Horsefly Irrigation District
Horsley Canal and Somers Canal Piping Project

WaterSMART Water and Energy Efficiency Grants FY 2016

Funding Opportunity No. R16-FOA-DO-004

By

Horsefly Irrigation District
Klamath Basin, Oregon

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Horsefly Irrigation District
Klamath Basin, Oregon

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(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 Appendix 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 sytem 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 (see Appendix B), 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,
  - Horsley Project in 2009
  - Somers Project in 2009
  - Armstrong Projects in 2009
  - Dairy and Yonna Canals in 2014

  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 8,900 feet of open canal to a piped system. If this application is awarded HID would purchase a total of 8,900 feet of pipe. The first location, Horsely Canal, would include 6,000 feet of 30" HDPE and 1,800 feet of 24" PVC. On the second location, Sommers Canal, would include 1,100 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 HDPE or concrete cleanouts will be and installed within the canal. These cleanouts are round structures that will be fitted around the pipe and have the ability to measure flow. 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?**

25,000 acre feet.

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

Once water is used for irrigation purposes and is recycled through the sytems, 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 form 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. HDPE and concrete control structures for control and measurement of water flow.

(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.

- **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?**

  By piping the canal, seepage would be eliminated.

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

  The HDPE and concrete structures that will be installed will allow for better measurement of flow.

(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 district's annual water supply is 25,000 acre-feet per year, the Horsley Canal will show a savings of 420 acre- feet, the Somers Canal will show a savings of 300 acre-feet.

  Estimated amount of water being better managed 420 + 300 = 720
  Average annual water supply 25,000 = 34.7%

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:

Estimated Amount of Water Conserved **720**
Average Annual Water Supply 25,000 = 34.7%

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:

443,355.00 Project Cost
(720 Acre-Feet Conserved, x 50 Years Improvement Life) = $12.32/af/yr

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 the 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. Converting canal to pipeline reduces the need for pumping, and pumps can be retired which ultimately will reduce kilowatt consumption. 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 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).

HID is at this time investigating the feasibility of solar panels.

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 Basin. The Lost River Sucker and the Short Nosed Sucker are both are listed as endangered species. If the Horsefly Irrigation District is diligent in its effort to preserve wat resources, this water becomes carryover in Clear Lake (which is a rarity), 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:

(1) 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)?**

  This project will conserve water within the Klamath Project that would support listed species in the Lost River.

- **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 water users 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 area/region.

- **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?**

  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 water users 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.**

The district is experiencing an ongoing improvement in irrigation methods that includes pivots, linears, updated wheel lines. Piping provides a consistent and improved supply of water to the water user. The water is cleaner than supplied by open canals and the discharge constant. This also allows district management to provide water to water users in a more timely fashion.

- **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 water users will convert current practices of gated and flood irrigated pastures to pivot irrigated.

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

Modern technology allows the water user 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. Whereas the previous application required a 50 to 60 horsepower motor.

- **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 sec ft / ac minimum is 640 ac/ft per year + labor. A pivot will reduce their demand for water by 50% per year – by covering 100% of the land with less water. A reduction from 4 cfs to 1 cfs would be achieved.

- **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. Water users 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:

(1) 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.

(2) 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.

(3) 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.

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 (dependent on NEPA/NHPA compliance)
January 2016 - Submit grant application
September 2016 – Anticipated Grant is awarded
October 2016 – Begin NEPA and cultural resources process
March 2017 - Anticipated finalization of compliances
March 2017 - HID request final bids for pipe
September 2017 - Purchase Pipe and materials
October 2017 - March 2018 - (weather dependent) - First phase of construction
October 2018 – March 2019 – (weather dependent) – Second phase of construction
November 2019 – 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).
Note: all waterSMART Grant applicants are required to propose a "performance measure" (a method of quantifying the actual benefits of their project once it is completed). A provision will be included in all assistance agreements with WaterSMART Grant recipients describing the performance measure, and requiring the recipient to quantify the actual project benefits in their final report to Reclamation upon completion of the project. If in formation regarding project benefits is not available immediately upon completion of the project, the financial assistance agreement may be modified to remain open until such information is available and until a Final Report is submitted. Quantification of project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of WaterSMART Grants.

Historically and currently, HID does not divert water prior to the demand of the irrigation season. So conservation is maximized. The performance measure for the 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.

The District will continue to use performance measures based on past experience of historic inflows and outflows. Any piped canal provides that section with 100% water savings.

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

Up to 4 points may be awarded if the proposed project is in a basin with connections to Reclamation project activities. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.

(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.

(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 native 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 District's 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. Horsefly Irrigation District 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.

Horsefly Irrigation District will commit to $237,685.00 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 $474,045.00 with $236,360.00 requested under WaterSMART.

(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?

N/A

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 b 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.

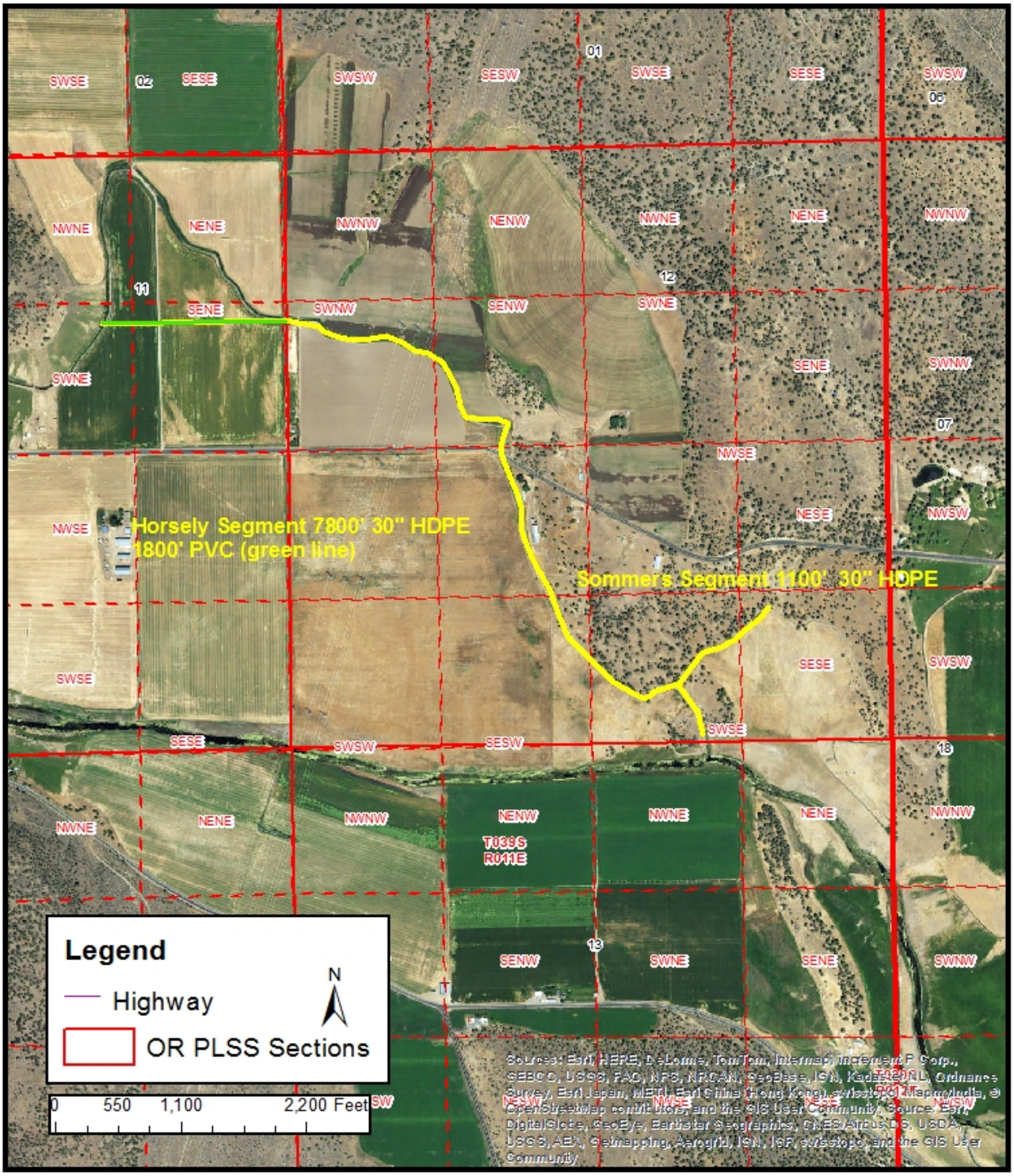
(5) Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.

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.

APPENDIX A

HID WaterSMART Project Location



APPENDIX B

REPORT

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

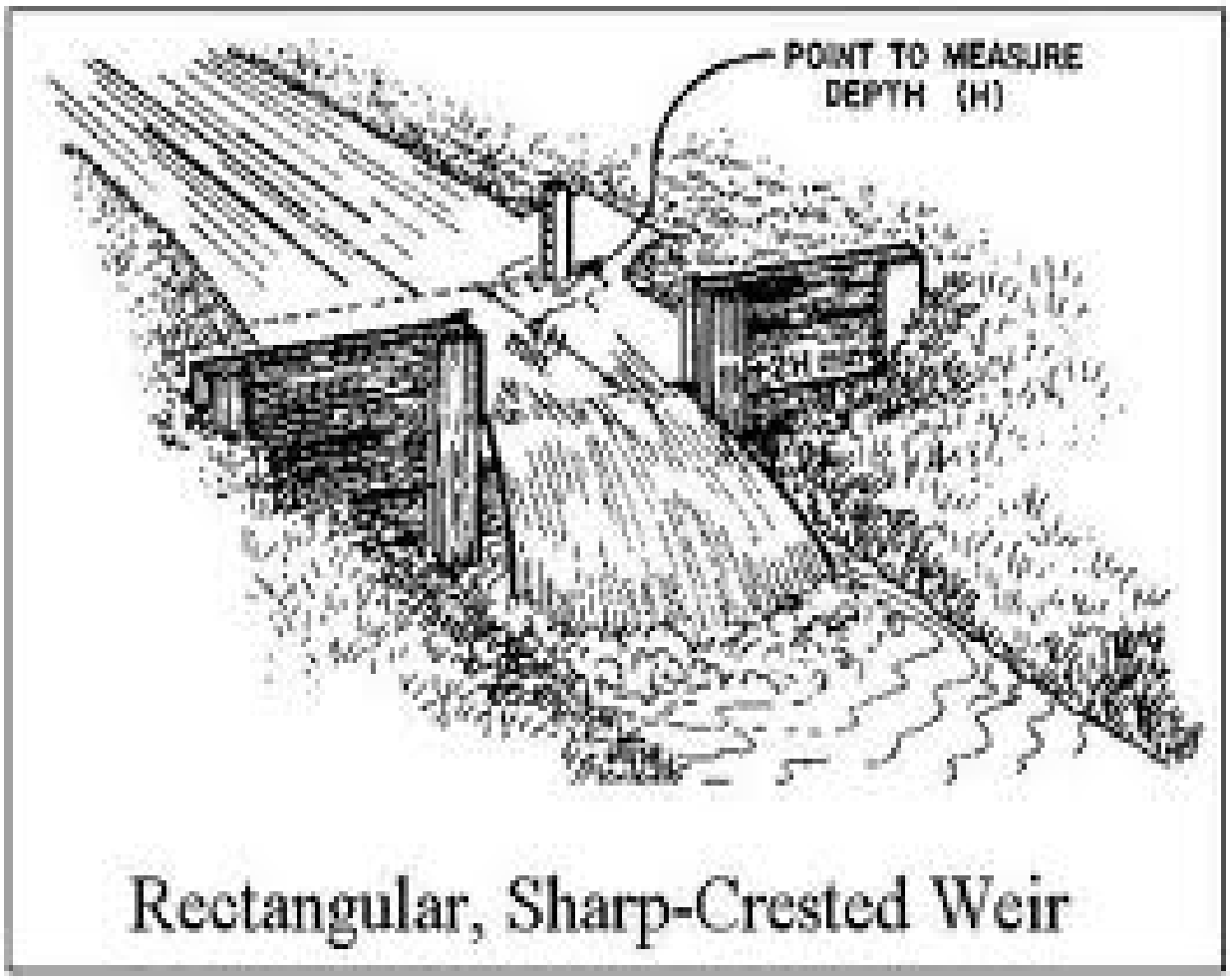
Completed by

FloSonics, Inc.

CH2MHILL

PDX17DOC.DOC

APPENDIX C



Rectangular, Sharp-Crested Weir

APPENDIX D

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® 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*® Pipe (12" - 42")

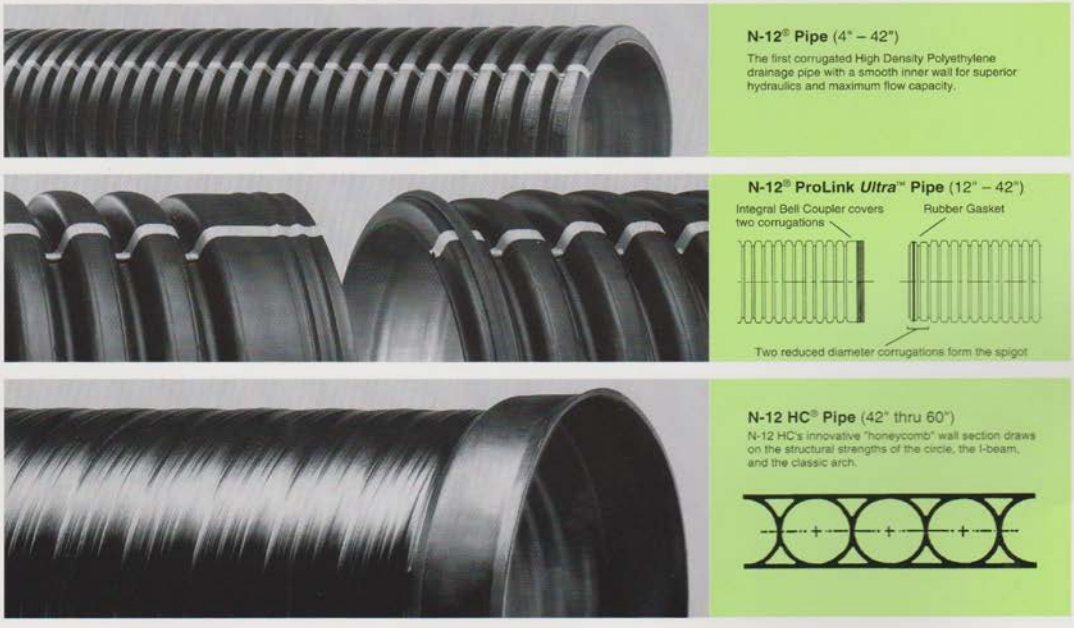
In 1997, ADS incorporated a flush gasketed bell-and-spigot joint into each section of the popular storm sewer sizes of N-12 pipe. This design eliminates the need for separate couplings and the excavation of bell holes in the trench. The joint is silt-tight, and its quick and easy installation has led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

N-12 HC® 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.



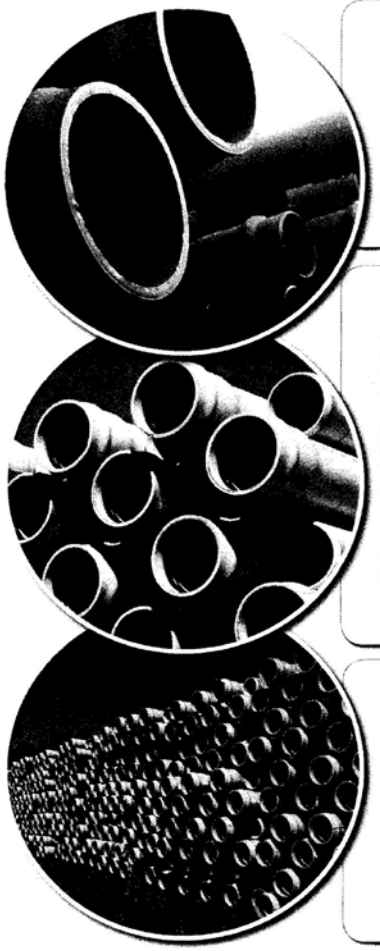
2

JM Eagle™

Building essentials for a better tomorrow™

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.

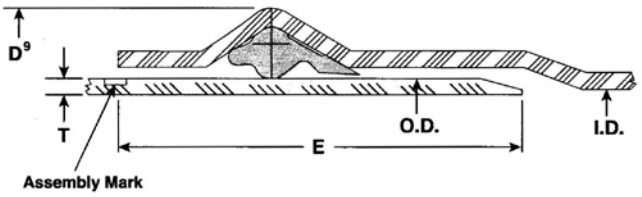
PLEASE CONTACT YOUR JM EAGLE REPRESENTATIVE OR VISIT WWW.JMEAGLE.COM FOR MORE INFORMATION.

JM Eagle *Building essentials for a better tomorrow™*

PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D⁹ (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 availablity.

** O.D. dimensions conform to plastic irrigation pipe (P.I.P.) sizes.



I.D. : Inside Dameter
O.D. : Outside Diameter
T. : Wall Thickness
D⁹ : Bell Outside Diameter
E : Distance between Assembly Mark to the end of spigot.

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

APPENDIX F

RESOLUTION 1.13.16

Whereas the directors of Horsefly Irrigation District on January 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 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