0		$ 40,000	$40,000
TOTAL DIRECT COSTS			$307,740	$0	$276,860	$583,600
Contingency funds - 10% of material costs	0.1	$228,060	0	0	$22,806	$22,806
INDIRECT COSTS - __%			$0	$0	$0	$0
TOTAL PROJECT COSTS			$307,740	$0	$298,666	$606,406

$228,060

Budget Narrative

Salaries & Wages

- FSID Program manager, Rich Boyle
  - $30/hour for all work
    - 400 hours for project crew oversight
    - 300 hours assisting BoR in compliance review, bidding, and design
- FSID laborers - 3 person crew
  - $15/hour for pipe installation
    - 2,400 total hours to dig trench, pack, lay pipe, & refill

Fringe Benefits - NONE

Travel - NONE

Equipment

- FSID excavators dig trench, lay pipe, bedding material, help backfill, dig canal
  - $76.49/hour per Corps region 4 calculations
    - 800 hours for all tasks
- FSID truck to deliver pipe bedding material to the trench and canal project
  - $80.84/hour per Corps region 4 calculations
    - 700 hours for all tasks
- FSID loader to load bedding material into truck
  - $151.50/hour per Corps region 4 calculations
    - 700 hours for all tasks
- FSID dozer to backfill trench and shape canal
  - $48.52/hour per Corps region 4 calculations
    - 500 hours for all tasks

Materials & Supplies

- All materials below are for construction purposes and were estimated by acquiring quotes from local distributors
  - PVC 18" pipe - 10,420 feet ..... = $187,560
  - Major parts including inlet, outlet, turnouts, and elbows .....= $ 31,500
  - Gravel for pipe bedding@ $3.00/yard x 3,000 yards ..... = $ 9,000

Contractual

- FSID will contract with BoR or private for
  - NEPA ..... = $ 3,000
  - NHPA ..... = $ 5,000
  - Engineer design and project inspection ..... = $ 40,000

Environmental and Regulatory Compliance Costs

- Part of BoR or private contractual costs listed above

Reporting

- FSID Program manager, Rich Boyle
  - $30/hour for all work
    - 300 hours assisting in compliance review, permitting and project reporting
- FSID secretary
  - $10 hour for all work
    - 365 hours to specifically help with writing financial, program performance, semi-annual and final reports

Other Expernses

- SRWG technician, Alan Rollo
  - $40/hour for all monitoring work
    - 500 hours - monitoring flow over 2 years

Indirect Costs

NONE

Contingency Costs

- 10% of materials contingencies costs to take in account inflation and/or possible material price increases. 10% x $228,060 = $22,806

Total costs

- Entire project ..... = $606,606
- Non-federal cost-share indirect in-kind = $307,740
- Federal cost-share ..... = $298,866

RESOLUTION

Fort Shaw Irrigation District
Board of Commissioners
Fort Shaw, MT 59443

RESOLUTION SPONSORING
BUREAU OF RECLAMATION 2015 GRANT
FOR CANAL CONVERSION PROJECT

WHEREAS, Fort Shaw Irrigation District's infrastructure is in dire need of immediate and long-term improvements to conserve water and enhance delivery to water users, and

WHEREAS, Fort Shaw Irrigation District's overall infrastructure is in need of many improvements to improve its water management for this and future generations, therefore

BE IT RESOLVED, the Fort Shaw Irrigation District's Board of Commissioners has reviewed and authorizes the board's manager to pursue a Bureau of Reclamation 2015 grant for a canal conversion and water conservation project; and

BE IT FURTHER RESOLVED, the Fort Shaw Irrigation District's Board of Commissioners by the authority given to it by the State of Montana is committing the $180,000 in-kind services necessary to complete the infrastructure project by September 30, 2017.

Dated this 20th day of January, 2015.

President

Attest:

a non-profit organization benefiting all water users in the basin
816 Grizzly Drive Great Falls, Montana 59404 406-727-4437

January 20, 2015

Bureau of Reclamation

RE: Letter of Commitment

Dear Bureau of Reclamation:

The Sun River Watershed Group is writing this Letter of Commitment for Fort Shaw Irrigation District's 2015 Reclamation WaterSMART grant application. The Sun River Watershed Group (SRWG) and the Fort Shaw Irrigation District (FSID) have been engaged for more than 15 years on several activities to improve the overall health of this basin. FSID's past and current irrigation project's compliment the overall efforts of the watershed program.

We will commit $20,000 of in-kind resources to monitor water quantity before and after project accomplishments to document any improvements.

The key enhancements of this project will be improved water quantity in the Sun River from more efficient use of the basin's limited water supply. This is a perfect fit of projects with positive goals under the SRWG's work-plan. The SRWG will assist FSID in a monitoring program to ensure this project actually meets these goals.

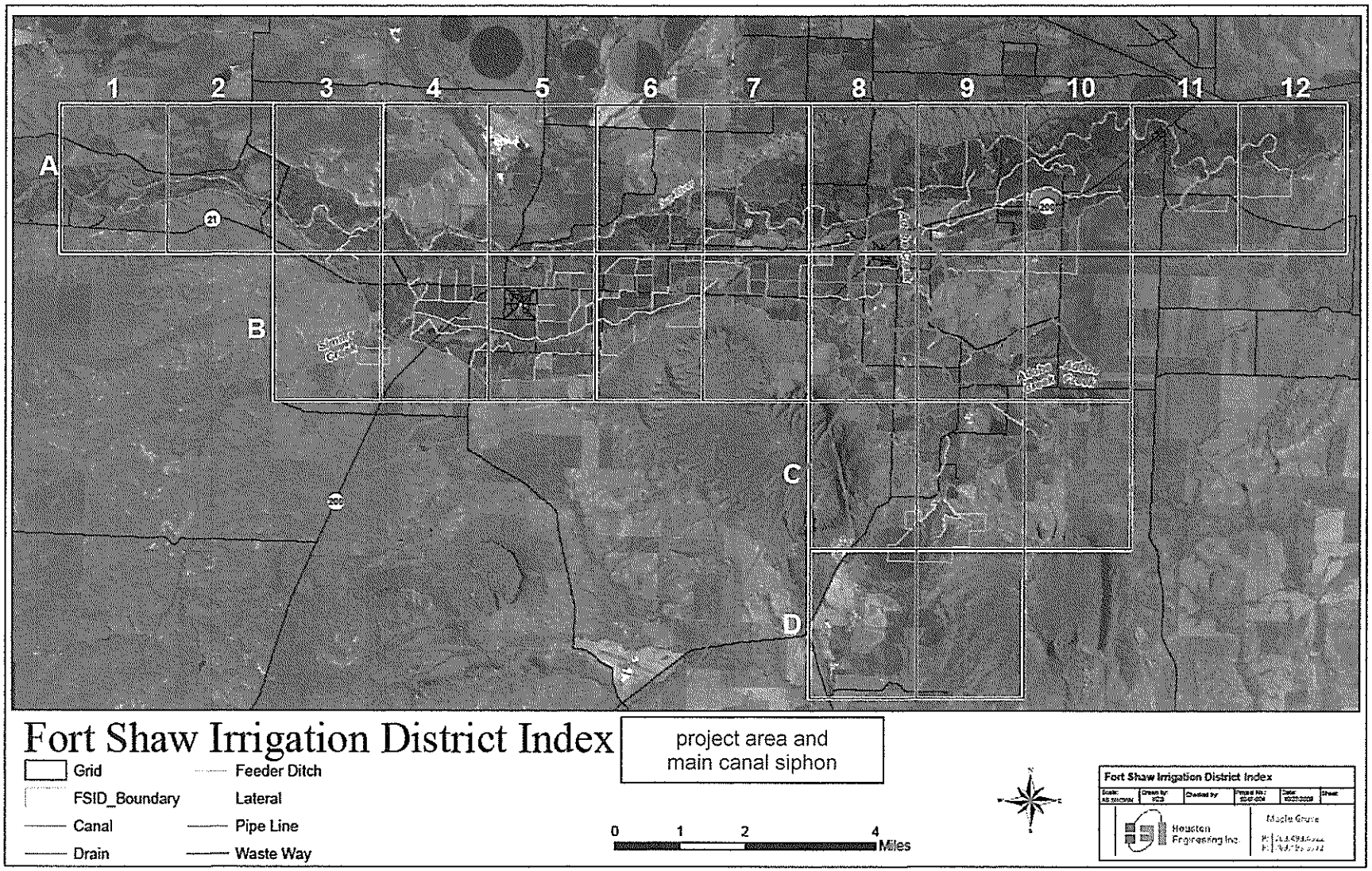
Call me at 406-727-4437 if have any questions concerning this project.

Sincerely,

Alan Rollo, Coordinator
Sun River Watershed Group

Cc: FSID

Fort Shaw Irrigation District layout and project location




Pipeline project area

Laura Ziemer
Senior Counsel and Water Policy Advisor

January 22, 2015

Bureau of Reclamation
Financial Assistance Management Branch
Attn: Mr. Shaun Wilken
Mail Code: 84-27852
P.O. Box 25007
Denver, CO 80225

Re: Trout Unlimited's Support for Fort Shaw Irrigation District's WaterSmart Proposal

Dear Mr. Wilken,

Trout Unlimited (TU) has been an active member of the Sun River Watershed Group for over a dozen years. During these last dozen years, TU has had extensive discussions with Sun River Watershed Group members about ways to improve agricultural operations within the watershed, while also improving the health of the Sun River. TU writes now to express its support for Fort Shaw Irrigation District's proposed project that does just that.

With the help of Reclamation, the Sun River Watershed has engaged in detailed project assessment and cost-effectiveness comparisons on a wide array of potential projects to accomplish this goal. The project proposed by the Fort Shaw Irrigation District in its 2015 WaterSmart request, *"Fort Shaw Irrigation District Water Efficiency Project"* is one of the projects that meets these carefully-considered criteria. This proposed project will address long-standing infrastructure needs while making a substantial contribution to restoring Sun River flows.

Please don't hesitate to contact me at lziemer@tu.org or (406) 599-2606 if I can be of assistance to you in your effort to ensure that WaterSmart funds are awarded to high-value projects with benefits to agriculture, watershed health, and rural communities.

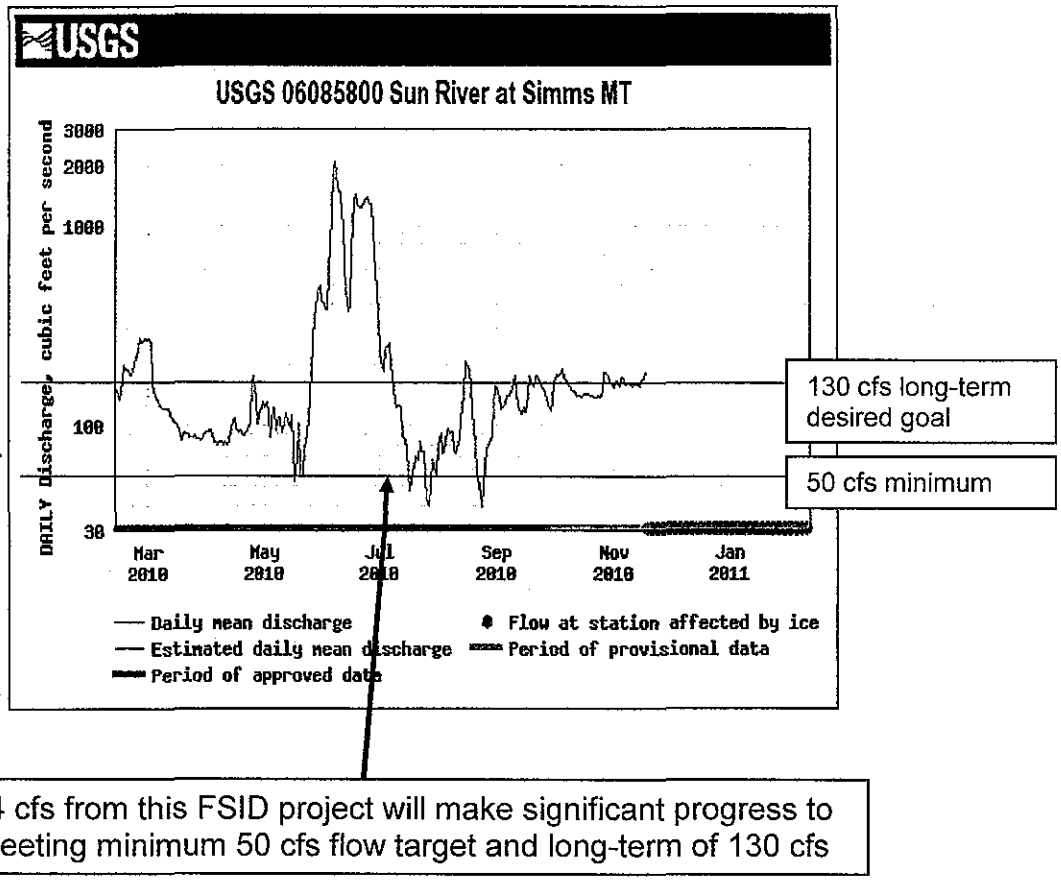
Yours truly,

Laura Ziemer

Cc: Rich Boyle, Fort Shaw Irrigation District Manager
Alan Rollo, Sun River Watershed Group Coordinator

Trout Unlimited: America's Leading Coldwater Fisheries Conservation Organization
321 East Main Street, Suite 411, Bozeman, MT 59715
(406) 522-7291 ext. 103 • cell: (406) 599-2606 • email: lziemer@tu.org • www.tu.org

USGS flow data in Sun River at Simms BELOW FSID headgate used to track lower Sun River flow conditions (50 desired bare minimum flow)



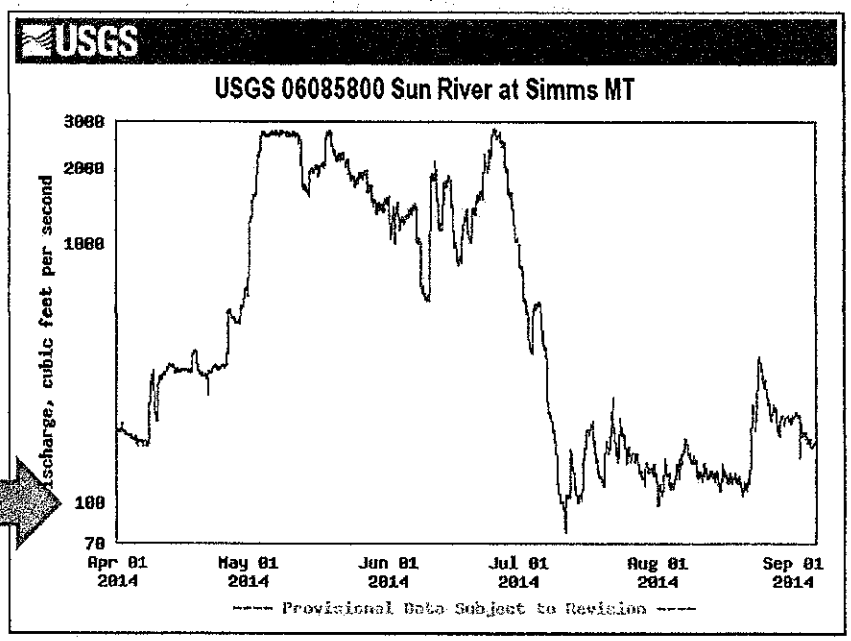
2014

488,000 a-f

Inflow to basin

April to July

Compare 100 cfs



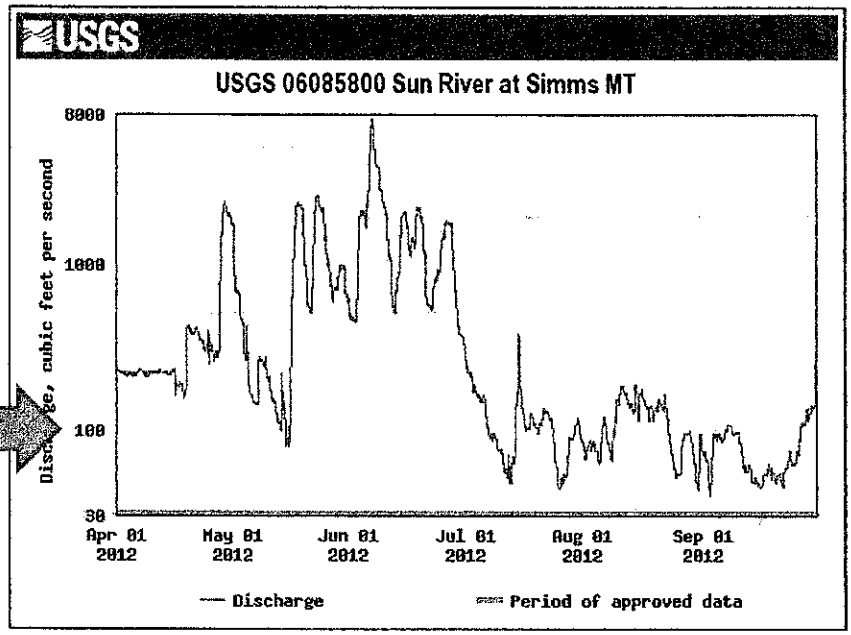
2012

457,000 a-f

Inflow to basin

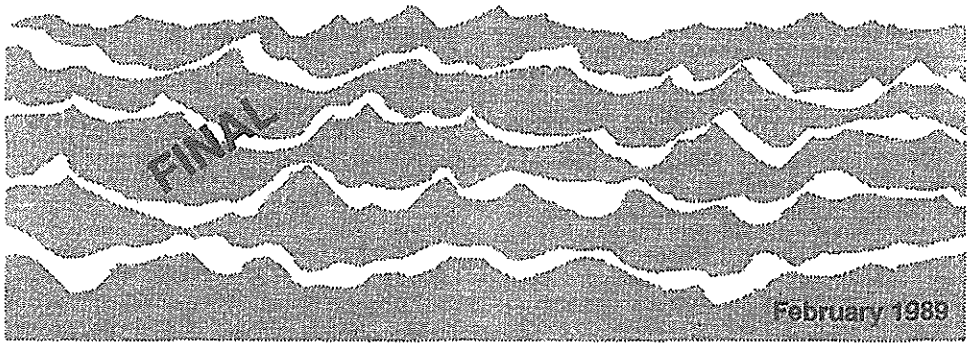
April to July

Compare 100 cfs



MONTANA WATER PLAN

Management Section



Subsection: Agricultural Water Use Efficiency

WATER RESOURCES DIVISION • DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
1520 EAST SIXTH AVENUE • HELENA, MONTANA 59620 - 2301 • (406) 444-6637

INTRODUCTION

Agriculture is Montana's largest business, providing about one-third of the total state income from primary industries. Irrigation contributes roughly one-quarter of agricultural income and, importantly, stabilizes agricultural production during the all-too-frequent dry years. Satisfying agriculture's vital demand for irrigation water requires the development and extension of water supplies through a combination of management strategies, including water storage. Another method is to improve the efficiency with which water is used.

The benefits of improved agricultural water use efficiency are diverse and include:

1. Improved ability to withstand periods of drought.
2. Increased irrigated acreage through the use of saved water.
3. Improved performance of aging irrigation facilities.
4. Increased irrigators' profits when the benefits of more efficient water use (increased crop production and sometimes decreased operating costs) are greater than the investment cost.
5. Reduced soil erosion and improved water quality.
6. Help in meeting the needs of current water users once the prior reserved rights of Indian tribes and the federal government are quantified and put to use.

Along with these benefits, improving water use efficiency may be important in terms of interstate water allocation. The U.S. Supreme Court has indicated that state conservation efforts will be considered if it is called upon to divide the waters of interstate rivers. The Court could decide to award smaller shares to states making no effort to increase water use efficiency, reasoning that these states could meet their future needs by saving more water.

BACKGROUND

Any strategy to improve agricultural water use efficiency must reflect an appreciation of several difficulties. First, because each irrigation situation is different, improving water use efficiency requires a case-by-case consideration of a number of complex geologic, hydrologic, and economic factors. Second, irrigation efficiency improvements can be very expensive. Third, water uses within a basin can be extremely interdependent. One irrigator's return flows or recharge to ground water can be another irrigator's water supply. Therefore, improving the efficiency of one water user could adversely affect the water supply of others. Fourth, while Montana law protects water users from adverse effects caused by other people's changes in water use, the law does not clearly establish who owns the right to water saved without adverse effects to others.

A number of options are already available to overcome some of these problems. The Montana Cooperative Extension Service, local conservation districts, and a number of other state and federal agencies provide technical assistance and information on water conservation measures. The Montana University System also supports research to improve our understanding of the complex factors that affect irrigation efficiency. Research may also help develop improved irrigation practices and technologies.

Funding assistance is available for irrigation efficiency improvements from a number of sources. These sources include the U. S. Agricultural Stabilization and Conservation Service, Farmers Home Administration, Soil Conservation Service, and the Montana Water Development Program administered by the Department of Natural Resources and Conservation (DNRC).

Given that one irrigator's water losses can be another irrigator's water supply, improvements in water use efficiency may adversely affect some water users. In light of this, the law provides potentially affected parties the right to object to certain changes in water use. Accordingly, the objective of increased water use efficiency is not to reduce the amount of water that is later reused. Rather, it is to decrease losses such as: (1) water used by weeds or other unwanted vegetation; (2) evaporation of standing water; (3) water that is not consumed but becomes inaccessible for reuse; or (4) water that becomes unusable because its quality has deteriorated.

The final difficulty stems from the fact that our water law is not clear on the question of who holds the right to salvaged water. In Montana, water rights are based on the amount of water historically put to beneficial use. If an irrigator decreases his use over time because of improved efficiencies, the legal status of the water no longer needed can be called into question. By one interpretation, this part of the water right would be considered abandoned and the water would go to the next junior user. Obviously, this would not encourage increased efficiency. Under a second interpretation, an irrigator who increases his efficiency retains the right to the salvaged water, so long as other water users would not be adversely affected by the change in water use. The irrigator may then have the option to expand

his irrigated acreage, sell, or otherwise benefit from the right to the salvaged water. Using this interpretation, an irrigator may be rewarded, rather than penalized, for becoming more efficient.

STATE WATER PLAN POLICY STATEMENT

Voluntary improvements in agricultural water use efficiency that expand water supplies for agriculture and other uses should be encouraged. Where improvements in water use would adversely affect other existing beneficial uses, such improvements should not be allowed.

ISSUES AND RECOMMENDATIONS

Issues

To encourage voluntary improvements in agricultural water use efficiency, three groups of issues must be successfully addressed.

1. Adequate information and educational opportunities must be readily available to irrigators, and research must be continued. How difficult is it for irrigators to obtain this information? Is it presented in a manner that is clear and persuasive? Are there adequate data for evaluating applications for water right changes in terms of adverse effects upon other water users? Is improving irrigation technologies and practices receiving adequate priority in the competition for agricultural research dollars?

2. Funding assistance may be necessary for those wishing to improve irrigation efficiency. Are existing programs capable of meeting future demands for funding? Are the kinds and levels of support adequate? Should the state Water Development Program give special consideration to irrigation efficiency-improving proposals? Are other sources of funding available, particularly for the rehabilitation and betterment of aging irrigation projects?

3. Laws clarifying who owns the right to salvaged water must be enacted to provide clear incentives for more efficient use. But when an irrigator increases efficiency, how will the amount of water salvaged be determined? Will it include water that otherwise would have been return flows? How will other water users be protected from adverse effects? Should restrictions be placed on how the saved water can be used?

Recommendations

In response to these issues, the following recommendations have been adopted:

1. The adequacy and effectiveness of existing information and research programs should be evaluated. Information should be provided to the state's irrigation districts and other organized irrigation associations on the availability of technical and financial assistance for improving irrigation efficiency. Further, these entities should be informed of their option under state law for the use of salvaged water.

2. Support for federal programs providing financial and other local level assistance to irrigators should be maintained. Special consideration should be given in the state Water Development Program for projects that would improve the efficiency of existing irrigation systems. Funds from the federal Pick-Sloan Missouri Basin Program should be allocated for use in the rehabilitation and betterment of irrigation projects.

3. The law should clearly provide that if an irrigator salvages water, he maintains the right to use the water. However, salvaged water must be defined to include only water that has not been available for reuse by other water users.

PLAN IMPLEMENTATION

Legislative Action

To provide effective financial support, the legislature should adopt a resolution urging Congress to authorize and appropriate funds from the Pick-Sloan Missouri Basin Program for the rehabilitation of irrigation projects. Such funding can be justified as compensation for water development projects promised to Montana under the 1944 Flood Control Act, but never received.

Legislation also should be passed that clarifies the rights of water users to salvaged water. Such legislation should carefully define "salvaged water" to include only the saved water that otherwise would have become consumed or unusable for other existing appropriators. The use of salvaged water for a different purpose, in a different place, from a different point of diversion, or from a different source of storage would require a change in water right in accordance with Montana law.

Administrative Action

To improve education and research on irrigation efficiency, the DNRC, in cooperation with the Montana Cooperative Extension Service and the U.S. Soil Conservation Service, should evaluate the effectiveness of existing research and public education programs. A report should be prepared to the State Water Plan Advisory Council that sets forth recommendations for any improvements in these programs.

The state's irrigation districts and other organized agricultural water user groups should be informed of available technical and financial assistance for improving irrigation efficiency. They should also be informed of the opportunity to use salvaged water if the legislation recommended above is enacted.

To assure continued federal government support for improving agricultural water use efficiency, the DNRC should continue to monitor and support federal funding for programs or projects that improve agricultural water use. In addition, the Water Development Program should give special consideration to project proposals that improve the efficiency of existing irrigation projects. The Governor's Office and the DNRC should also pursue all administrative and intergovernmental channels available to obtain Pick-Sloan funding for irrigation project rehabilitation.

Financial Requirements and Funding Strategies

It is anticipated that the administrative actions can be accomplished with current levels of funding.

Time Schedule

Activity	Responsibility	Deadline
A. Development and Implementation Tasks		
1. Draft Legislation	DNRC	January 1989
2. Enact Legislation	Legislature	April 1989
3. Contact irrigation districts and water users' associations	DNRC	May 1989
4. Complete evaluation report on irrigation efficiency information and research	DNRC	September 1989
B. Ongoing Tasks		
1. Rank irrigation efficiency project proposals to the Water Development Program	DNRC	
2. Monitor and support federal funding, including Pick-Sloan Program Funding	DNRC/Governor's Office	

SUN RIVER PROJECT

FORT SHAW IRRIGATION DISTRICT

WATER MANAGEMENT AND WATER CONSERVATION PLAN

May 13, 2009

Prepared by: FSID Board and manager, Alan Kinkaid

CONTENTS

INTRODUCTION: The Fort Shaw Irrigation District prepared this water management and conservation plan as a management tool to improve the efficient use of available water, prioritize projects, improve water quality in the Sun River, improve the agricultural economy within the district, and fulfill the water conservation planning requirements stipulated in the Reclamation Reform Act of 1982.

I. DESCRIPTION OF THE DISTRICT

A. **HISTORY** - Irrigation in this area began shortly after the establishment of Fort Shaw in 1867 as a means to supply water for the fort's fields and gardens. The Reclamation Act was proclaimed June 27, 1902 and appropriated receipts from the sale of public lands to construction of irrigation works for reclamation of arid lands. As part of the pursuit of irrigated lands, in 1903 the Reclamation Service made the first reconnaissance of the Sun River Project area. The Fort Shaw lands included 29,842 acres of which approximately 16,000 acres were considered irrigable. Of these acres, the Indian School utilized some. As the Reclamation Service moved to withdraw lands for future projects, the Sun River Project was considered a secondary project at that time. On February 26, 1906, the Secretary of Interior authorized the Sun River Project, which included Fort Shaw Irrigation District (FSID) and Greenfields Irrigation District (GID). On June 9, 1906, Congress approved a bill providing for the disposition on the non-school lands to the settlement, subject to withdrawal by the Reclamation Service as needed for the irrigation project. The Reclamation Service moved to withdraw the Fort Shaw lands from settlement on September 20, 1906. The Fort Shaw unit was selected as the first component of the Sun River Project to be undertaken. Construction began May 1907 and was completed in July 1908. The first water was delivered in 1909. The FSID operates and maintains the division facilities, which is still owned by Bureau of Reclamation (Reclamation). Division headquarters are in Fort Shaw, Montana.

B. **PHYSICAL CHARACTERISTICS** - The FSID is located within the bounds of the Fort Shaw Division of the Reclamation Sun River Project, Montana located in central Montana (See attachment #1 for area maps). The FSID is located south of the Sun River and surrounds the towns of Simms, Fort Shaw, and Sun River. It now contains approximately 11,500 irrigable acres on 177 small farms.

Water is supplied to the project from the Sun River to the Fort Shaw Canal, utilizing a rock overflow dam as a diversion structure. The water flows from the river by gravity through the main canal and into the distribution system. The main Fort Shaw canal is 16 miles in length and the distribution laterals total 85 miles in length. The initial capacity of the main canal was about 225 cfs. The table below shows approximate carrying capacity of primary structures within FSID.

Main Canal	Siphon	A-Canal	C-Canal	D-Canal	K-Ditch
235	195	85	35	70	35

Sun River Watershed Special Study - Executive Summary page

Executive Summary

In 2009, Reclamation, in consultation with the Sun River Watershed Group (SWRG), initiated the Sun River Special Study. The Special Study is an inventory and analysis of proposed measures that could be implemented to improve streamflow in the Sun River while maintaining or improving irrigated agriculture production. The study identifies a procedure by which water savings can be allocated between improved streamflow in the Sun River and irrigation needs. Although the purpose of the Special Study was not to fund projects, it does identify steps that can be taken towards implementing projects.

The Special Study identifies potential projects that might save water and provide shared benefits to agriculture and instream flow. This includes projects identified in previous studies, and those brought forth during the Special Study. The potential projects identified were placed into four categories:

1. Those that improve delivery system efficiencies
2. Reservoirs, which would include new reservoirs or improvements to existing reservoirs
3. On-farm efficiency improvements
4. Other water management measures

Information was compiled on the identified projects and the projects with the best potential were compared and ranked. The ranking did not strictly order the projects from highest to lowest, but partitioned projects into three groups based on when it might realistically be possible to implement the projects. Group 1 projects were those that ranked high and which the group could pursue now or in the near future. The second group of potential projects consisted of those which the group considered to be good projects overall, but where there was a lot more work to be done before the projects could be implemented. The third group consisted of projects that might have some potential, but were complex, possibly expensive and not workable at this time, but could still be considered in future work planning.

The last section of the report outlines a plan for further evaluating and implementing the projects. Basic procedures that might be followed, from feasibility studies through project construction, are identified. Because every project is different, this implementation plan is general rather than project specific. An important component of any project selected would be to develop a plan for sharing the saved water between irrigation and instream uses.

This Special Study has identified a number of projects that have the potential to conserve water, and provide shared benefits to irrigators and instream flow in the Sun River. Although no one project will solve all of the low-flow problems in the watershed, taken together, these projects might be enough to produce shared benefits and to increase Sun River instream flows at key locations, and during critical times. Implementing these projects will require a commitment from group members and working together as a team to obtain the necessary funding for design, authorization, and construction. Continued success of the project will require follow-through with operation and maintenance long after the projects are constructed. Developing agreements among parties that allow for sharing a project's water-saving benefits between irrigation and instream uses will be critical to the success of these projects, and for achieving the goals of the Special Study.

The Special Study identifies projects and recommends a path for achieving the goals of improving Sun River flows and agricultural productivity. While the Special Study was in progress, the FSID and SRWG pursued an available opportunity to fund and implement a water conservation project with shared benefits. This project is presented in the report as an example of how future projects could be implemented to achieve Special Study goals.

Outdoors

COLLABORATIVE EFFORT HELPS IRRIGATORS AND FISHERY

LESSONS FROM THE SUN

WATER IN THE WEST

Attachment #10