

**Horsefly Irrigation District  
Dairy and Yonna Canals Piping Project**

**WaterSMART Water and Energy Efficiency Grants  
FY 2014**

**Funding Opportunity No. R14AS00001**

By

Horsefly Irrigation District  
Klamath Basin, Oregon

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Horsefly Irrigation District  
Klamath Basin, Oregon

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## **Technical Proposal and Evaluation Criteria**

### **Technical Proposal: Executive Summary**

Date: January 22, 2014

**Applicant Name:** Horsefly Irrigation District  
**City, County, State:** Bonanza, Klamath County, Oregon  
**Contact:** Don Russell  
**Title:** Manager  
**Address:** P.O. Box 188  
**Phone:** cell (541) 281-1797 Office (541) 545-6474

**E-mail:** Horseflydist@centurytel.net  
**Project Name:** Water Conservation Project

**A one paragraph project summary that specifies the work proposed, including how project funds will be used to accomplish specific project activities and briefly identifies how the proposed project contributes to accomplishing the goals of the FOA (see Section III.B, “Eligible Projects”).**

This project is being submitted under Task A of the funding announcement, and will include converting 1.26 miles of open canal to a buried pipe system. If funded, the completed project is anticipated to conserve approximately 720 acre-feet of water. The water saved by this potential project would aide in conserving water resources in reservoirs and rivers of the Klamath Project, an area that has seen a lot of controversy over water availability in the previous decades.

**State the length of time and estimated completion date for the project.**

Upon receiving confirmation of Reclamation funding, the District anticipates they will complete the project within 2 years. Construction would begin in October 2014, and would be completed in October 2016.

#### Project Schedule

January 2014 - Submit grant application  
May 2014 – Anticipated Grant is announced  
June 2014 – Begin NEPA and cultural resources process  
August 2014 - HID request final bids for pipe  
September 2014 – Sign Funding Agreement  
September 2014 - Purchase Pipe and materials  
October 2014 - March 2015 - (weather dependent) - First phase of construction  
October 2015 – March 2016 – Second phase of construction  
October 2016 – Any final construction completed

### **(2) Technical Proposal: Background Data**

**Provide a map of the area showing the geographic location (include the State, county, and direction from the nearest town).**

Please refer to Exhibit A of this application

**As applicable, describe the source of water supply, the water rights involved, current water uses (i.e., agricultural, municipal, domestic, or industrial), the number of water users served, and the current and projected water demand. Also, identify potential shortfalls in the water supply. If water is primarily used for irrigation, describe major crops and total acres served.**

HID receives its water supply from several different sources under a number of contracts with Reclamation and the Oregon Department of Water Resources. HID has a pre-project water from Lost River, flowing from Clear Lake Reservoir, with a priority right of 1903. In addition, HID holds a water right from the Big Springs, originating from Lost River in Bonanza, Oregon. Lastly, HID is in contract with the Bureau of Reclamation to 4,200 acre-feet from storage of Clear Lake Reservoir, as well as 3,800 acre-feet of natural flow from the Lost River.

There are approximately 90 landowners served by HID over an area of approximately 10,000 acres. Crops grown on these acres include alfalfa (approximately 5,000 acres), grain (approximately 2,000 acres), irrigated pasture (approximately 2,971 acres), and potatoes

The Klamath Basin sits at 4100 ft elevation, with an average annual moisture of 12" to 14" per year, the majority being winter snowpack. However, currently Klamath County is experiencing a major shortage in snowpack, with only several inches to date. As such, water supply in the Klamath Project can become very limited in certain years and it is extremely important to conserve as much water as possible.

**In addition, describe the applicant's water delivery system as appropriate. For agricultural systems, please include the miles of canals, miles of laterals, and existing irrigation improvements (i.e., type, miles, and acres). For municipal systems, please include the number of connections and/or number of water users served and any other relevant information describing the system.**

The district is composed of a system of canals, constructed between 1915 and 1950. These facilities are solely dedicated for agricultural purposes. The original delivery system consisted of 25 miles of open canals. Through previous grants with Reclamation, approximately 5 miles of open canal has been converted to a piped system. It is HID's goal to have the entire system piped in the future years.

**If the application includes renewable energy or energy efficiency element, describe existing energy sources and current energy uses.**

HID has installed 3 Variable Frequency Drives (VFD) within the District. Through these improvements, and as outlined in reports by CH2M Hill, HID has experienced approximately 15% in energy savings. Due to the fact that the contracts between Reclamation and Pacific Power expired in 2006, the entire Klamath Project has seen a huge increase in power costs. Any activities which reduce energy consumption, and therefore cost, are essential to this area.

**Identify any past working relationships with Reclamation. This should include the date(s), description of prior relationships with Reclamation, and a description of the projects(s).**

HID has been working with Reclamation for over one hundred years in every aspect involving irrigated agriculture in the Klamath Basin. Our piping program began in 2004 through grants with Reclamation. Below is a breakdown of the previous grants that HID was awarded by Reclamation.

- Bonanza Town pipe project in 2004,
- Dairy Project in 2005,
- Continuation of the Dairy Project in 2006, 2007, 2008, 2009, 2010, and 2011.
- Yonna Project in 2008,
- Horsely Project in 2009
- Summers Project in 2009
- Armstrong Projects in 2009.

Throughout all of these projects, HID has had a good working relationship with Reclamation and has been successful in all projects. Most of these projects were managed out of the Klamath Basin Area Office.

### **(3) Technical Proposal: Technical Project Description**

**The technical project description should describe the work in detail including specific activities that will be accomplished as a result of this project. This description shall have sufficient detail to permit a comprehensive evaluation of the proposal.**

HID proposes to convert approximately 1.26 miles of open canal to a piped system. If this application is awarded HID would purchase a total of 6,700 feet of pipe. The first location, Dairy Canal, would include 1700 feet of 24" pvc and 2000 feet of 30" HDPE. On The second location, Yonna Canal, would include 3000 feet of 30" of HDPE.

To start the actual project, the first step will be to haul the equipment to the project site. Next, we will remove any existing turnouts, drop structures, or checks that would impede the placement of the pipe. Any fencing in the area which would prohibit construction, will be removed. HID will then use an excavator and D-4 Caterpillar to laser level the existing canal bed. The canal bed will be leveled to allow the pipe to lay properly at grade, and allow for gravity flow through the piping system. Once the ground is leveled, HID employees will begin installing the pipe in ground. Cleanouts, which allow for pump and maintenance access, will be constructed every 1000 feet. To accomplish this steel cleanouts will be welded together and installed within the canal. These cleanouts are square boxes and will be fitted around the pipe. These boxes will allow maintenance crews to access the pipe line after construction for annual inspections.

Once the pipe and cleanout boxes are installed, the pipe will be backfilled with soil from the existing canal banks. Once backfilled, the new pipe will have minimum cover of two feet and will be approximately four feet in ground.

### **(4) Technical Proposal: Evaluation Criteria**

**Evaluation Criterion A: Water Conservation**

**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:**

The District anticipates an estimated water savings of 720 acre-feet per year, as a result of the proposed project. This data was derived from reports produced by CH2M Hill, who has completed similar projects. Additionally, HID has performed water measurement activities and calculations from previous piping projects. HID has discovered that after piping 5 miles of their open canal system, they have conserved approximately 30% of the water which is delivered through these systems.

As a result of past programs with Reclamation HID has reduced the usage of a 75 horsepower pump by 50%. This pump represents a consumption of approximately 3000 gpm, as indicated by CH2M Hill. HID also uses rectangular weirs to determine how much water we are losing in a given open canal section. After repeated measurements, HID has determined that through an open canal system, the District loses approximately 30% of the total amount of water diverted.

The district continues to reduce their water demand through these piping projects. Due to the 5 miles of piped system, HID has reduced their water diversion demands from 35,000 acre-feet in 2006, to 25,000 acre-feet in 2012.

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

HID has an annual water supply under contracts of 25,000 acre feet. Once water is used for irrigation purposes and is recycled through the systems, it drains back into the Lost River

**Where will the conserved water go?**

If this project is funded, conserved water will not have to be diverted from the Lost River through Clear Lake Reservoir. Because Clear Lake Reservoir is under great demand for water and has Endangered Species Act requirements, any conserved water left in the system goes to benefit other water users or species in the reservoir.

**If the application includes renewable energy or energy efficiency elements, describe existing energy sources and current energy uses.**

If this project is funded, HID will not be required to pump as much water as they currently are. As a result, power consumption and cost will be reduced.

**(1) Canal Lining/Piping:**

**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.**

The District anticipates an estimated water savings of 720 acre-feet per year, as a result of the proposed project. This data was derived from reports produced by CH2M Hill, who has completed similar projects. Additionally, HID has performed water measurement activities and calculations from previous piping projects. HID has discovered that after piping 5 miles of their open canal system, they have conserved approximately 30% of the water which is delivered through these systems.

As a result of past programs with Reclamation, HID has reduced the usage of a 75 horsepower pump by 50%. This pump represents a consumption of approximately 3000 gpm, as indicated by CH2M Hill. HID also uses rectangular weirs to determine how much water we are losing in a given open canal section. After repeated measurements, HID has determined that through an open canal system, the District loses approximately 30% of the total amount of water diverted.

**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 methods(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of Canals.**

30% of the water that is pumped from Lost River into HID's system is lost to seepage, evaporation and weeds. Based on Pacific Corp. technical data for pump testing, HID knows how much a given pump consumes in water. Further down in the system, HID takes water measurements through the use of weirs and calculates the water lost in that particular section.

**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?)**

The post-project seepage losses should be 0%. Converting an open ditch to buried PVC pipe or HDPE will eliminate seepage and improve management practices.

**What are the anticipated annual transit loss reductions in terms of af / mile for the overall project and for each section of canal included in the project.**

The anticipated annual transit loss reductions from the conversion of open ditches to buried pipe should be the estimated seepage loss and the reductions from increased management opportunities, which are difficult to quantify.

**How will actual canal loss seepage be verified?**

The actual canal loss seepage reductions can be easily verified by measuring the diversion to a lateral and the delivery from the lateral. Similar projects in the past have yielded an approximate 100 % delivery rate.

**Include a detailed description of the materials being used.**

HID intends to use schedule 80# 24" PVC., 30" HDPE , and 30" HDPE pipe. Steel control structures will consist of 3/16 wall steel welded into proper service structures for control and measurement.

**(2) Municipal Metering:**

Not applicable.

**(3) Irrigation Flow Measurement**

**How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.**

The District anticipates an estimated water savings of 720 acre-feet per year, as a result of the proposed project. This data was derived from reports produced by CH2M Hill, who has completed similar projects. Additionally, HID has performed water measurement activities and calculations from previous piping projects. HID has discovered that after piping 5 miles of their open canal system, they have conserved approximately 30% of the water which is delivered through these systems.

As a result of past programs with Reclamation HID has reduced the usage of a 75 horsepower pump by 50%. This pump represents a consumption of approximately 3000 gpm, as indicated by CH2M Hill. HID also uses rectangular weirs to determine how much water we are losing in a given open canal section. After repeated measurements, HID has determined that through an open canal system, the District loses approximately 30% of the total amount of water diverted.

**Are Flows currently measured at proposed sites and if so what is the accuracy of existing devices? How has the existing measurement accuracy been established?**

Not all flows are measured at all sites. Given the age of some of the structures it is not possible to accurately measure some of the early farm turnouts. However, the District uses the nearest rectangular weir to determine total volume in the canal to that point as established by Reclamation Standards.

**Provide detailed descriptions of all proposed flow measurement devices, including accuracy and the basis for the accuracy.**

If awarded, HID will use rectangular weirs for flow measurement. Please see Exhibit B.

**How will actual water savings be verified upon completion of the project?**

Water savings will be measured using weirs that will be installed throughout the canals.

**(4) SCADA and Automation:**

HID is not currently involved with SCADA or Automation given the serious financial constraints.



**How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.**

N/A

**Have current operational losses been determined? If water savings are based on a reduction of spill, please provide support for the amount of water currently being lost to spills.**

N/A

**Will annual farm delivery volumes be reduced by more efficient and timely deliveries and if so, how has this reduction been estimated?**

N/A

**Will canal seepage be reduced through improved system management? If so, what is the estimated amount and how was it calculated?**

N/A

**How will actual water savings be verified upon completion of the project?**

N/A

**(5) Groundwater Recharge:**

N/A

**(6) Landscape Irrigation Measures:**

N/A

**(7) High-Efficiency Indoor Appliances and Fixtures:**

N/A

**(8) Other Project Types Not Listed Above:**

**How have average annual water savings estimates been determined? This should include a detailed description of the rationale and methodologies used to develop the estimates. Please provide all relevant calculations, assumptions, and supporting data. Reference relevant studies or past project documentation that support the water savings estimates.**

N/A

If new technologies or devices are proposed, how will the savings occur? Please provide detailed descriptions that will enable the reviewer to understand function and how savings occur.

N/A

How will actual water savings be verified upon completion of the project? Please explain the calculations and the analyses for this verification.

N/A

**AND/OR**

**Subcriterion No.A(b) – Improved Water Management:**

*Up to 5 points may be awarded if the proposal will improve water management through measurement, automation, advanced water measurement systems, or through implementation of a renewable energy project, or through other approaches where water savings are not quantifiable.*

**Describe the amount of water better managed.**

For projects that improve water management but which may not result in measurable water savings, state the amount of water expected to be better managed, in acre-feet per year and as a percentage of the average annual water supply. (The average annual water supply is the amount actually diverted, pumped, or released from storage, on average, each year. This does not refer to the applicant’s total water right or potential water supply.) Please use the following formula:

The districts annual water supply is 25,000 acre-feet per year, the Yonna Canal will show a savings of 216 acre- feet, the Dairy Canal will show a savings of 504 acre-feet.

<u>Estimated amount of water being better managed</u>	$\frac{216 + 504}{25,000} = 34.7\%$	Average
annual water supply		

**Subcriterion No.A.2 – Percentage of Total Supply:**

*Up to 8 additional points may be allocated based on the percentage of the applicant’s total average water supply that will be conserved directly as a result of the project.*

**Provide the percentage of total water supply conserved:**

State the applicant’s total average annual water supply in acre-feet. Please use the following formula:

<u>Estimated Amount of Water Conserved</u>	720 Acre feet	=	34.7% Average Annual Water
Supply	25,000		

**Subcriterion No.A.3 – Reasonableness of Costs:**

*Up to 4 additional points may be awarded based on the reasonableness of the cost for the benefits gained.*

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:

**Total Project Cost**  
(Acre-Feet Conserved, or Better Managed x Improvement Life)

\$400,622.00  
720 x 50 = 36,000      \$.898

*Failure to include this required calculation will result in no score for this section.*

For all projects involving physical improvements, specify the expected life of the improvement in number of years and provide support for the expectation (e.g., manufacturer’s guarantee, industry accepted life-expectancy, description of corrosion mitigation for ferrous pipe and fittings, etc.).

**Evaluation Criterion B: Energy-WaterNexus (16 points)**

*Up to 16 points may be awarded based on the extent to which the project increases the use of renewable energy or otherwise results in increased energy efficiency.*

**Subcriterion No. B.1 – Implementing Renewable Energy Projects Related to Water Management and Delivery:**

None

AND/OR

**Subcriterion No. B.2 – Increasing Energy Efficiency in Water Management**

*If the project is not implementing a renewable energy component, as described in Subcriterion No.B.1 above, up to 4 points may be awarded for projects that address energy demands by retrofitting equipment to increase energy efficiency and/or through water conservation improvements that result in reduced pumping or diversions.*

Describe any energy efficiencies that are expected to result from implementation of the water conservation or water management project (e.g., reduced pumping). Please provide sufficient detail supporting the calculation of any energy savings expected to result from water conservation improvements.

Please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements?

The HID pumps from Lost River from 10 pumping stations using 20 pumps. The total horsepower for all pumps is 1200 horsepower. The above pumps are essential to pump the necessary water for entire district for a season.

The proposed project will reduce the amount of water pumped and electricity consumed because the open canal will have been converted to pipe. Through the measured results of the past piping programs with Reclamation we are now seeing proof positive conservation.

As a result of past programs with Reclamation, HID has reduced the usage of a 75 horsepower pump by 50%. This pump represents a consumption of approximately 3000 gpm, as indicated by CH2M Hill. HID also uses rectangular weirs to determine how much water we are losing in a given open canal section. After repeated measurements, HID has determined that through an open canal system, the District loses approximately 30% of the total amount of water diverted.

**Please indicate whether your energy savings estimate originates from the point of diversion, or whether the estimate is based upon an alternate site of origin.**

All energy savings estimates originate at the current point of diversion.

**Does the calculation include the energy required to treat the water?**

No. All the in HID water is used by agriculture; therefore treating the water is not necessary.

**Describe any renewable energy components that will result in minimal energy saving/production (e.g., installing small-scale solar as part of a SCADA system).**

No.

**Evaluation criterion C: Benefits to Endangered Species (12 points)**

*Up to 12 points may be awarded for projects that will benefit federally recognized candidate species or up to 12 points may be awarded for projects expected to accelerate the recovery of threatened or endangered species, or addressing designated critical habitat.*

The districts within the Klamath Project find themselves with the responsibility of addressing the needs of the endangered species within the Klamath Project. The Lost River Sucker and the Short Nosed Sucker are both are listed as endangered species. If the HID is diligent in its effort to preserve water resources, this water becomes carryover in Clear Lake, remains in the Lost River System, or is used to benefit downstream users. These efforts to save water to these systems add to the habitat for the above mentioned endangered species. Water conserved would also benefit the Klamath Wildlife Refuge, a major part of the Klamath Project heritage and home to many types of birds, fish and wildlife.

**Evaluation Criterion D: Water Marketing (12 points)**

Not applicable Oregon is forbidden to market water under the current legislation.

**Evaluation Criterion E: Other Contributions to Water Supply Sustainability (14 points)**

*Up to 14 points may be awarded for projects that contribute to a more sustainable water supply in ways not covered by other criteria.*

**This criterion is intended to provide an opportunity for the applicant to explain any additional benefits of the proposed project within the water basin, including benefits to downstream water users or to the environment. Please provide sufficient explanation of the expected benefits and their significance, including any information about water supply conditions within the basin (e.g., is the river, aquifer, or other source of supply over-allocated? Is there frequently tension of litigation over water in the basin? Are there endangered species within the basin or other factors that may lead to heightened competition for available water supplies among multiple water uses? Is the possibility of future water conservation improvements by other water users enhanced by completion of the project?) Additional project benefits may include, but are not limited to the following:**

**Will the project make water available to address a specific concern? For example: Will the project address water supply shortages due to climate variability and/or heightened competition for finite water supplies (e.g. population growth or drought)?**

The Klamath Basin sits at 4100 ft elevation, with an average annual moisture of 12” to 14” per year, the majority being winter snowpack. However, currently Klamath County is experiencing a major shortage in snowpack, with only several inches to date. As such, water supply in the Klamath Project can become very limited in certain years and it is extremely important to conserve as much water as possible.

**Will the project market water to other users? If so, what is the significance of this (e.g., does this help stretch water supplies in a water short basin)?**

N/A

**Will the project make additional water available for Indian tribes?**

It has not been documented that our conserved water is available for tribes.

**Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved? (e.g., will the project benefit an endangered species by maintaining an adequate water supply)?**

N/A

**Will the project generally make more water available in the water basin where the proposed work is located?**

Yes

**(2) Does the project promote and encourage collaboration among parties?**

Yes. The project is a coordinated effort with HID and Reclamation and will have a positive impact to the District and to other water users. This water conservation project is meant to increase the available surface supply through improved delivery systems. This increased supply will be truly beneficial to district waterusers and the Klamath Project. Also, this project includes a benefit to endangered species (Lost River Sucker and the Short Nose Sucker in addition White Pelicans that prosper in Clear Lake, and wildlife in the Klamath Project).

**Is there widespread support for the project?**

Yes

**What is the significance of the collaboration/support?**

Waterusers within HID are seeing the benefits of the piping program. It has generated a great deal of support and encouragement. We are at the point of making necessary and serious savings, which will be of great benefit during these dry years and the challenges to come.

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

Yes. Managing water resources wisely and being proactive is important to preserving agriculture in the Klamath Basin. Reclamation, through its funding, is a positive avenue to help individuals and districts get above the line and make the necessary improvements that lead to wise resource management. Beginning in 2001 the Klamath Project has become the poster child of water conflict and crisis. The Klamath Basin has been under pressure to provide limited water to many groups in addition to the waterusers under the original Klamath Reclamation project. During these times of extreme weather conditions, including drought and low snow pack, these demands are increasingly threatening to the livelihoods of the agricultural community. It is the responsibility of all in the area to conserve and use our precious resources to the best use we can.

**(3) Will the proposed WaterSMART Grant project help to expedite future on farm irrigation improvements, including future on farm improvements that may be eligible for Natural Resources Conservation Service (NRCS) funding? If so, please address the following:**

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

HID has knowledge of at least 3 new pivots having been installed after the last project HID completed with the Reclamation.

Piping provides a consistent and improved supply of water to the wateruser. The water is cleaner than supplied by open canals and the discharge constant. This allows the wateruser to more efficient in the use of their limited supply.

**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.**

The on-farm improvements initiated by the waterusers will convert current practices of gated and flood irrigated pastures to pivot and linier irrigated ground.

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

Modern technology allows the wateruser to install a quarter mile pivot supplied by 30 hp motor.. A 30 horse motor and pivot = less energy consumption, minimal water consumption i.e., ¼ mile pivot will use 400 gpm., and reduced labor costs.

**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.**

For example, flood irrigating 160 acres requires 4 ac ft / ac minimum is 640 ac/ft per year + labor. A pivot will reduce their demand for water by 50% per year.

**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. Applicant s should provide letters of intent from farmers/ranchers in the affected project areas.**

No direct inclusion of on-farm benefits have been included or committed to in this proposal, are directly tied to NRCS funding.

**Describe the extent to which this project complements an existing or newly awarded AWEP project.**

N/A

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

Yes. Klamath Project stakeholders are very supportive of HID conservation efforts and are hopeful they will continue.

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

Yes. Waterusers under HID continue to lobby the District to contend for future conservation projects.

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

Yes. The project encourages on-farm efficiency.

**Does the project integrate water and energy components?**

Yes. The project features water conservation through piping and the installation of variable frequency drives.

**Evaluation Criterion F: Implementation and Results (10 points)**

*Up to 10 points may be awarded for the following:*

**Subcriterion No. F. 1---Project Planning**

*Points may be awarded for proposals with planning efforts that provide support for the proposed project.*

**Does the project have a Water Conservation Plan, System Optimization Review (SOR), and/or district or geographic area drought contingency plans in place? Is the project part of a comprehensive water management plan (e.g., the Yakima River Basin Integrated Water Resource Management Plan)? Please self-certify, or provide copies of these plans where appropriate, to verify that such a plan is in place. Provide the following information regarding project planning:**

**Identify a district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, or other planning efforts done to determine the priority of this project in relation to other potential projects.**

HID has a water conservation plan with the support of Reclamation and technical research conducted by CH2M Hill.  
See Exhibit C.

**Identify and describe any engineering or design work performed specifically in support of the proposed project.**

HID management and staff will conduct and perform all engineering of structures and installation of pipe.

**Describe how the project conforms to and meets the goals of any applicable State or regional water plans, and identify any aspect of the project that implements a feature of an existing water plan(s).**

HID is not aware of and state or regional water plan. This project will be an asset to plans developed in the future by the state or otherwise in harmony with Reclamation.

**Subcriterion No. F.2---Readiness to Proceed**

*Points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement.*



**Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. (Please note, under no circumstances may an applicant begin any ground-disturbing activities---including grading, clearing, and other preliminary activities---on a project before environmental compliance is complete and Reclamation explicitly authorizes work to proceed).**

Upon receiving confirmation of Reclamation funding, the District anticipates they will complete the project within 2 years. Construction would begin in October 2014, and would be completed in October 2016.

**Project Schedule**

January 2014 - Submit grant application  
May 2014 – Anticipated Grant is announced  
June 2014 – Begin NEPA and cultural resources process  
August 2014 - HID request final bids for pipe  
September 2014 – Sign Funding Agreement  
September 2014 - Purchase Pipe and materials  
October 2014 - March 2015 - (weather dependent) - First phase of construction  
October 2015 – March 2016 – Second phase of construction  
October 2016 – Any final construction completed

**Please explain any permits that will be required, along with the process for obtaining such permits.**

This project needs only Reclamations approval; no other permits will be required. The District has requested that Reclamation conduct the necessary work regarding NEPA and cultural resources.

**Subcriterion No.F.3---Performance Measures**

*Points may be awarded based on the description and development of performance measures to quantify actual project benefits upon completion of the project.*

**Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (i.e., water saved, marketed, or better managed, or energy saved). For more information calculating performance measure, see Section VIII.A.1 “FY2012 WaterSMART Water and Energy Efficiency Grants: Performance Measures”.**

Historically and currently HID does not divert water prior to the demand of the irrigation season. So conservation is maximized. The performance measure for he project will be an average historic loss rate (inflow – outflow) compared to the completed project. A piped system will have nearly 100% delivery rate. That is a great motivator for the project. Actual conservation will be likely adjusted in any reporting due to the actual length of the irrigation season.

**Evaluation Criterion G: Connection to Reclamation Project Activities  
(4 points)**

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

The average annual water supply to Horsefly Irrigation District is 25,000 acre-feet of surface water. The district surface water supply comes from stored water at Clear Lake (4,200 acre-feet), some residual water from Gerber Reservoir, and 59 sec/ft from Bonanza Springs. All the above is water supplied by contracts with Reclamation (9D contracts).

**(2) Does the applicant receive Reclamation project water?**

Yes.

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

Horsefly Irrigation District is situated within the Klamath Reclamation Project boundaries. There are no Reclamation facilities (i.e., reserved works) within Horsefly Irrigation District.

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

Yes.

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

Yes. The conserved water will remain in the Lost River System to benefit downstream users, the listed endangered species, and the Klamath Basin wildlife refuges.

## **Environmental Compliance**

**To allow Reclamation to assess the probable environmental impacts and costs associated with each application, all applicants must respond to the following list of questions focusing on the NEPA, ESA, and NHPA requirements. Please answer the following questions to the best of your knowledge. If any question is not applicable to the project, please explain why. Additional information about environmental compliance is provided in Section IV.D4 “Budget Proposal,” under the discussion of “Environmental and Regulatory Compliance Costs,” and in Section VIII.B., “Overview of Environmental Compliance Requirements.”**

**(1) Will the project impact the surrounding environment (e.g., soil (dust), air, water (quality and quantity), animal habitat)? 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 proposed project will have a minimal impact on the surrounding environment. The temporary disturbance of the soil caused by profiling or trenching will be minimal.. It is the intent of the district to keep all soil movement to a minimum. The District also intends to plant Klamath Basin Pasture grasses on the disturbed areas after construction.

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

The District is not aware of any in the project area.

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

No.

**(4) When was the water delivery system constructed?**

1915 through 1950

**(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.**

It is the Districts intent to replace open canals with buried pipe and replace all necessary control structures.

**(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.**

There are no buildings, structures, or features listed in the National Register of Historic places in the area

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

No sites are known at this time.

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

No

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

No.

**(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?**

No. From observation of past projects of this type, the implementation of this project will reduce the impacts and spread of non-native and native invasive species by eliminating the open canal system. The District also intends to plant native grasses on the disturbed areas thereby not providing a seedbed for noxious weeds.

### **Required Permits or Approvals**

**Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals. To complete a renewable energy project within the time frame required of the FOA, it is recommended that an applicant has commenced the necessary permitting process prior to applying.**

This project will need only Bureau of Reclamation approval to proceed. This approval will require environmental and cultural approvals. HID has had discussion with the Reclamation, and will request that Reclamation conduct NEPA and cultural resources requirements.

### **Funding Plan and Letters of Commitment**

**Describe how the non-Reclamation share of project costs will be obtained. Reclamation will use this information in making a determination of financial capability. Project funding provided by a source other than the applicant shall be supported with letters of commitment from these additional sources. This is a mandatory requirement. Letters of commitment shall identify the following elements:**

**(1) The amount of funding commitment.**

HID will commit to \$202,322.00 to this project. The greater portion of this amount is in-kind contributions of labor, management, and equipment. The total amount of the project is \$400,622.00 with \$198,300.00 requested through Reclamation.

**(2) The date the funds will be available to the applicant**

Not known

**(3) Any time constraints on the availability of funds.**

None known by HID at this time.

**(4) Any other contingencies associated with the funding commitment?**

No

**Commitment letters from third party funding sources should be submitted with your project application. If commitment letters are not available at the time of the application submission, please provide a timeline for submission of all commitment letters. Cost share funding from sources**

outside the applicant's organization (e.g., loans or state grants), should be secured and available to the applicant prior to award. Reclamation may approve an award prior to an applicant securing non-Federal cost-share funds if Reclamation determines that there is sufficient evidence and likelihood that the non-Federal cost-share funds will be available to the applicant by the start of the project.

The funding plan must include all project costs, as follows:

**(1) How you will make your contribution to the cost share requirements, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).**

No letters of commitment are required for this project.

**(2) Describe any in-kind costs incurred before the anticipated project start date that you seek to include as project costs. Include:**

**(a) What project expenses have been incurred?**

None

**(b) How they benefitted the project**

None.

**(c) The amount of the expense**

None

**(3) Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.**

N/A

**(4) Describe any funding requested or received from other Federal partners. Note: Other sources of Federal funding may not be counted towards your 50 percent cost share unless otherwise allowed by statute.**

No other Federal partners are involved.

**(5) Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.**

N/A

Please include the following chart (table 2) to summarize your non-Federal and other Federal funding sources. Denote in-kind contributions with an asterisk (\*). Please ensure that the total

Federal funding (Reclamation and all other Federal sources) does not exceed 50 percent of the total estimated project cost.

**Table 2. Summary of non-Federal and Federal funding sources.**

**Table 2. Summary of non-Federal and Federal funding sources**

<b>Funding Sources</b>	<b>Funding Amount</b>
<b>Non Federal Entities</b>	
1. Horsefly Irrigation District In Klamath County, Klamath Basin, Bonanza, Oregon	\$ 202,322 *
<i>Non- Federal Subtotal</i>	\$ 202,322
<b>Other Federal Entities</b>	
1.	
<i>Other Federal subtotal:</i>	\$ 0.00
<i>Requested Reclamation Funding:</i>	\$ 198,300.00
<i>Total Project Funding:</i>	\$ 400,622.00

\*This is a matching contribution of labor and equipment

**Official Resolution**

**Include an official resolution adopted by the applicant’s board of directors or governing body, or for state government entities, an official authorized to commit the applicant to the financial and legal obligations associated with receipt of WaterSMART Grant financial assistance, verifying: An official resolution meeting the requirements set forth above is mandatory.**

An Official Resolution is attached in the Appendix portion of this application as exhibit D.

**K. Budget Proposal**

**(1) General Requirements**

**Include a project budget that estimates all costs (not just costs to be borne by Reclamation). Include the value of in-kind contributions of goods and services and sources of funds provided to complete the project. The proposal must clearly delineate between Reclamation and applicant contributions.**

**(2) Budget proposal Format**

**The project budget shall include detailed information on the categories listed below and must clearly identify all project costs and the funding source(s) (i.e., Reclamation or other funding sources). Unit costs shall be provided for all budget items including the cost of work to be provided by contractors. Lump sum costs are not acceptable. Additionally, applicants shall include a narrative description of the items included in the project budget. It is strongly advised that applicants use the budget format shown on table 3 at the end of this section or a similar format that provides this information.**



The project consists of three major components. Those components are materials, labor and equipment. An itemized breakdown of these costs is included in this report. The wages of the manager and office manager are not separated as indirect costs because of the direct nature of the project. Their time is essential for material and labor coordination as well as other necessary functions of the project. The district manager is also the experienced operator of the equipment needed to complete the installation of pipe and materials for this project. Other items of the budget are the environmental compliance, engineering and the variable frequency drive. The environmental compliance for the project will be requested of Reclamation and the amount is an estimate, the district will obtain specific costs if the grant is awarded. The engineering costs are an estimate and the district will obtain specific costs if the grant is awarded. It is the intent of the District to pay the costs of weirs, head gates, and miscellaneous materials, environmental clearance and any needed engineering.

### **Salaries and Wages**

**Indicate program manager and other key personnel by name and title. Other personnel may be indicated by title alone. For all positions, indicate salaries and wages, estimated hours or percent of time, and rate of compensation proposed. The labor rates should identify the direct labor rate separate from the fringe rate or fringe cost for each category. All labor estimates, including any proposed subcontractors, shall be allocated to specific tasks as outlined in the recipient's technical project description. Labor rates and proposed hours shall be displayed for each task. Clearly identify any proposed salary increases and the effective date.**

Generally, salaries of administrative and/or clerical personnel will be included as a portion of the stated indirect costs. If these salaries can be adequately documented as direct costs, they should be included in this section; however, a justification should be included in the budget narrative.

	Direct	Fringe	Total
Program Manager Don Russell			\$27.00
Employee #2			\$20.00

Direct wages include base wage, Social Security costs and Medicare. Fringe costs include health insurance, life insurance, and retirement costs. No wage increases are anticipated at this time.

<b>Labor Costs</b>	<b>Employee # 2</b>	<b>Manager (emp #1)</b>
Wage	\$ 18.47/hour	\$24.94/hour
Health Insurance	0	0
Life Insurance	0	0
Retirement	0	0
Social Security 6.2%	1.24	1.67
Medicare 1.45%	.29	.39
<b>Total</b>	\$ 20.00	27.00
\$/hour	\$ 20.00	27.00



**Fringe Benefits**

Indicate rates/amounts, what costs are included in this category, and the basis of the rate computations. Indicate whether these rates are used for application purposes only or whether they are fixed or provisional rates for billing purposes. Federally approved rate agreements are acceptable for compliance with this item.

There are no fringe benefits

**Travel**

Include purpose of trip, destination, number of persons traveling, length of stay, and all travel costs including airfare (basis for rate used), per diem, lodging, and miscellaneous travel expenses. For local travel, include mileage and rate of compensation.

None

**Equipment**

Itemize costs of all equipment having a value of over \$500 and include information as to the need for this equipment, as well as how the equipment was priced if being purchased for the agreement. If equipment is being rented, specify the number of hours and the hourly rate. Local rental rates are only accepted for equipment actually being rented or leased for the project. If equipment currently owned by the applicant is proposed for use under the proposed project, and the cost to use that equipment is being included in the budget as in-kind cost share, provide the rates and hours for each piece of equipment owned and budgeted. These should be ownership rates developed by the recipient for each piece of equipment. If these rates are not available, the U.S. Army Corp of Engineer’s recommended equipment rates for the region are acceptable. Blue book, Federal Emergency Management Agency (FEMA), other data bases should not be used.

The equipment costs are based on local contractor rates but all of the anticipated equipment to be used is currently owned by the District. The following table should give a summary estimate of the equipment and time needed.

Equipment					
Excavator	\$120/hr	930	\$111,600.00		\$111,600.00
Backhoe	85/hr	60	5,100.00		5,100.00
D 4 Cat	85/hr	60	5,100.00		5,100.00
Pickup and pipe trailer	70/hr	36	2,520.00		2,520.00
Low Boy – Haul Truck	70/hr	30	2,100.00		2,100.00
Dump Truck	58/hr	36	2,088.00		2,088.00
Tractor and seeder	167/day	1.5 days	250.00		250.00
Misc. (torch, welder, generator, etc.)			7,500.00		7,500.00
<b>TOTAL</b>					<b>136,258.00</b>

## **MATERIALS & SUPPLIES**

Itemize supplies by major category, unit price, quantity, and purpose, such as whether the items are needed for office use, research or construction. Identify how these costs were estimated (i.e., quotes, past experience engineering estimates or other methodology).

Steel for control structures	\$170/unit	12	2,040.00		2,040.00
Seed	\$1/lb	400	400.00		400.00
24" PVC	\$24/ft	1,700 ft		40,800.00	40,800.00
30" HDP	\$31/ft	5,000 ft		155,000.00	155,000.00

Costs are estimated with quotes for seed, pipe and steel.

## **Contractual**

Identify all work that will be accomplished by subrecipients, consultants, or contractors, including a breakdown of all tasks to be completed, and a detailed budget estimate of time, rates, supplies, and materials that will be required for each task. If a subrecipient, consultant, or contractor is proposed and approved at time of award, no other approvals will be required. Any changes or additions will require a request for approval. Identify how the budgeted costs for subrecipients, consultants, or contractors were determined to be fair and reasonable.

HID will be performing all tasks necessary for completion of this project.

## **Environmental and Regulatory Compliance Costs**

Applicants must include a line item in their budget to cover environmental compliance costs. "Environmental compliance costs" refer to costs incurred by Reclamation or the recipient in complying with environmental regulations applicable to a WaterSMART Grant, including costs associated with any required documentation of environmental compliance, analyses, permits, or approval. Applicable Federal environmental laws could include, NEPA, ESA, NHPA, and the clean water act, and other regulations depending on the project..

It is anticipated Reclamation will conduct the environmental compliance.

## **Reporting**

Recipientws are required to report on the status of their project on a regular basis. Failure to comply with reporting requirements may result in the recipient being removed from consideration for funding under future funding opportunities. Include a line item for information on types and frequency of reports required.

Costs for reports were estimated and figured in the costs associated with the project

## **Other**

Any other expenses not included in the above categories shall be listed in this category, along with a description of the item and what it will be used for. Not profit or fee will be allowed.

None

**Indirect Costs**

Show the proposed rate, cost base and proposed amount for allowable indirect costs based on the applicable OMB circular cost principles (See Section III.E., “Cost Sharing Requirement”) for the recipient’s organization

None

**Contingency Costs**

All proposed contingency line-items must be supported by a rationale. Further, in most cases, contingency cost estimates are limited to 10 percent of the projected construction costs.

None known at this time.

**Total Cost**

Indicate total amount of project costs, including the Federal and non-Federal cost-share amounts.

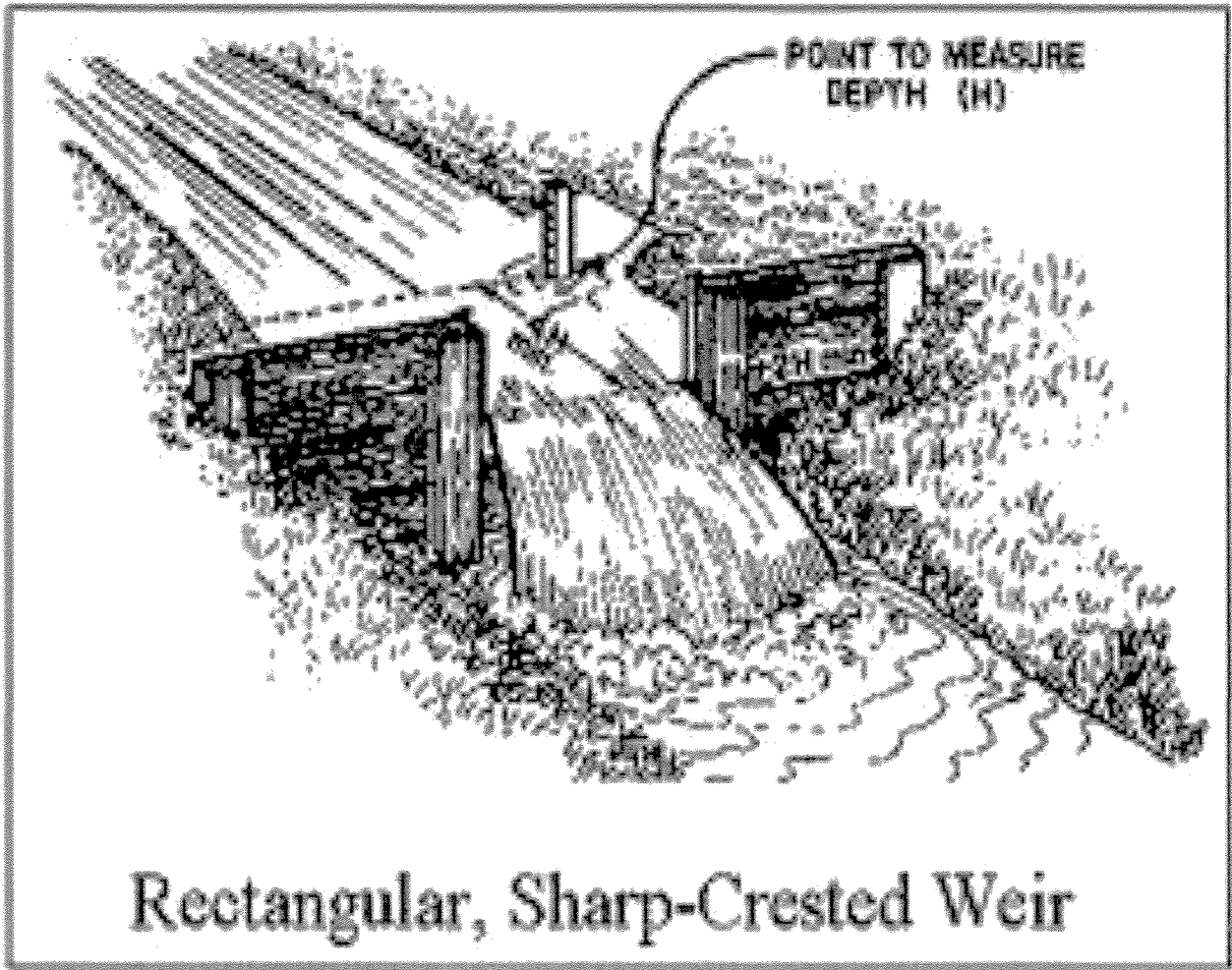
The total project cost is \$400,622.00 with \$198,300.00 coming from Reclamation and the balance (\$202,322.00) being supplied by HID.

**Budget Form**

In addition to the above-described budget information, the applicant must complete an SF-424A, Budget Information---Nonconstruction Programs, or an SF-424C, Budget Information--Construction Programs.

Forms can be found on pages 1-4

Exhibit B









Dairy Canal Location #2 and Yonna Canal Location

Exhibit A



Exhibit A





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# Water Conservation Assessment of Horsefly Irrigation District

A project funded by

**Klamath Soil & Water Conservation District**

for

**Horsefly Irrigation District**

April 1998

Revised August 2006

Completed by

**FloSonics, Inc.**

**CH2MHILL**

PDX17DOC.DOC

Exhibit D

**RESOLUTION 12.3.13**

Whereas the directors of Horsefly Irrigation District during the regular business meeting on December 3, 2013 adopt the following resolution:

Whereas Horsefly Irrigation District being a legal district under Oregon Statute organized in 1911, hereby resolve to continue our participation with the Bureau of Reclamation in regards to conservation efforts within the district.

Whereas the district maintains adequate reserve funding to participate with in kind funding plans.

Whereas the district goal is to maintain our relationship with the Bureau of Reclamation in a fashion that allows the district to meet established guidelines set forth by USBR.

Therefore be it resolved by the board or directors of Horsefly Irrigation District that the general manager, Don Russell, is instructed to carry out any and all such activities.



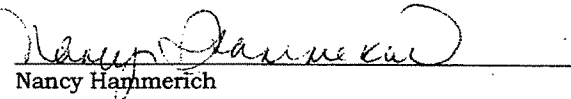
Eric Mockridge, Chairman



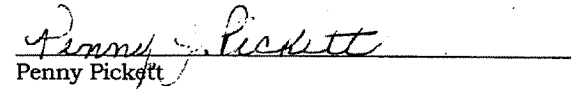
Dave Noble, Vice-Chairman



Earl Wiersma



Nancy Hammerich



Penny Pickett

## Exhibit E

**Horsefly Irrigation District**  
**STATEMENT OF NET ASSETS**  
**June 30, 2012**

### ASSETS

**Current Assets**

Cash and cash equivalents	\$ 202,599
Acreage assessments receivable	5,728
Prepaid expenses	1,359
Inventory of supplies	<u>2,480</u>
<b>Total Current Assets</b>	<u>212,166</u>

**Property and Equipment**

Irrigation and property	986,410
Equipment	<u>234,221</u>
<b>Total</b>	1,220,631
Less provision for depreciation	<u>(694,775)</u>
<b>Total Fixed Assets</b>	<u>525,856</u>
<b>Total Assets</b>	<u>\$ 738,022</u>

### LIABILITIES AND NET ASSETS

**Current Liabilities**

Accounts payable	35,063
Payroll liabilities	1,505
Deferred revenue	<u>75,164</u>
<b>Total Current Liabilities</b>	111,732
<b>Total Liabilities</b>	<u>111,732</u>

**Net Assets**

Invested in capital assets, net of related debt	525,856
Unrestricted	<u>100,434</u>
<b>Total Net Assets</b>	<u>\$ 626,290</u>

See accompanying notes and independent accountant's review report

Exhibit F

HORSEFLY IRRIGATION DISTRICT  
General Business Meeting Agenda  
January 7, 2014

Call meeting to order at 5:30 PM  
Oath of Office—Eric Mockridge & Dave Noble  
Elect Chair and Vice Chair for 2014

Adopt December 3, 2013 monthly minutes.

PROJECTED INCOME:

Service Invoice	\$ 170.00
O&M past due	\$ 41,150.67
Past Due Lift	<u>\$ 2,182.21</u>
Total projected Income	\$ 43,502.88

CHECKING AND SAVINGS ACCOUNTS (Balances 01/07/2014)

KPEFCU Savings – 03: (special projects)	\$ 38,595.91
KPEFCU Savings – 00	\$ 18.35
KPEFCU Savings – 01	\$ 174,291.45
KPEFCU Checking:	\$ 4,115.86
Undeposited Funds	\$ 4,177.82
Petty Cash:	<u>\$ 118.41</u>
<b>TOTAL:</b>	<b>\$ 221,317.80</b>

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# The new standard in drainage pipe

Every day for more than 30 years, Advanced Drainage Systems corrugated high density polyethylene (HDPE) pipe has been building its reputation for economy, durability, and superior performance in gravity-flow drainage applications. During the 1970's and 1980's, ADS single wall pipe became the preferred product for agricultural, mining, turf/recreation, and residential drainage markets.

## N-12<sup>®</sup> Pipe (4" - 42")

The hydraulic capabilities of the product were significantly improved in 1987 when ADS introduced the first HDPE drainage pipe to combine an annular corrugated exterior for strength with a smooth inner wall for maximum flow capacity. Named for its excellent Manning's "n" rating of 0.012, N-12 pipe was designed specifically for storm sewers, highways, airports, and other engineered construction. Through extensive field and university testing, ADS engineers were able to refine the corrugated

wall design for successfully larger diameters without compromising the pipe's excellent strength-to-weight ratio. Its performance and economy have led to rapid acceptance by contractors and engineers, and official approval by most state and municipal agencies.

## N-12 ProLink Ultra<sup>®</sup> Pipe (12" - 42")

In 1997, ADS incorporated a flush gasketed bell-and-spigot joint into each section of the popular storm sewer sizes of N-12 pipe. This design eliminates the need for separate couplings and the excavation of bell holes in the trench. The joint is silt-tight, and its quick and easy installation has led to instant acceptance by contractors across the country.

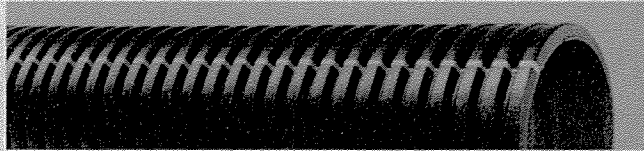
## N-12 HC<sup>®</sup> Pipe (42" thru 60")

Soon after the introduction of N-12 pipe, ADS engineers began a major program to develop an alternative wall

profile that would provide superior strength, stiffness, and production efficiencies. An 8-year development and testing program produced a revolutionary pipe design called N-12 HC. The pipe features smooth inner and outer walls, and a unique "honeycomb" wall section using closely spaced circular ribs that brace the pipe circumferentially for added ring stiffness and structural strength. Soil loading tests at Utah State University indicate that N-12 HC pipe may have the most stable wall profile ever manufactured for large diameter flexible pipe.

## Applications

N-12 and N-12 ProLink Ultra pipe meet the requirements for Type S pipe under AASHTO M 294, and N-12 HC qualifies as Type D pipe. All products can be specified for culverts, cross drains, storm sewers, landfills, and other public and private construction.

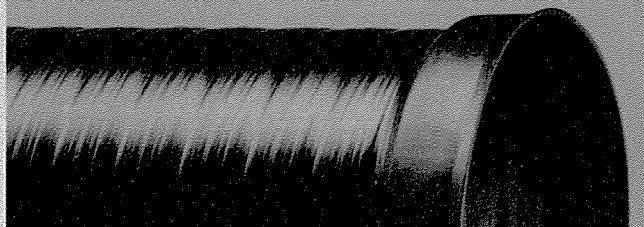
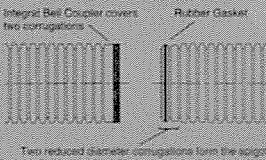


**N-12<sup>®</sup> Pipe (4" - 42")**

The first corrugated High Density Polyethylene drainage pipe with a smooth inner wall for superior hydraulics and maximum flow capacity.



**N-12<sup>®</sup> ProLink Ultra<sup>®</sup> Pipe (12" - 42")**



**N-12 HC<sup>®</sup> Pipe (42" thru 60")**

N-12 HC's innovative "honeycomb" wall section draws on the structural strengths of the circle, the I-beam, and the classic arch.

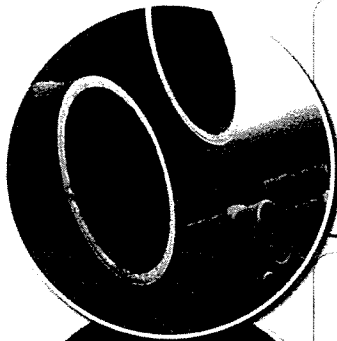


## Exhibit H



# IRRIGATION P.I.P

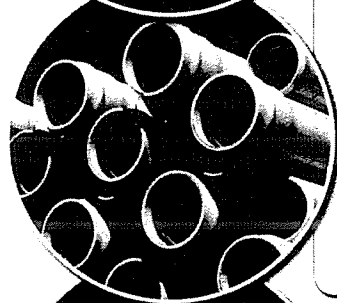
MEETS ASTM D1785 CELL CLASS 12454; GASKETS MEET ASTM F477;  
JOINTS MEET ASTM D3139. PRODUCED IN ACCORDANCE WITH NRCS 430-DD;  
ANNEX A1 OF ASTM D2241



### APPLICATIONS

JM Eagle's Irrigation PIP pipes can be used for:

- Underground pipe mains and laterals for permanent, solid-set sprinkler irrigation systems using hand move, drag line or fixed sprinkler laterals; and mechanical move systems such as center-pivot, self-propelled sprinkler units, "big gun" sprinklers or tower-mounted sprinkler booms.
- Underground pipe mains for flood, furrow or drip irrigation systems.
- Underground tail water return (pump back) lines for recovery of water runoff from flood or furrow irrigation systems.



### DESCRIPTION

JM Eagle's PIP Irrigation pipe is made in compliance with industry-accepted irrigation pipe standards. It is produced in accordance with the Natural Resources Conservation Service NRCS 430-DD specification and dimensionally complies with Annex A1 of ASTM D2241.

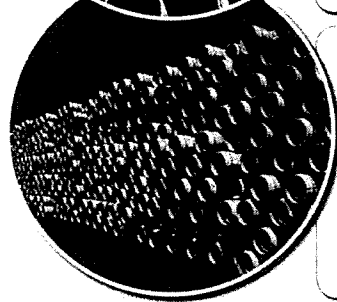
The pipe is available in DR 64 (63 psi), DR 51 (80 psi), DR 41 (100 psi), and DR 32.5 (125 psi). The design of the pipe allows for a long-term 2-to-1 safety factor at the marked capacity of the pipe.

The standard laying length of Irrigation PIP PVC water pipe is 20 feet.

The pipe can be directed to most existing irrigation equipment. It can also be connected to IPS cast- or ductile-iron fittings with the appropriate adapters and/or transition fittings.

JM Eagle Irrigation PIP pipe comes with Ring-Tite joints and two other types of gaskets, depending on plant production. JM Eagle gaskets meet or exceed ASTM D3139 for joint tightness, including a 22-inch Hg vacuum for one hour, under deflection with no leakage.

Also available in 15-inch Solvent Weld for elevator sleeving.



### BENEFITS

Due to its long laying lengths of 20 feet, Irrigation PIP PVC water pipe reduces the cost of multiple joints and allows for more ground to be covered during installation. Irrigation PIP pipe:

- Maintains performance against tuberculation, corrosion and external galvanic soil conditions without lining wrapping, coating or cathodic protection.
- Keeps its smooth interior over long years of service with virtually no loss in carrying capacity, allowing for savings in pumping costs, as well as savings on the size of the pipe required.
- Can be field-cut with a power saw or ordinary handsaw without the use of expensive or complicated machinery.

Revised 10/22/2012. This information may have been updated. Please download the latest version at [www.jmeagle.com/onesheets](http://www.jmeagle.com/onesheets).

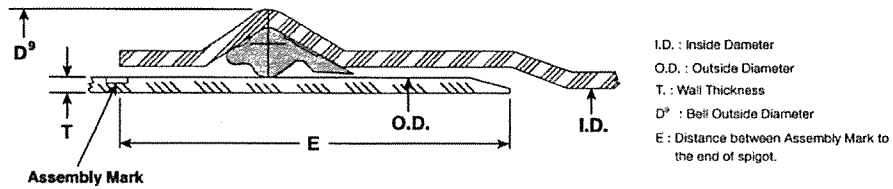
PLEASE CONTACT YOUR JM EAGLE REPRESENTATIVE OR VISIT [WWW.JMEAGLE.COM](http://WWW.JMEAGLE.COM) FOR MORE INFORMATION.

# Exhibit I



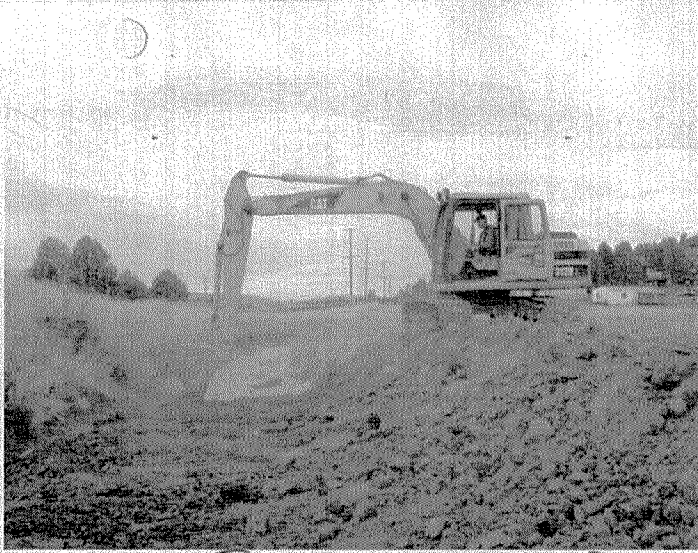
PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D <sup>o</sup> (IN)	APPROX WEIGHT (LBS/FT)
Rated 125 psi (SDR 32.5)*						
6	6.140	5.74	0.189	4.81	6.90	2.40
8	8.160	7.63	0.251	5.52	9.16	4.16
10	10.200	9.53	0.314	6.64	11.46	6.53
12	12.240	11.44	0.377	7.02	13.75	9.43
15	15.300	14.30	0.471	7.25	17.18	14.86
18	18.701	17.48	0.575	8.00	21.00	22.27
21	22.047	20.61	0.678	9.50	24.76	31.03
24	24.803	23.19	0.763	9.60	27.86	41.06
27	27.593	26.12	0.860	10.10	31.41	51.41

\* Prior to ordering or specifying, please consult JM Eagle™ for product and/or listing availability.  
 \*\* O.D. dimensions conform to plastic irrigation pipe (P.I.P.) sizes.



Product Standard: NRCS-430-DD  
 ASTM D2241 ANNEX  
 Pipe Compound: ASTM D1784 Cell Class 12454  
 End Finish: Belled End  
 Pipe Length: 20 feet laying length  
 Installation: JM Eagle™ Installation Guide

Exhibit J



*Dairy Canal Pre Grading  
2010*

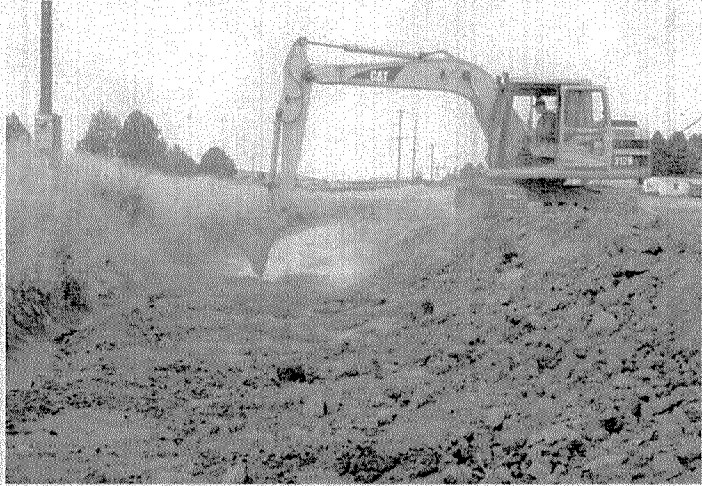
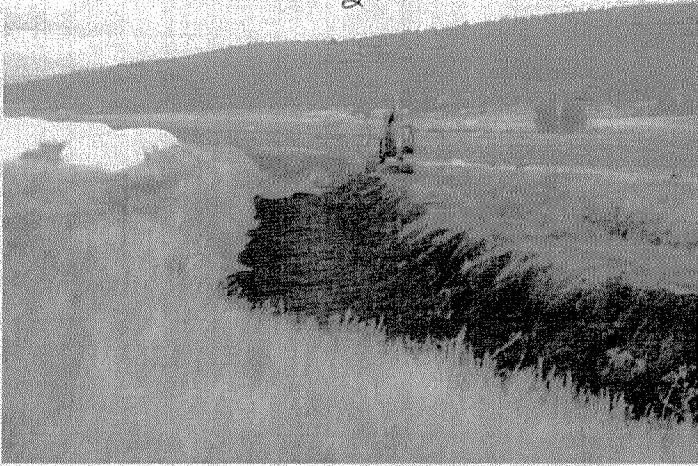
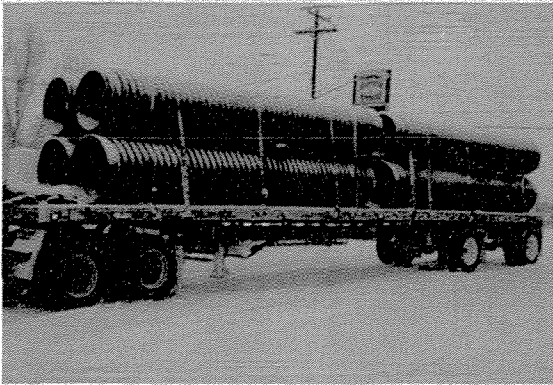
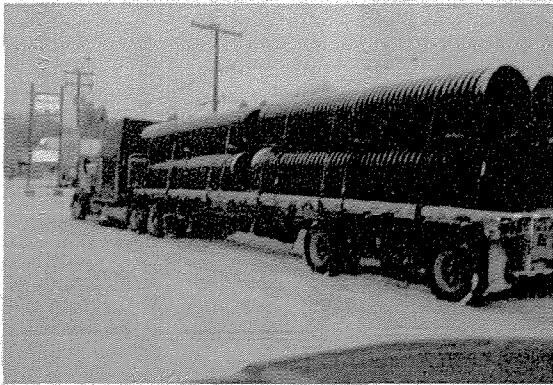




Exhibit K



*Daily Canal Pipe 2010*