

## **Special Investment Partnership Concept Proposal**

**Partnership Name:** Willow Creek Piping Project

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### **Ecological Objectives:**

This proposal will take advantage of the opportunity to comprehensively treat a watershed. The lower Malheur and Willow Creek drainages are an area of intensive agricultural production in eastern Oregon. Some farming practices, including open irrigation laterals, cause these drainages to receive excessive levels of sediment, nutrients, and *E.coli*, primarily from irrigation return flow, and contribute to poor water quality. Oregon Department of Environmental Quality ranks the lower Malheur River and Willow Creek as having the second and third worst water quality in the state.

The Willow Creek Piping Project will not address the entire drainage, but will focus on the 35,000 acres adjacent to Willow Creek and the Malheur River. Most of the agricultural activity occurs here, and it is where the majority of water quality concerns exist. This water is important to both local agriculture and fishery needs downstream. Piping irrigation laterals facilitates conversion to sprinklers, reduces the need for hydro-power, reduces tillage and fuel usage, conserves water, improves fish habitat, and benefits the local economy.

The objectives of the Willow Creek Piping Project are to address watershed priorities including:

- Environmental Improvements
- Reduction of Electricity and Fossil Fuel Requirements
- Improved Habitat for Federally Listed Fish Species
- Water Conservation
- Economic Benefits

### **Consistency of Concept with OWEB Mission:**

The Willow Creek Piping Project continues the OWEB mission by proactively focusing on the concerns that are within our power to change. By addressing these issues,

through best management practices, we can effectively improve our watershed. Education is the first step to restoration. We are aware of the main concerns within the Willow Creek and Malheur basins and have concentrated our educational efforts there for many years. In the last five years, through a variety of funders including OWEB, over \$7.8 million has been invested in the restoration of the Willow Creek watershed. This includes over \$1.3 million from private landowners. Along with the projects accomplished by the irrigation district, over 50 projects have been implemented on private lands. These projects have positively affected more than 6,500 acres in the Willow Creek watershed. These restoration efforts are complemented by more than 10 years of water quality and project monitoring data to document the success of our work.

While the accomplishments are substantial, there remains much more to be done. To date, OWEB-funded projects have been funded through the large and small grant programs. The extensive amount of work remaining in the 35,000 acre concentration zone simply cannot be accomplished through these types of grant programs. It will require a longer time-frame and dedicated funding through a number of sources in order to complete the goals.

### **Consistency with SIP Principles:**

#### Ecological Significance –

In the 1990's, the Malheur Watershed Council and the Malheur SWCD began a program of water quality monitoring that encompassed Willow Creek. The results consistently indicated problems, primarily with bacteria, and a focus group was formed to address the issues. Most of the agricultural activity occurs in the 30,000 acres adjacent to Willow Creek from below Brogan Canyon to the confluence with the Malheur River. This is the area addressed in this proposal.

In response to these issues, the Lower Willow Creek Working Group formed in 2000 under the umbrella of the Malheur Watershed Council. This group consists of local landowners dedicated to promoting practical solutions to water quality and other environmental problems. Since its formation, the working group has sponsored grants for more monitoring, feedlot improvements, irrigation system upgrades, and much more. To solicit landowner involvement, the group conducts town hall meetings, sends out flyers, knocks on doors, and uses word of mouth.

In 2002, the Department of Environmental Quality placed Willow Creek on the 303(d) list for not meeting chlorophyll a (algae) and bacteria standards. Willow Creek has several water quality and social problems. One is the large number of livestock on feedlots near Willow Creek. The concentration of livestock in the Willow Creek drainage is second only to the Tillamook area. A consequence of concentrating large numbers of animals in one relatively small area is that animal waste is bound to get into streams. Large feedlots and dairies have already made the improvements needed to protect water quality as a condition of their permit with the Oregon Department of Agriculture.

Current bacteria sources under human control are tail water from flood-irrigated pastures and small lots where contaminated runoff can reach surface waters. An experiment conducted by Dr. Clint Shock and others showed that tail water from irrigated pastures could contain up to 230,000 *E. coli* colonies per 100 mL of sample. The state's bacteria standard allows only 406 colonies per 100 mL.

A second problem is irrigation-induced erosion. The most common method of irrigating is called furrow irrigation. This method consists of delivering water to a field via a ditch or pipe. Water is then sent by gravity down a furrow (also called corrugates), a narrow trench made by a plow. Crops are grown on raised beds between the furrows. Massive amounts of soil are carried off the fields by the irrigation water. When water reaches the end of each furrow it is collected in a receiving ditch. These tail water ditches eventually lead to Willow Creek.

Experiments and computer modeling have shown that soil losses from furrow irrigation can be as high as 15 to 20 tons per acre per year. About 30,000 acres in Willow Creek are furrow irrigated. If every field eroded at 15 to 20 tons per acre per year that would mean 600,000 tons or about 50,000 dump truck loads of dirt potentially enters Willow Creek each year.

The preferred method for eliminating return flow is for farmers to convert from furrow irrigation to sprinklers. Piping delivery laterals from the main canal will facilitate conversion to sprinklers by providing a gravity pressure water system, making conversion economically feasible. Gravity sprinkling reduces and/or eliminates the need for hydro-power; and, because using sprinkler irrigation systems reduces tillage needed for crop production, fossil fuel use will be reduced substantially as well.

A third issue is that a federally listed fish species, bull trout, resides in the North Fork of the Malheur River. Willow Creek irrigators use water from Beulah Reservoir, a dam on the North Fork. Radio tag studies show some bull trout adults leave the reservoir in April-May and reside in upper basin spawning areas throughout the summer where optimum water temperatures for adult bull trout are present. They return to the reservoir in late October after spawning. During drought years, the reservoir levels become too low to provide quality winter habitat for the fish. Converting open laterals from the main canal to pipe will result in conserving a substantial amount of water that is ordinarily lost to seepage and evaporation each year. Upon completion of this project approximately 12,000 acre/ft of irrigation water should be saved annually. The water savings from improved irrigation efficiency will potentially help maintain a pool in Beulah Reservoir. This will benefit winter habitat for bull trout populations.

The benefits of this proposal have been calculated according to known amounts associated with labor and equipment usage, energy consumption and typical farming practices in this area. Totals are approximated to the nearest reasonable figure. If all irrigation laterals were piped that were able to provide gravity-pressurized water to users, the following would be accomplished:

#### *Environmental Benefits Achieved:*

- 800,000 lbs of CO2 emissions eliminated annually.
- 72,000 lbs. of phosphorus annually prevented from leaving the field.
- 240,000 tons of annual soil loss will cease.
- 183.5 billion colonies of E.coli bacteria per acre prevented from leaving the fields as runoff.
- Virtually all evaporation and seepage eliminated.

#### *Energy Conservation Realized:*

- 4 – 6 million Kilowatt hours of electricity saved annually.
- 54,000 gallons of diesel fuel per year conserved.

#### *Water Conservation Benefits:*

- Approximately 12,000 acre feet of irrigation water should be saved annually.

#### *Economic Advantages Gained:*

- 35 jobs potentially created.
- \$162,000 per year in fuel costs saved (this amount is rising rapidly).
- \$229,000 in electrical pumping costs saved annually (also rising).
- At least 23 Oregon businesses involved.
- \$1.8 million generated for the local economies of Ontario and Vale.

#### Importance of OWEB's Contribution -

OWEB's previous contributions to the Willow Creek and Malheur watersheds have leveraged an additional 78% in contributions from agencies, irrigation districts, conservation groups and private landowners. In the past five years, Vale Oregon Irrigation District (VOID) has piped over 30 miles of laterals. However, there is an additional 83 miles of laterals yet to be piped. The irrigation district is committed to continuing to supply the majority of labor and equipment necessary to accomplish this goal.

The overriding conservation priorities in the Lower Malheur River watershed are a reduction in energy requirements and improved water quality and quantity. The need to focus on these priorities was intensified with the adoption of the Malheur River TMDL. Landowner education during the TMDL process focused on best management practices, habitat requirements, and restoration options necessary in order to move toward meeting the TMDL standards.

The biggest problem landowners and producers face is the cost of making the necessary improvements to protect water quality. Upgrading from furrow irrigation is particularly expensive. While it is true that producers benefit from irrigation improvements by increased yields and conserving water, the benefits are not great enough for most landowners to convert all on their own. Estimates show it could take as long as 15 to 20 years to recoup a farmer's investment in a center pivot. This rate of return is not high enough for most bankers to loan, and in an area that ranks 34<sup>th</sup> of 36

counties in Oregon for per capita income, the average landowner is not able to make these improvements without help.

In a typical urban setting each landowner has, on average, the ability to personally affect about 0.5 acres. In Willow Creek, with a much sparser rural population of about 500, each landowner can, on average, personally affect 100 acres within their watershed. Through education and the proactive achievements of numerous landowners and the irrigation districts, the majority of Willow Creek landowners are already on-board and enthusiastic about watershed restoration projects – if there are viable financial options.

### Robust Partnerships –

The Lower Willow Creek Working Group has enjoyed several dedicated partnerships. Both hands-on and financial contributions have come from many of the expected sources including the Malheur Watershed Council, Malheur SWCD, ODA, ODFW, BOR and other agencies. The private landowners and producers living and working in the Willow Creek watershed have consistently supported and actively participated in the restoration work in this area. The local NRCS office has also willingly partnered with landowners to maximize the ability to accomplish our shared priorities. In 2009, the Willow Creek basin was awarded special AWEF funding of \$1.5 million over five years, although because of federal funding cuts our annual allotment has been significantly reduced for the last two years. The most dependable and devoted partner has been the Vale Oregon Irrigation District. They have supplied the labor and equipment to implement all the irrigation lateral projects to date, so far providing a contribution of approximately \$1.5 million.

### Triple Bottom Line –

As has been outlined throughout this proposal, the ecological, community and economic outcomes are all being addressed. The livelihood of the farmers and producers in the Willow Creek and Malheur basins depends on the health of the watershed. A large number of area businesses depend on purchases from and business dealings with local producers. With Malheur County being one of the poorest counties in Oregon, economic decline spells disaster for so many locally owned businesses.

This proposal will directly provide much needed jobs and opportunities for local businesses. The construction phase of the project alone will last four to six years. In addition, yield increases due to more efficient sprinkler irrigation, will increase revenues to producers, which in turn will help the local economies of Vale and Ontario. These benefits will last for the life of the project. VOID will hire additional personnel within the local area for jobs related to labor, equipment operation, engineering and other staff necessary to implement the project.

We have proven through past projects that watershed restoration can benefit both the producer and the environment.

### Captures the Imagination / High Visibility –

While Malheur County may be one of the least populated areas in Oregon, we are still the largest. As one of the most concentrated agriculture areas in the northwest, products grown and raised here are sold throughout the nation and the world. What happens here affects Oregon. Over the years, farming and ranching has often received bad press. Some of it deserved, but much of it based in misinformation and conjecture. We have a unique opportunity to produce high-profile accomplishments in eastern Oregon.

With the irrigation lateral piping projects that have been done so far, there is certainly no shortage of exposure among residents. These are BIG projects and everyone sees them, talks about them and wants to know more about them. Many of the points in this proposal are along highway corridors visible to anyone traveling this way. Several large-scale tours have been done with a mixture of local and state politicians, media, tribal representatives, agencies (including the OWEB Board), and interested parties from the farming and ranching communities from around the state and also in Idaho.

The interest and involvement of so many of the area's producers has grown into a true grass-roots effort and a genuine excitement in restoring the watershed. We are becoming more and more involved in the schools and their educational efforts to bring up a new generation of land stewards who desire to leave the land in better condition than they found it. Although some may not consider Malheur County to be highly visible to anyone, we are at the top of the Columbia River watershed within the state of Oregon and water runs downhill.

### Ripeness –

As noted throughout this proposal, these objects have been worked on for many years and the procedures are not new. VOID has a majority of their open laterals already engineered and the specifications determined. This is a shovel-ready project. We know the drill, the preparations have been done and we are chomping at the bit. It will not be difficult to sit down and put the details of the project in a concise and reasonable form to begin implementation.

### **Evaluation:**

The evaluation of completion of this proposal is relatively simple. There are approximately 83 miles of open irrigation laterals to pipe in this system. Accomplishments are easy to track since they are tangible and observable. A timeline will be constructed along with short and long-term goals. VOID is experienced in construction of these buried laterals with more than 30 miles accomplished so far.

## **Expected Partners and Contributions:**

These figures are the accomplishments in the Willow Creek watershed over the last five years. They do not include any projects accomplished through NRCS, AWEP, EQIP or the Malheur SWCD. We are proud of this list and let it stand as an example of what we can achieve through our partnerships. We expect to continue with most of these partners in a similar manner.

### Total Dollars and In-Kind Match

OWEB (Oregon Watershed Enhancement Board)	\$4,398,998
BOR (Bureau of Reclamation)	\$375,000
MWC (Malheur Watershed Council)	\$12,672
VOID (Vale Oregon Irrigation District)	\$1,499,470
OWC (Orchard Water Company)	\$165,250
WID (Warm Springs Irrigation District)	\$16,060
LWCWG (Lower Willow Creek Working Group)	\$3,890
MCWAB (Malheur County Weed Advisory Board)	\$300
ODFW (Oregon Dept. of Fish and Wildlife)	\$300
ODA (Oregon Dept. of Agriculture)	\$14,030
PF (Pheasants Forever)	\$1,050
LO (Private Landowners)	\$1,315,080

**Grand Total** **\$7,852,100**

### Accomplishments

Total Individual Projects (excluding Laterals) = 56  
Total Acres Converted From Flood To Sprinkler = 1,692  
Total Miles of Laterals Piped = 33.4  
Total Miles of Mainlines Piped = 15.45  
Total Miles of Drains and Canals Piped = 4.14  
Total Number of Pumpback Systems = 15 systems serving 1,175 acres  
Total Number of Off-stream Water Troughs Installed = 19  
Total Miles of Pipe for Troughs = 1.93 (10,210 feet)  
Total Miles of Cross Fencing = 2.5  
Total Miles of Riparian and Wetland Protection Fencing = 13.32  
Total Riparian Plantings = 4,000  
Total Number of Wetland Filter Ponds = 3  
Total Acres of Rangeland Improved = 755  
Total Acres Served By Piped Laterals = 6,500

# The Willow Creek Piping Project

If all irrigation laterals located 50 feet or more below the Main Canal were piped and equipped with sprinklers, we could provide gravity-pressurized water to 12,000 acres and accomplish the following:

### Economic Advantages Gained

- 35 jobs potentially created.
- \$162,000 per year in fuel costs saved.
- \$229,000 in electrical pumping costs saved annually.
- At least 23 Oregon businesses involved.
- \$1.8 million generated for the local economies of Ontario and Vale.

### Environmental Benefits Achieved

- 800,000 lbs CO2 emissions eliminated annually.
- 72,000 lbs. of phosphorus annually prevented from leaving the field.
- 240,000 tons of annual soil loss will cease.
- 183.5 billion colonies of E.coli bacteria per acre prevented from leaving the fields as runoff.
- Virtually all evaporation and seepage eliminated.

### Energy Conservation Realized

- 4 - 6 million Kilowatt hours of electricity saved annually.
- 54,000 gallons of diesel fuel per year conserved.

### Threatened and Endangered Species Supported

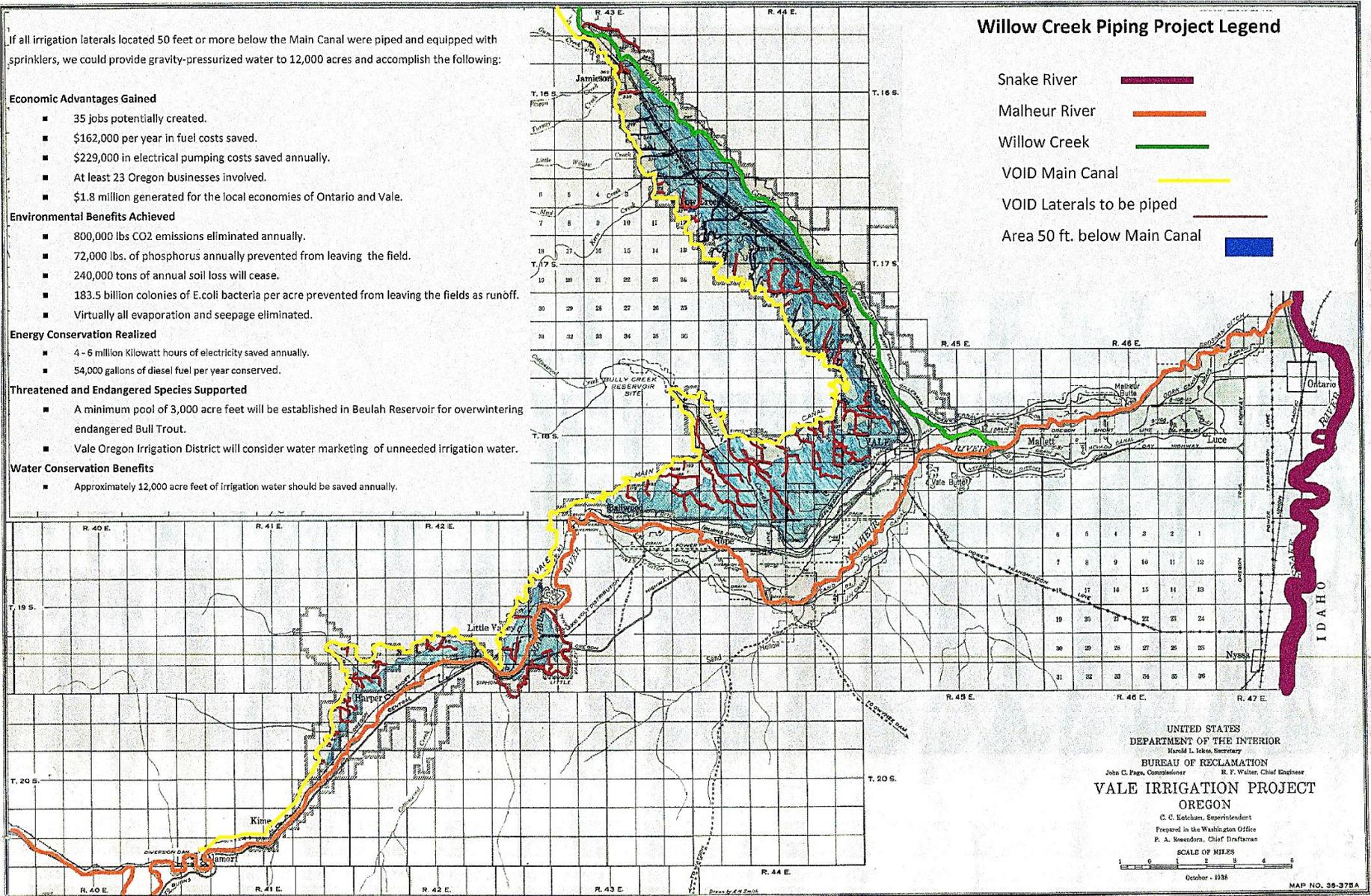
- A minimum pool of 3,000 acre feet will be established in Beulah Reservoir for overwintering endangered Bull Trout.
- Vale Oregon Irrigation District will consider water marketing of unneeded irrigation water.

### Water Conservation Benefits

- Approximately 12,000 acre feet of irrigation water should be saved annually.

### Willow Creek Piping Project Legend

- Snake River █
- Malheur River █
- Willow Creek █
- VOID Main Canal █
- VOID Laterals to be piped █
- Area 50 ft. below Main Canal █



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
John C. Page, Commissioner  
R. F. Walker, Chief Engineer  
C. C. Kelcham, Superintendent  
Prepared in the Washington Office  
P. A. Rosendorf, Chief Draftsman

VALE IRRIGATION PROJECT  
OREGON

SCALE OF MILES  
1 0 1 2 3 4 5

October - 1938

MAP NO. 36-378A