WATERSMART: WATER AND ENERGY EFFICIENCY GRANTS FOR FY 2016

TUNNEL 2 LINING PROJECT

HUNTLEY PROJECT IRRIGATION DISTRICT

Funding Opportunity Announcement No.

R16-FOA-DO-004

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1.0 EXECUTIVE SUMMARY

The applicant, Huntley Project Irrigation District (HPID), is located in Yellowstone County, Montana, 10 miles east of Billings, Montana running along the south side of the Yellowstone River. HPID includes the towns of Huntley, Worden, Ballantine, and Pompey's Pillar. The HPID is a USBR facility built in 1905 to serve 32,500 acres of irrigable land between Huntley and Pompey's Pillar. The now system serves over 800 landowners, irrigating nearly 30,000 acres of prime irrigated agricultural ground.

The Tunnel 2 Lining Project includes the installation of 1,623-feet of tunnel lining to minimize seepage losses and improve irrigation conveyance efficiency through the deteriorating Tunnel 2 on the Main Canal. The improvements will correct a major operational inefficiency within the system and start to minimize seepage losses at the head of the delivery system. The project will conserve water through elimination of seepage losses through Tunnel 2 while also improving flow characteristics in the Main Canal leading to reductions in seepage losses and wasteway overflows. District measurements identified 28,227 acre-feet of water loss annually through the Tunnel 2 area. The proposed improvements will directly account for a seepage loss reduction of 6,558 acre-feet of water lost annually directly contributed to Tunnel 2. Associated water management improvements will further facilitate operational efficiencies directly related to water level regulation and wasteway spill volumes. Due to the severe losses in the Tunnel 2 reach system operators have to regulate canal water levels by wasting approximately 70 cfs during operation throughout the head of the system. Implementation of the Tunnel 2 improvements will be the first phase of a three phased water conservation project which will include canal lining upstream and downstream of Tunnel 2. Water conservation from the project will increase instream flows in the Yellowstone River benefitting the Pallid Sturgeon and Whooping Crane, both endangered species in the Yellowstone River along with numerous migratory bird. The project will include the implementation of water measurement at the head of the system to quantify and identify water conservation. Tunnel 2 work is scheduled to begin in the fall of 2016 and will be completed by December 2017. Construction is estimated to take two construction seasons due to the shortened construction season in Montana.

2.0 BACKGROUND

2.1 Irrigation District Description and Location

The Huntley Project Irrigation District (HPID) is located along the Yellowstone River east of Billings, Montana. HPID canals stretches approximately 27 miles west to east along the southern banks of the Yellowstone River through the towns of Huntley, Worden, Ballantine, and Pompey's Pillar. The intake for the HPID is located at latitude 48.875° North and longitude 108.345° West. A map of the proposed project area and its relationship to the Yellowstone River and Huntley, Montana is shown in Figure 1 on Page 2. The HPID currently serves nearly 30,000 acres of irrigated farmland owned and operated by over 800 family farms. Irrigators in the HPID primarily raise alfalfa, sugar beets, corn, and small grains such as wheat and malt barley. The HPID infrastructure was constructed by the United States Bureau of Reclamation (USBR) in the 1905 and was officially operational in 1908. HPID entered into contract with the USBR in 1927 to complete operation and maintenance of the overall project. The HPID maintains a water right, in joint with the USBR, from the Yellowstone River to irrigate the acres within the District. The flow rate specified in the water right amounts to approximately 750 cfs.

This application deals specifically with the head of the HPID system and specifically the Tunnel 2 area directly below the Diversion Dam. The head of the HPID system consists of a diversion dam in the Yellowstone River, three main canal tunnels, and a siphon for the main canal under Pryor Creek. All of the structures noted occur before any water is applied for irrigation within the District. Tunnel 2, located approximately 2,900-feet from the intake, and has been identified by the HPID as the primary rehabilitation and water conservation project within the HPID system. The District has worked diligently to address water losses and seepage throughout the delivery system in an effort to increase delivery efficiency and increase water conservation within the HPID. In 2013, the HPID began actively monitoring water losses through the system and focused on documentation of water losses at the head of the system. From the intake through the Main Canal to the Pryor Creek Siphon water measurements document up to 140 cfs in seepage losses during conveyance. This application will address the 1,623-feet of Tunnel 2 and its impacts on the Main Canal and water level regulation in the Main Canal.

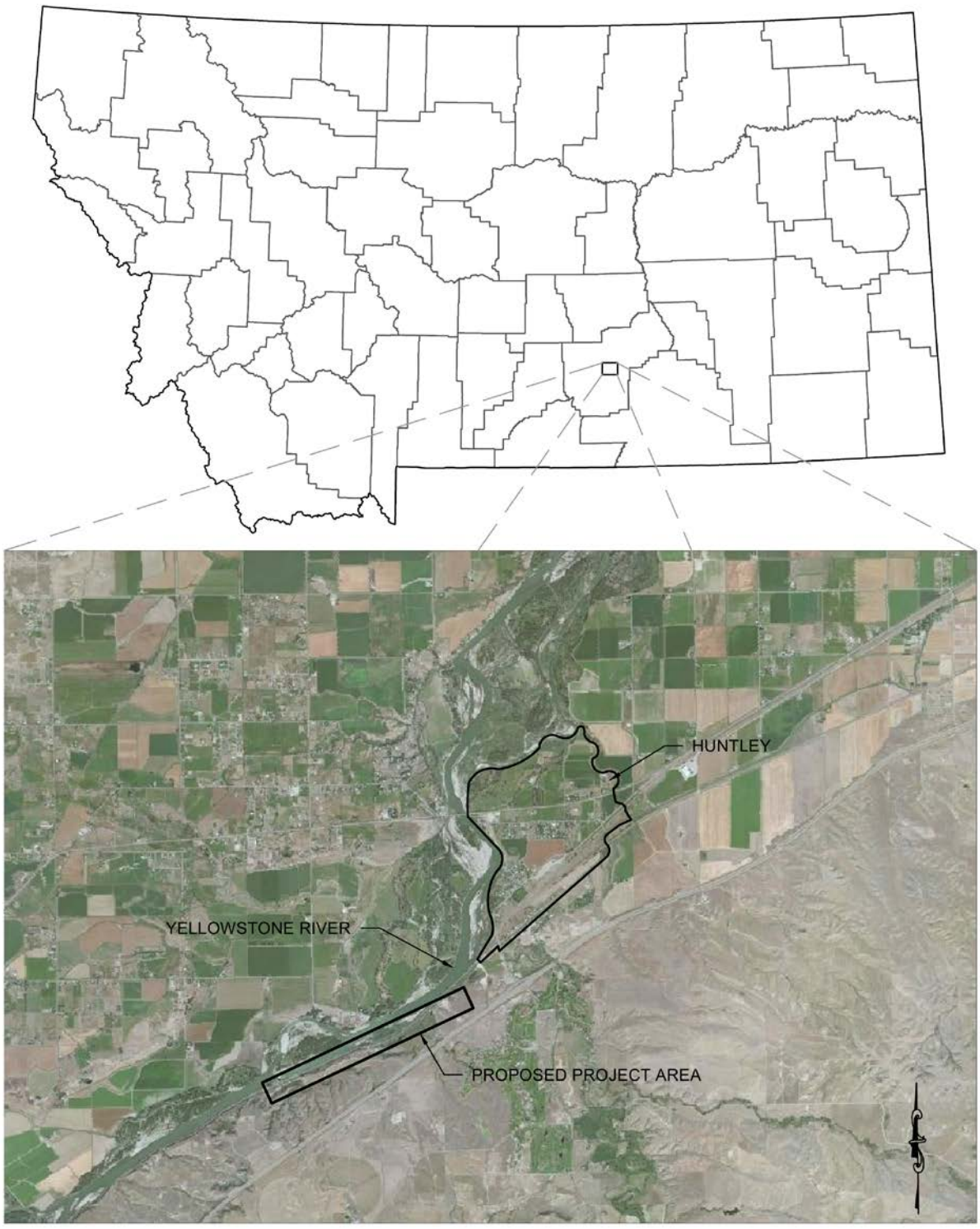

Figure 1. General Location Map

2.2 System Infrastructure

The HPID infrastructure consists of gravity canals and laterals fed through a diversion dam directing water from the Yellowstone River into the delivery system. The HPID system contains 20 miles of main canal, 22 miles of carriage canal, 202 miles of laterals, and 187 miles of drains along with a 400 acre-foot off-stream storage reservoir. The Highline Canal is located approximately 14 miles from the diversion which is fed through two hydraulic turbine driven pumps mounted in a drop on the Main Canal. The pumps lift 100 cfs up to the Highline Canal which services a large portion of the District.

The District has placed an emphasis on water conservation, reducing seepage losses, and increasing delivery efficiency. Over the last 10 years the District has completed a number of projects funded primarily through their per acre assessments. The District set up a dedicated Construction Fund of which $2.00 per acre is contributed annually to help fund water conservation projects within the HPID. Below is a list of the major water conservation projects the District has completed recently.

- Converted 1 mile of lateral to pipeline (east end of District)
- Replaced ¾ mile of overshot pipe (east end of District)
- Converted ½ mile of Lateral G to pipeline (east end of District)
- Removed over 3,000 cubic yards of silt at Anita Reservoir (east end of District)
- Sealed two 50" x 200' pumping plant intake lines (east end of District)
- Replaced 1935 Ballantine drain pump (west end of District)
- Re-graded and rip-rapped ¼ mile of Main Canal at head end for flow, seep, & erosion (west end)
- Converted ¾ mile of lateral to pipe on Road 9 (west end of District)
- Converted ½ mile of lateral to 18” pipe at Smiths (east end of District)
- Replaced 800' of 24" Extension Line Siphon (east end of District)
- Replaced 1905 Fly Creek Crossing structure (west end of District)
- Converted ¼ mile of lateral to 18” pipe on C-03 (west end of District)
- Converted ¼ mile of lateral to 18” pipe on C-02+2 (west end of District)
- Converted ½ mile of lateral to 12” pipe on E-02 (west end of District)
- Converted ½ mile of lateral to 15” pipe on E-02 (west end of District)
- Installed ½ mile of liner in Lower Canal (east end of District)
- Converted 800’ of lateral to 36” pipe on Main E (west end of District)
- Extended 100’ of 36” pipe at the Fly Creek Siphon (east end of District)
- Extended ½ mile of 15” pipe on the Reservoir Line (east end of District)

The remaining open canal and lateral delivery system however has become overgrown

with vegetation and are generally inefficient delivery infrastructure due to conveyance losses and seepage losses. The District actively works both during and after the season to address vegetative overgrowth and delivery efficiency issues which has included a number of smaller projects not listed. Having addressed a large number of smaller seepage and water conservation projects the District is focused and committed to addressing the larger water conservation projects within the District, the Tunnel 2 area being chief among them.

2.3 Project Purpose and Objective

This project is a remediation and conservation project targeting the Tunnel 2 area and the head of the delivery system. The overall objective of the project is to eliminate seepage within the tunnel and reduce seepage and system inefficiencies which are currently contributing to further water loss in the system. Through completion of the primary objective two additional objectives will be achieved. First, overall irrigation efficiency will be improved, resulting in further water conservation associated with the delivery of irrigation water through the system. Secondly, a reduction in seepage loss upstream of Tunnel 2 will result from improvement of the flow characteristics of the Main Canal.

Since 2013 the HPID has worked with USBR field staff to monitor water losses through the Main Canal area to determine the extents of water loss at the head of the system. The USBR worked with the District to measure water flows at various sections along the Main Canal. During the field test, no spills or diversion were made in order to isolate the volume of water being lost through the Tunnel 2 area. These field measurements, in combination with the Main Canal's soil data in the Tunnel 2 area, allowed the HPID to accurately calculate the volume of water lost through the Tunnel 2 area of the system. Measurements identified up to 140 cfs of water loss from the diversion to Tunnel 3 in the Main Canal.

The proposed Tunnel 2 Lining Project will include the installation of 1,623-feet of lining installed through the extents of Tunnel 2. ***The field measurements of water loss in the section of Main Canal directly impacted by Tunnel 2 show up to 70 cfs of seepage directly upstream.*** The losses were calculated using open channel water measurements at specified sections of the canal. Using canal geometry and velocity profile readings

throughout the control sections the corresponding flow regime was created. As mentioned earlier, measurements were taken while the canal was flowing prior to the release of any water between the measurement reach. Because there were no releases between the measurements the loss was calculated as the difference between flows at the upstream and downstream stations. ***Additional calculations were made based on the characteristics of Tunnel 2 which conservatively identified 3 cfs of loss within the tunnel itself.*** These calculations were made using soils data along with water flow rates and hydraulic modeling. The Tunnel 2 Lining Project will improve flow characteristics of the upstream canal by reducing head in the canal and improving velocities through the Tunnel 2 area. Using hydraulic modeling and water loss measurements it was conservatively calculated that implementation of the Tunnel 2 improvements would reduce upstream seepage by nearly 16.5 cfs. ***Hydraulic modeling and water loss measurements show that the Tunnel 2 Lining Project will conserve up to 6,558 acre-feet of water annually.***

2.4 Financial Ability – Federal Assistance Necessary

The HPID is made up of small family farms and landowners making up the District. Typical crops grown within the District include small grains, malt barley, alfalfa, corn, and sugar beets. The District has an overall budget of approximately $1,131,000 to cover O&M, repairs, conservation projects, staff wages, benefits, and a the USBR mandatory reserve fund. When large construction projects such as this present themselves, typically the District's only financial option is to go to the Montana Department of Natural Resources and Conservation or a local bank and take out a loan to cover the project costs. This funding method substantially increases irrigation fees within the District to repay the loan. Currently the standard fee for irrigation water within the District is $39 per acre. The $39 per acre fee is one of the highest rates in Montana. The increase in farming input and equipment costs, combined with the recent decline in market commodity prices, the members of the District cannot support a further increase in water fees to pay for full construction.

Along with USBR funding assistance, the District has committed to procuring loan financing from either state, federal, or local financial institutions. The District has had

conversations with the Renewable Resource Grant and Loan Program through the Montana Department of Natural Resource Conservation (DNRC), local agricultural businesses like Coors, and local financial institutions. Should the District not receive funding from the USBR, the scope of the Tunnel 2 Lining Project will be required to be scaled back. The District will install as much lining as the budget allows for depending on award from the USBR.

2.5 Project Need – Legal Order

The HPID is not under any state or federal order to reduce water consumption or mitigate seepage losses. The District has undertaken the project by choice to improve their beneficial use of Montana's water resources and increase irrigation efficiency. Water conservation is a priority for the HPID for a number of reasons, operational efficiency and cost savings being chief amongst them. The District is taking proactive steps to aggressively curtail water losses within its system due to seepage in the hopes that it will not come under state or federal order to do so in the future. The HPID will continue to pursue water conservation projects to improve irrigation efficiency within the District and partner with state and federal entities when appropriate.

2.6 Past Project Coordination - USBR

The HPID is partner district with the USBR, jointly holding title to the water rights for the District. HPID recently partnered with the USBR in 2011 to repair flood damage to the Pryor Creek Siphon downstream of the Tunnel 2 area. The District used the PL 111-11 program to loan $1,000,000 for the repair and replacement of the siphon (Loan Number BD1205606702). The emergency repairs to the siphon were completed without significant interruption to the irrigation season due in part to the partnership and coordination between the USBR and HPID. The working relationship between the USBR and HPID has been valuable and crucial in the completion of water and energy conservation projects.

2.7 Contact Information

The primary point of contact for this project will be Todd Wilson, Manager of the HPID. Mr. Wilson will serve as the Project Manager for the Tunnel 2 Lining Project, overseeing

engineering and construction. The contact information for Mr. Wilson is below.

Todd Wilson, District Manager
2291 2nd St. West
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3.0 TECHNICAL PROPOSAL

3.0.1 Overall Scope of Work

An engineering analysis has been completed on the Tunnel 2 Lining Project by Performance Engineering and Consulting (PEC). In the analysis three alternatives were analyzed for lining or opening up the Tunnel 2 section of the Main Canal. The HPID chose to precede forward with the preferred alternative which included installation of approximately 1,623-feet of tunnel lining using a combination of steel multi-plate and concrete walls. Formal design and permitting of the project has not yet been completed but is included in the proposed project budget. The existing site map can be seen in Exhibit E-1.

Working with PEC, the HPID has identified the preferred alternative to be installation of a stem wall and steel multi-plate structure through the extents of the tunnel. An inspection of Tunnel 2 was completed by PEC in October, 2015. The inspection identified severe fissures and cracking throughout the tunnel from the floor to the ceiling. These fissures and cracking are the source of water loss in the tunnel itself and are further weakening the structure. The preferred alternative will include continued use of the existing inlet and outlet structure of the tunnel and the existing concrete floor. The existing inlet and outlet works will be modified slightly to tie the new interior to the headwall structure but will remain primarily as they are. The tunnel floor consists of a concrete pad which will be used as the floor of the proposed improvements. Lining the tunnel will be completed in a four phased process. First the existing floor will be cleared of all debris with all cracks or spalling repaired to create a smooth floor surface. Second, concrete stem walls will be

installed on each side of the tunnel to a height of approximately 4.5 feet. The stem walls will be doweled to the floor and tied together with the appropriate rebar mats. The top of the stem walls will include a guide channel for the steel multi-plate to slide along into its final place. Third, prefabricated steel multi-plate structures will be constructed outside the tunnel and placed in the tunnel guide channels at the entrance of the tunnel. The multi-plate will then be pulled/pushed into place through the tunnel and fastened to the concrete stem wall. Fourth and finally, flowable fill will be used to fill the annular space between the stem wall and multi-plate structure and the existing tunnel walls and ceiling. Flowable fill will be added as the multi-plate is placed in phases. The flowable fill will add structural stability to the liner structure as well as serve to reduce the potential for damage from falling debris in the tunnel itself. Concrete cutoff walls will be installed periodically to eliminate the potential for seepage channeling/piping behind the liner structure. See attached Exhibits E-2 and E-3 for typical sections and projected site disturbance areas.

The liner structural dimensions shown in the previously mentioned exhibits and description above are preliminary in nature as design has not been completed. Base hydraulic modeling was however completed to ensure that the dimensions proposed are conservative and close to what will likely be the design dimensions. This was done to ensure project budgeting could be done in a conservative manner. The alignment will not change from what is shown in the exhibits however stem wall dimensions and multi-plate size may vary slightly to best fit the field conditions during design. It is important to note the Tunnel 2 Project has only been preliminarily designed and will go through final design if funding is granted.

The Tunnel 2 Lining Project will be put out for competitive bid for construction of the project. HPID will complete a small portion of the proposed work as an in-kind contribution to the project. HPID crews will build the access roads and access ramps into each end of the tunnel for the contractor to access. Road building and surfacing are tasks District personnel are well versed in and fully capable of handling to help reduce the project cost. HPID has the following array of equipment which will be used during their construction.

- Excavator
- Backhoe
- Grader
- Loader
- Dump Trucks
- Survey Equipment
- Equipment Transport
- Soil Compactor

The District's installation crew is well versed in the operation of all equipment listed above and has sufficient experience to ensure proper execution of their portion of the project.

3.0.2 Design Criteria

The Tunnel 2 Lining Project has not been fully designed at this point. A preliminary design has been completed to ensure proper hydraulics and flow regime through the tunnel. However, further design will be required to determine exact dimensions of the liner structure. The estimated construction quantities are presented in Table 1 as developed from the preliminary design. All design criteria will meet and/or exceed USBR standards for construction. Full construction specifications will be used for the construction package for guidance for the contractor.

HPID has advertised and contracted a professional engineer to assist the District with the Project. The firm selected was Performance Engineering and Consulting, PLLC (PEC) based on their qualifications and the selection criteria and process required under the State of Montana Procurement Procedures. PEC will work with the USBR and the District as needed to provide support in the completion of the project. Table 1 shows the preliminary list of the major components necessary for the project. The components in Table 1 were also used as the basis for the cost estimate for the Tunnel 2 Lining Project.

Table 1. Preliminary Tunnel 2 Construction Quantities

Item	Quantity	Units
Mobilization/Demobilization	1	LS
Taxes/Insurance/Bonds	1	LS
BNSF Permitting & Coord.	1	LS
Dewatering	1	LS
Selective Demolition	1	LS
Concrete Floor Prep & Patch	25,000	SF
Concrete Stem Wall	1,200	CY
Multi-Plate Structural Arch	1,660	LF
Interior Cutoff Walls	20	CY
Flowable Fill (Void Space)	1,180	CY
Concrete Headwall Transition	10	CY
Concrete Outlet Transition	10	CY
3” Gravel Surface	175	CY
12” Road Base	700	CY

3.0.3 Construction

As previously noted, HPID will put the project out for competitive bid as required by State of Montana Procurement Procedure. HPID will construct the access roads and ramps into and out of the Main Canal for use by the contractor. All material procurement and construction will be the responsibility of the selected contractor. HPID will contract PEC to provide construction oversight and inspection through the project to ensure that the District and USBR’s goals and requirements are being met.

3.1 Water Conservation

3.1.1 Quantifiable Water Savings

The HPID has a water right for a total diversion of up to 750 cfs from the Yellowstone River. The District worked with USBR field staff and used standard stream flow measurement devices to take readings at upstream and downstream points in the Main Canal. At each point a control section was established and the velocity meter was calibrated to read the flow through the control sections. During the flow measurement all

system outflows were closed to gain an accurate measurement in the system. **Losses, as measured by the District, account for up to 70 cfs, which includes seepage, evapotranspiration, and conveyance losses.** Using the data from flow measurements PEC conducted a hydraulic analysis of the flows and losses in an effort to quantify the losses directly attributable to Tunnel 2. ***Using soils information and available hydraulic data it was determined that 3 cfs is lost to seepage within Tunnel 2, which equates to 1,037 acre-feet of water lost annually.*** Additionally, PEC analyzed the hydraulic impact the deterioration of Tunnel 2 has on the upstream section of the Main Canal. Using hydraulic modeling it was determined that installation of the proposed improvements will drop the operating level of the canal by up to 3 feet from improvement to the flow characteristics of the tunnel. Using this reduction in head along with flow values and soils data it was calculated that a reduction in seepage of up to 16.5 cfs could be achieved, which equates to 5,521 acre-feet annually conserved. ***The total water conservation contributable to the Tunnel 2 Lining Project is measured/calculated to be 19.5 cfs or 6,558 acre-feet annually.*** Losses account for anywhere from 10-25% of the canal capacity depending on the time of year. Water loss analyses conducted by PEC are provided in Appendix B for reference. These losses contribute to the continued inefficiencies at the on-farm application level as well.

Through the implementation of the Tunnel 2 Lining Project it is anticipated that all seepage losses within the canal will be eliminated and seepage upstream will be reduced. Exhibit E-2 shows the proposed configuration and likely typical section as planned for Project. Minor losses in conveyance will likely remain but those are anticipated to be nearly unnoticeable due to the size of the tunnel and grades in the area. HPID has documented substantial conveyance losses upstream of the project area as well as delivery efficiency concerns downstream of the project area. HPID documents operational spills through the head of the system contributed to the Tunnel 2 area losses and corresponding canal level fluctuations. Systematic spills at the head of the system are required to regulate the Main Canal due to losses. These spills will also be measured to document water conservation in the delivery system. Ditch riders document daily canal levels and diversion operations so the HPID can annually report its water consumption. The Tunnel 2 Lining Project will

include the installation of field staff gauges calibrated to document flows upstream and downstream of Tunnel 2 to continue the documentation and report all savings. By comparing prior years of operational records and flow measurement data the HPID will be able to report all water conservation to the USBR upon completion of the project and throughout its operational life.

3.1.2 Percentage of Total Supply

The overall water supply for the HPID is approximately 750 cfs. The measured/calculated losses contributed to the Tunnel 2 Project account for up to 19.5 cfs which is diverted from the Yellowstone River and lost. **This translates to a conservation of up to 3% of the overall water supply historically used by HPID.**

3.2 Energy-Water Nexus

3.2.1 Implementing Renewable Energy Projects

This project will not implement or include any renewable energy features.

3.2.2 Increasing Energy Efficiency in Water Management

The Tunnel 2 Lining Project will improve management of the delivery system which will require less operational oversight. That improvement will lead to less travel by District staff managing water levels in the system. Currently operational staff are required to travel to the head of the system up to eight times per day to maintain water levels in the system due to conveyance inefficiencies and seepage losses in the project area. Through the implementation of the lining project improvements, the District Manager estimates that those trips will likely be reduced to four times per day, a 50% reduction in travel time and emissions. From the District office to the Diversion Dam to regulate canal flows is a distance of approximately 12.5 miles one way or 25 miles roundtrip. ***This project will result in the reduction in travel of up to 100 miles per day during the irrigation season or 16,800 miles annually.*** Using EPA developed emission rates for a standard light-duty pickup 513.5 grams of CO^2 are emitted every mile. ***Using these number the Tunnel 2 Lining Project will result in a reduction of up to 19,000 pounds of CO^2 emitted annually by District travel.*** Calculations and supporting information can be found in Appendix C.

3.3 Benefits to Endangered Species

The proposed Tunnel 2 Lining Project will immediately reduce water withdrawn from the Yellowstone River by up to 6,558 acre-feet annually; eliminate 19,000 pounds of CO^2 from being discharged into the atmosphere; and improve water quality in the Yellowstone River by reducing irrigation return flows.

Wildlife within and around the HPID is plentiful and includes many species of common birds, animals, and fish. Within the HPID operating area there are three species listed on the US Fish and Wildlife Services Endangered Species List, the Pallid Sturgeon, Whooping Crane, and Black-footed Ferret. There are two species listed as species threatened or candidate species and 25 migratory birds listed as threatened, list, or candidate species.

In recent years there have been major investments irrigation infrastructure along the Yellowstone River to improve habitat for the Pallid Sturgeon. Downstream of the HPID Diversion Dam a number of irrigation districts have worked to implement systems to improve the flows in the Yellowstone River and its flows. Chief among them is the Lower Yellowstone Irrigation Project's Intake Diversion which the USBR, US Fish and Wildlife, USCOE, MT DNRC, and local irrigation district have invested tens of millions of dollars to modify to allow for improved spawning of the Pallid Sturgeon. The Pallid Sturgeon will directly and immediately benefit from the propose project through the reduction in water withdrawn from the Yellowstone River improving instream flows. Additionally, immediate direct benefits from reduced intake of river water include less impingement of fish on intakes and reduced entrainment in unscreened pumps and diversions. The US Fish and Wildlife Service's Pallid Sturgeon Recovery Plan can be found at: http://www.fws.gov/yellowstonerivercoordinator/pallid%20recovery%20plan.pdf.

The Tunnel 2 Lining Project will result in an improvement of instream flows in the Yellowstone River. Increased instream flows will provide improve fisheries habitat for not just the Pallid Sturgeon but the all fish listed as species at risk downstream of the HPID system. It is important to look at the benefits provided by the Tunnel 2 Lining Project in

the context of long term conservation of both water and the environment. Investments in the improvement of instream flows for the Pallid Sturgeon are marginal in comparison to the major infrastructure investments in diversions, fish ladders, and screening. This project will have a notable long term positive impact on the Pallid Sturgeon and Sturgeon habitat in the Yellowstone River for decades to come.

3.4 Water Marketing

This project will not directly create or participate in water marketing. However, 6,558 acre-feet of conserved water will improve instream flows in the Yellowstone River flowing into the Missouri River flowing into the Mississippi River will provide the opportunity for downstream users to benefit in water marketing potential of the conserved volume. HPID's goal is to optimize diverted water use so as to maximize its beneficial use of the Yellowstone River.

3.5 Other Contributions to Water Supply Sustainability

3.5.1 WaterSMART Basin Study Adaption Strategies

A WaterSMART Basin Study has not been completed for the Yellowstone River in the area HPID is located. Therefore there is no applicability of this subcriterion.

3.5.2 Expediting Future On-Farm Irrigation Improvements

The Tunnel 2 Lining Project is not located directly adjacent to irrigated acres within the HPID. Being located at the head of the system the facility does however directly impact all water users and the volume of water available for irrigators through the season. The Tunnel 2 deficiencies described in previous sections have led to the District's struggles to supply adequate water to both the Highline Canal and the east end of the District. Water losses at the head of the system and the required spills to regulate Main Canal levels have left fields without adequate water supply at the end of the system. These fields currently irrigate through traditional flood methods using ditches or siphon tubes which struggle to function reliably with fluctuating water levels. Local Irrigators have indicated interest in upgrading on-farm irrigation methods if reliable water supply/delivery was secured by the District.

The local NRCS has been active in the HPID working with irrigators in regions which have adequate water supply and head to implement on-farm improvements such as gated pipe and sprinkler irrigation. NRCS has engaged in past projects and is actively working with irrigators downstream of the Tunnel 2 area to modify traditional flood irrigation (siphon tubes and ditch flood).

Currently on-farm improvement projects don't make technical sense due to the lack of water delivery and water pressure at the field headgates. Without sufficient head provided to pivots or gated pipe at the field turnouts additional pumps or boosters to push water through the respective systems. Open canal delivery systems cannot provide sufficient hydraulic pressure to meet those requirements. This leads to increased operational costs as well as additional energy consumption when it is not necessary. The HPID is currently primarily irrigated through flood irrigation methods. An NRCS field study was completed in a neighboring irrigation district located along the Yellowstone River measuring field flood irrigation methods and efficiency. When combined with an open canal delivery system, field application efficiencies averaged approximately 27% for traditional flood methods. This low application efficiency measured by the NRCS revealed that 73% of the water applied to the field was either runoff or oversaturation at the head of the field ditch. The majority of the waste water was excess spill at the end of the field from the flood irrigation methods. The NRCS also compared flood irrigation efficiency when combined with a pressurized conduit. They found that when combined with pressure head from a pipeline flood irrigation methods increased in efficiency up to 65%. Models run on fields and soil types located within the HPID area showed that with a 27% application efficiency a gross application of 48-inches of water per acre is required, while at a 65% application efficiency a gross application of 20-inches per acre is required. Through the implementation of a delivery system improvements irrigators can better apply water to their fields and substantially reduce topsoil erosion and chemical runoff into the drains and waterways.

Because the Tunnel 2 Project is not located directly adjacent to irrigated operations it is hard to directly contribute its implementation to triggered on-farm improvements.

However, it is well-known that implementation of the improvements will result in improved delivery efficiency and water availability downstream in the system. Once irrigators realize the full impact of the water conservation measures it will likely trigger on-farm improvements in the Highline Canal area and on the water-short east end of the District.

3.5.3 Building Drought Resiliency

The Tunnel 2 Lining Project is located at the lower end of the Yellowstone River Basin which flows into the Missouri River Basin. In the past decade the Yellowstone River has not experienced severe or extended drought. The Yellowstone River is undammed and remains “wild” in nature with no storage along its route. In-stream flows however are important to the downstream Missouri River Basin and further in the Mississippi River Basin. In-stream flows are critical to downstream water users and water levels in the remaining downstream reservoirs on the Missouri River.

Water saved by the project will help preserve flow regimes in the Yellowstone and Missouri Rivers. The multitude of downstream water users and aquatic habitat and wildlife benefit from in-stream flow preservation during droughts. This project will ensure that 6,558 acre-feet of water annually remains in the Yellowstone and Missouri River Basins during periods of drought for the benefit of downstream users.

3.5.4 Other Water Supply Sustainability Benefits

HPID actively participates and partners with local and regional agricultural groups to better conserve water in the District. The Tunnel 2 Project has drawn large support from local, regional, and state agencies as well as businesses working in the area. A portion of the project will be invested in by local agricultural groups due to its contributions to water conservation and irrigated agriculture efficiency improvements. HPID has had conversations with State of Montana DNRC regarding funding opportunities and investment from the State in the project. This project does not line up well from a funding cycle standpoint with the State’s typical funding cycles. The District is continuing discussion with the State to determine whether loan funding through the DNRC is the best route for the project. Indications for the DNRC are that the Tunnel 2 Project would be of interest and qualify for state loan funding to complete the project. Those conversations

continue to be on-going and will be completely flushed out prior to WaterSMART funding award. Letters of support from local banks, conservation districts, economic development groups, ag-based businesses, and local agricultural extension offices have been received and can be made available upon request.

The proposed improvements will help the District address increased water demands within the system amongst irrigators by improving delivery efficiency and reducing losses at the head of the system. As previously noted, the Highline Canal and east end of the District continue to struggle with water supply. By improving water management within the system and not only reducing seepage losses but creating a steady flow from the head of the system, periodic spills can be reduced while managing water levels. Those reductions will directly impact and benefit those in water short areas of the District.

The proposed improvements will not directly benefit water availability for an Indian tribe in the area. However, the project will impact water availability for rural and disadvantaged communities such as Huntley, Worden, and Ballantine. Agricultural production is the sole and primary driver to these small rural communities which have little other economic engines which aren't directly linked to agriculture. The communities of Huntley, Worden, and Ballantine according to the US Census Bureau and Montana Department of Commerce consist of 53%, 45%, and 79% low to moderate income levels, respectively. This is a primary indicator of the importance of water availability and sustainability of irrigated agriculture to this area which the Tunnel 2 Project will help provide.

3.6 Implementation and Results

3.6.1 Project Planning

Water conservation plans for HPID system include monitoring and surveys compiled by the USBR, DNRC, PEC and the District. An investigation of the District's three tunnels was completed by PEC on behalf of the District in October, 2015. Additionally, HPID compiled a Water Conservation Plan to help guide the District in future decisions and management of the resources. These plans have helped guide the District in the way of water conservation in recent years. The most recent investigation and study completed

by PEC on the existing tunnel systems indicated the severity of the water losses in Tunnel 2. The condition assessment and water losses at the head of the system were presented to the HPID board during a number of open public meetings. During these meetings the public was given a chance to comment on the project. The Board decided after evaluating the information presented on Tunnel 2, its water losses and inefficiencies, to proceed forward with implementation of a solution to the problems. The Tunnel 2 Project has been on the HPID's priority list but has now been moved to the forefront for rehabilitation. Appendix A contains photos taken from PEC's investigation.

Recognizing the need to create a unified approach to economic development the Eastern Plains Resource Conservation and Development Council (RC&D), comprised of the 16 eastern counties in Montana prepared an Area Plan. The Area Plan is the result of a local planning and implementation process designed to create jobs, foster a more stable and diversified economy, improve living conditions, and provide mechanisms for guiding and coordinating the efforts of organizations concerned with all aspects of natural resources and economic development. The natural resources of the area, including the Yellowstone River, have been the sustaining feature of the economy through the last century supporting agriculture, oil and gas, coal and tourism. Through public scoping and interaction with groups and individuals in the 16 county region several issues were identified which could provide long term, sustainable natural resource benefits for the region. Consistent with these identified opportunities the RC&D set Goal B "A coordinated effort of the RC&D Area's residents and governmental units is utilized to…..develop water delivery and irrigation potential; and to improve the overall efficiency of irrigation water use by 2015, as the Area's water is essential to residents' economic livelihood and quality of life." The RC&D and recognizing the correlation between the irrigated agriculture, Yellowstone River, and other area agencies and businesses it shows the efforts that have been taken to coordinate water conservation and energy.

3.6.2 Readiness to Proceed

The Tunnel 2 Lining Project will be ready for construction upon completion of the 2016 irrigation season. The District will have secured loan funding from the either the Montana

DNRC, USBR, or local lending institution by August of 2016. Preliminary engineering and planning for the project have been completed. The project does not include or require any easement or right-of-way acquisition as the lining system will be installed in the existing canal right-of-way. The HPID has worked to make sure that the project is shovel ready upon completion of the funding package.

The successful implementation of Tunnel 2 Lining Project will include the following major tasks:

- **Task 1 – Loan and USBR Grant Awards.** It is anticipated that the grant awards will be released in June 2016.
- **Task 2 – Tunnel 2 Lining Design.** HPID will contract with a licensed professional engineer to develop the tunnel lining system design, conduct inspections, and provide construction administration, as necessary. This task will be completed by October 2016.
- **Task 3 – Regulatory Compliance.** The Engineer will obtain the required permits and ensure that the project meets all regulatory requirements. This task will run concurrently with Task 2.
- **Task 4 – Project Review.** The Engineer will submit the tunnel lining system design and specifications for review by the HPID and the USBR. All comments and concerns will be addressed and the plans and specifications will be finalized. This task will be completed by October 2016.
- **Task 5 – Contractor Procurement.** The HPID will put the project out for public bid by advertising the project on state contractor project exchange boards and local papers. The District will select a contractor for the project based on qualifications and competitive bid. The lowest responsive bidder will be contracted by the District to complete the project. This task will be completed in October-November 2016.
- **Task 6 – Tunnel 2 Lining Construction.** The HPID and PEC will oversee the contractor completing inspections and construction documentation throughout the project. The contractor will complete the construction and installation of the Tunnel 2 Lining System. It is estimated that construction will take two irrigation off seasons to install. This task will be completed from November 2016-April 2017 when it will

be shut down for the 2017 irrigation season and then final completion will be done October-December 2017.

- **Task 7 – Construction Closeout.** HPID, in coordination with the Engineer, will work to assure that all issues with installation have been addressed. The Engineer will also develop a set of as-built plans to document any changes in the field. This task will be completed by May 2018.
- **Task 8 – Funding Closeout.** HPID will work with the Engineer to assure that proper documentation including invoices, reports, etc. have been submitted and the grant will be closed. This task will be completed by June 2018.
- **Task 9 – Project Completion.** The estimated project completion is June 2018 with construction having been completed prior to the 2018 irrigation season.

Coordination of the project will take place between all local, state, and federal agencies involved. The majority of project coordination will occur between the HPID, DNRC, BOR, and the contracted engineering firm. Project Manager Todd Wilson will be responsible for facilitation of communication and cooperation between the agencies and organizations involved in the project.

The project will include quarterly progress reports to be submitted by the HPID to the USBR during design and monthly progress reports during construction by the contracted engineering firm. The progress reports will keep the various agencies and organizations up-to-date on the project progress, schedule, and budget. Should any changes or problems arise during the design or construction phases of the project, all involved parties will be notified immediately. The construction phase of the project will include monthly updates to the HPID from the Project Manager and contracted construction inspector on progress made. The HPID Project Manager and grant coordinator will be responsible for the completion and submittal of all necessary documentation and billing to the USBR and HPID board. The contracted engineer's responsibilities include progress reporting and assistance with grant reporting. HPID Project Manager Todd Wilson will be the final authority on all payments, reports, and contracts for the project.

3.6.3 Performance Measures

The HPID has implemented water measurements in its operational protocols throughout the District. As part of the project flow measurement staff gauges will be installed on the inlet and outlet structure of Tunnel 2 to monitor water loss through the system. Additionally, the District will monitor and record corresponding spills associated with maintaining water levels in the Main Canal at the head of the system. These spills can be measured under the same methods and recorded for HPID and USBR documentation. These documentations strategies will assist the District and USBR in ensuring that the proposed water conservation is documented and properly accounted for. Those records will be kept by District staff and compiled be the District Manager.

3.6.4 Reasonableness of Costs

The HPID crew and District Manager have completed numerous construction projects within the past ten years. These project have varied from canal construction to pipeline installation to major concrete structure construction. The experience of the District in construction was used to develop the in-kind budget for the work to be completed by the District. Construction costs for the remaining portion of the project were developed through numerous conversations with local and regional material suppliers, regional contractors, and bid tabs for projects similar in nature. PEC worked with all parties to ensure that the proposed budget was created in a conservative manner for the District and USBR. The overall budget for the Tunnel 2 Lining Project is $3,773,739.72. The HPID has committed to encumbering debt through a loan to commit $2,773,739.72 for completion of Tunnel 2 Lining Project. That leaves $1,000,000.00 being applied for through this WaterSMART application.

Engineering costs were included in the Construction Cost Estimate to cover both final design and construction inspection. As previously noted, the HPID has advertised for general irrigation engineering services and selected PEC through a qualifications based selection process which meets all state and federal procurement requirements. All procurement information can be available upon request. The Engineering Budget was developed using an agreed upon rate schedule between the District and PEC in which all

direct and indirect costs as well as profit are built into the hourly rates.

As previously outlined the Tunnel 2 Lining Project will conserve up to 6,558 acre-feet of water annually. It is generally accepted that concrete installed in low-head/low-pressure systems has a design life of 50 years conservatively. Similarly, steel multi-plate systems have been used across the Rocky Mountain Region and within Montana under low-head systems. The design life for multi-plate systems according to the manufacturer and private studies indicate conservatively 50 years can be expected from the system. With a 50 year design life for PIP irrigation pipe and valves the cost of per acre-foot of water conserved through the project over its life is roughly $11.50. This is a marginal cost for water conservation and improved in-stream flows in the Yellowstone River and the benefits it provides.

3.7 Additional Non-Federal Funding

The HPID has committed to encumber $2,773,739.72 of that budget for completion of the Tunnel 2 Lining Project. That leaves $1,000,000.00 being applied for through this WaterSMART application. The overall construction cost for the Tunnel 2 Lining Project is $3,773,739.72. The non-federal percentage of funding for the project is 73.5% which exceeds the 50% WaterSMART requirement. Table 2 outlines the funding dollars, sources, and commitment at the time of this application.

Table 2. Financial Sources & Commitment

Source	Proposed Funding Amount	Funding Commitment
Huntley Project Irrigation District (Loan)	$2,773,739.72	Committed
US Bureau of Reclamation	$1,000,000.00	Pending

3.8 Connection to Reclamation Project Activities

HPID is a UBSR irrigation project, built by the USBR with the operation and maintenance of the facility contracted to HPID. USBR owns the Yellowstone River Diversion Dam and delivery infrastructure, including Tunnel 2, however since 1927 HPID has been contracted to run and operate the District. The water right for the HPID is held in joint with the USBR, making all diverted water used for irrigation in part water of the United States. The HPID

project is one of four USBR irrigation districts located on the Yellowstone River. Buffalo Rapids Districts 1 and 2 as well as the Lower Yellowstone Irrigation District are all located downstream of the HPID. Improved instream flows could benefit the USBR facilities located downstream of the HPID, with a focus on the Lower Yellowstone facilities and current Endangered Species Act issues revolving around the Pallid Sturgeon. HPID is directly tied to the UBSR in all its operations and has developed an excellent working relationship with the USBR and continues to build upon that. The District is motivated to continue implementing water conservation measures to benefit not only the HPID irrigators but downstream users including the USBR in the future.

4.0 PERFORMANCE MEASURES

4.1 Quantifiable Water Saving

The HPID, in coordination with USBR field staff, conducted a series of water measurements within the Main Canal in the Tunnel 2 area during the planning process for the project. As previously noted, these measurements showed substantial seepage losses throughout the Main Canal-Tunnel 2 area. The proposed improvements will address seepage/conveyance losses which were measured and calculated to total 19.5 cfs. Using the typical irrigation season for the HPID the overall water savings from the Tunnel 2 Lining Project amounts to 6,558 ac-ft per year. These records are provided in the Appendix B.

Upon completion of the Tunnel 2 Lining Project flow measurement staff gauges will be installed upstream and downstream of Tunnel 2 for monitoring and recording flows in the facility. Additionally, the District will work with USBR field staff to continue to measure and monitor flows and losses in the Tunnel 2 area annually. HPID staff will record the data and report the results back to the District board and USBR.

C:\Users\aallinson\Dropbox (PEC Billings)\PEC Billings Team Folder\Huntley Project Irrigation District\2015-046 HPID Main Canal Tunnel Inspection\CAD\DWG\Exhibit \Tunnel Overview.dwg 12/4/2015 4:28 PM COLOR TBL: PEC Standard.ctb

PROJECT TITLE

TUNNEL NO. 2
REHABILITATION

SITE LOCATION

DSGN	DATE	DATE	CHKD
ANA	DESIGN DATE		SAA
REV	DATE		CHKD

2015-046

CLIENT

HUNTLEY PROJECT
IRRIGATION DISTRICT

2291 2ND ST. W
BALLANTINE, MT 59006

PEC
PERFORMANCE ENGINEERING & CONSULTING
2101 OVERLAND AVE
BILLINGS, MT 59102
(406) 461-8392

EXHIBIT
E-1

PROJECT TITLE

TUNNEL NO. 2
REHABILITATION

EXISTING X-SECTION

DSGN	DATE	CHKD
ANA	DEC-15	SAA

REV	DATE	CHKD

2015-046

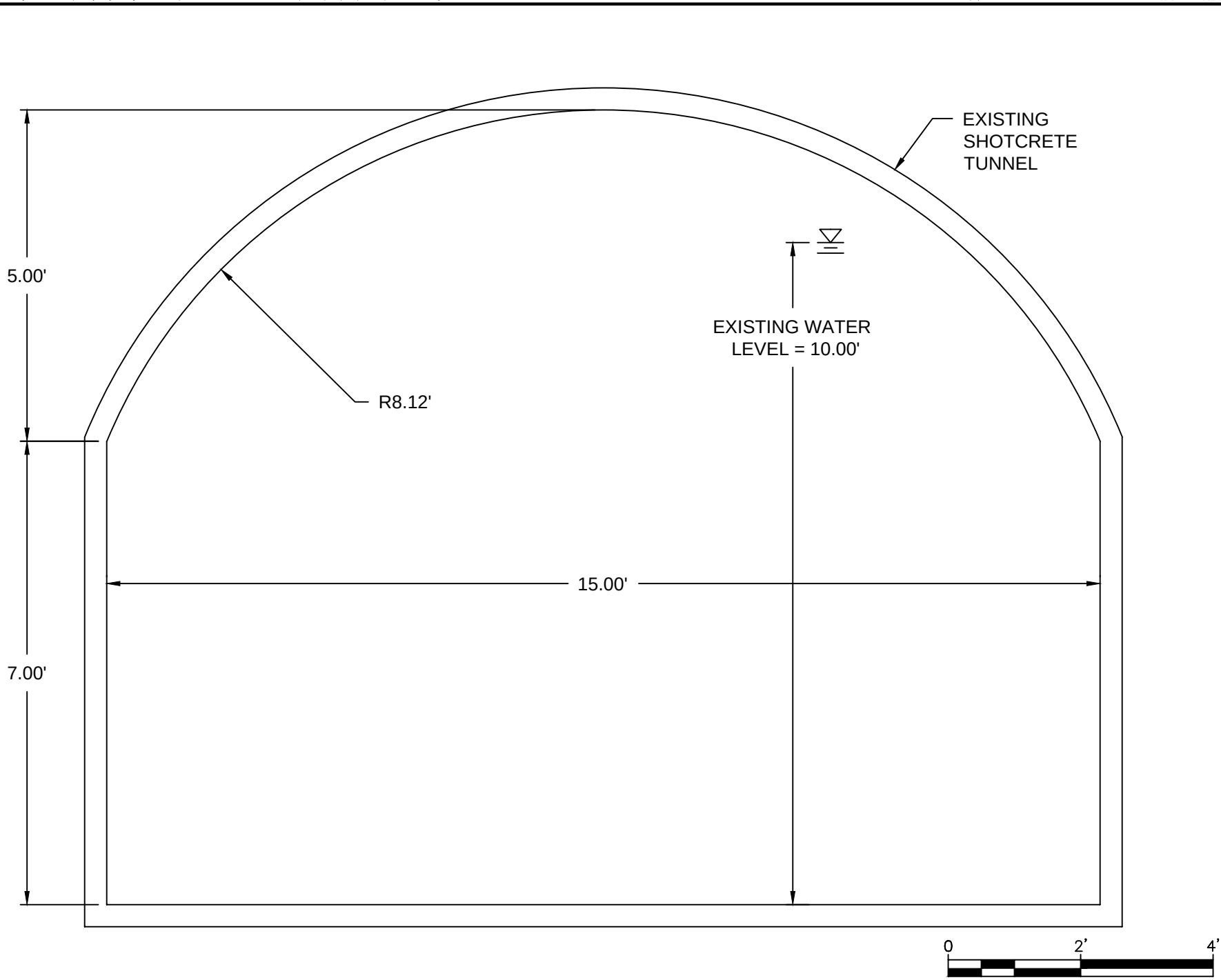
CLIENT

HUNTLEY PROJECT
IRRIGATION DISTRICT

2291 2ND ST. W
BALLANTINE, MT 59006

PERFORMANCE ENGINEERING & CONSULTING
2101 OVERLAND AVE
BILLINGS, MT 59102
(406) 461-8392

EXHIBIT
E2.1



PROJECT TITLE

TUNNEL NO. 2
REHABILITATION

PROPOSED X-SECTION

	DSGN	DATE	CHKD
REV	ANA	DEC-15	SAA
DATE	DATE	CHKD	

2015-046

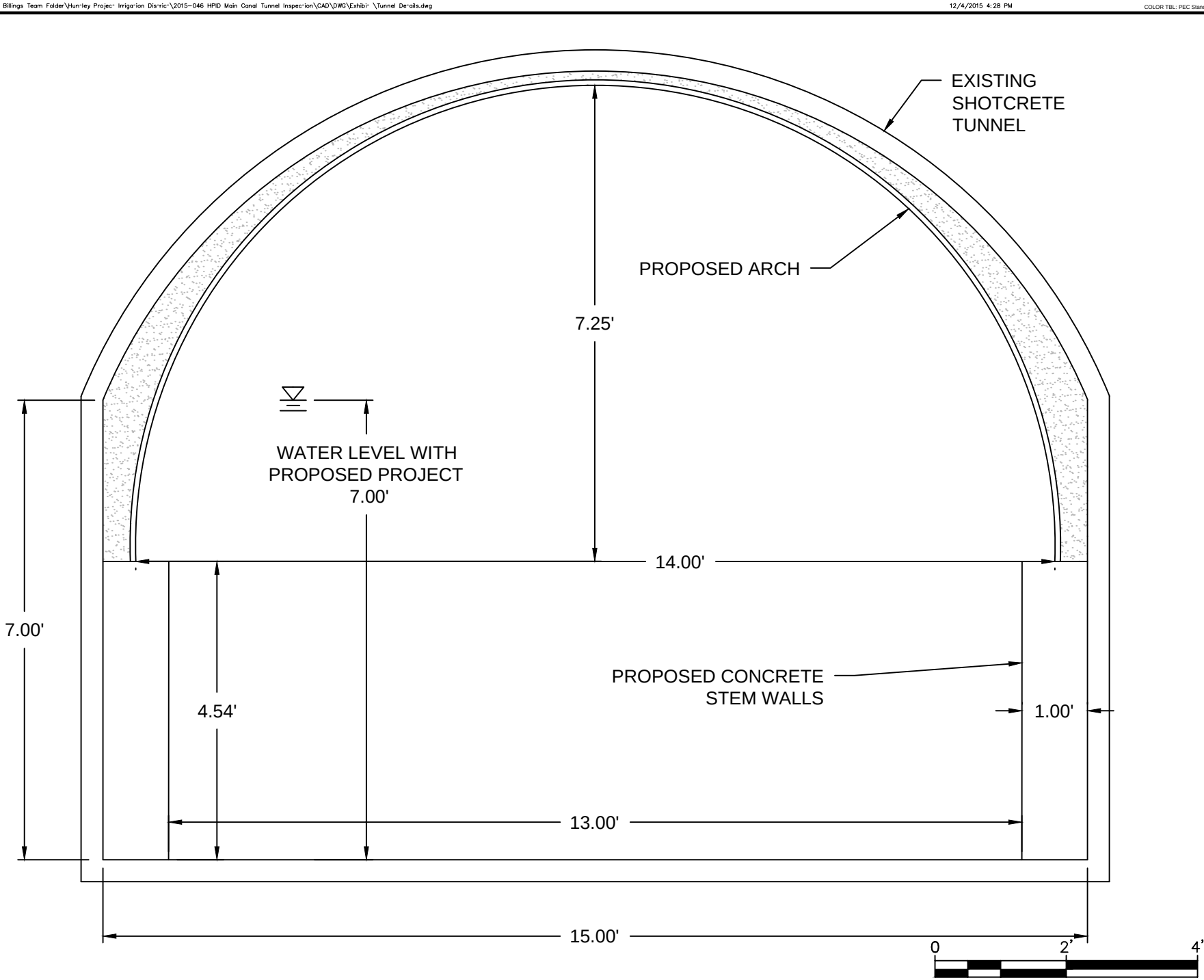
CLIENT

HUNTLEY PROJECT
IRRIGATION DISTRICT

2291 2ND ST. W
BALLANTINE, MT 59006

PERFORMANCE ENGINEERING & CONSULTING
2101 OVERLAND AVE
BILLINGS, MT 59102
(406) 461-8392

EXHIBIT
E2.2



PROJECT TITLE

TUNNEL NO. 2
REHABILITATION

DISTURBED AREAS

DSGN	DATE	CHKD
ANA	DSGN DATE	SAA
REV	DATE	CHKD
2015-046		

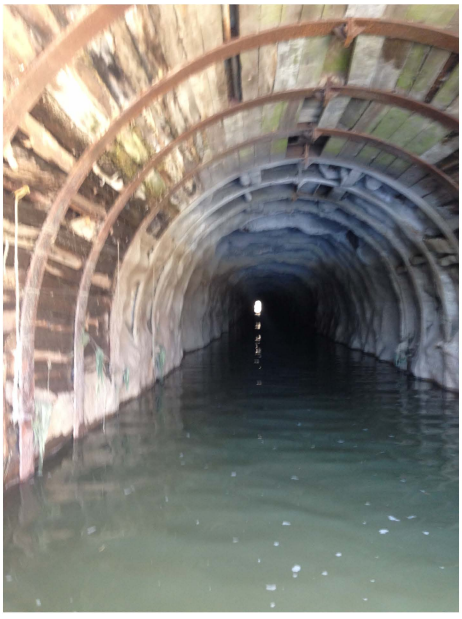
CLIENT

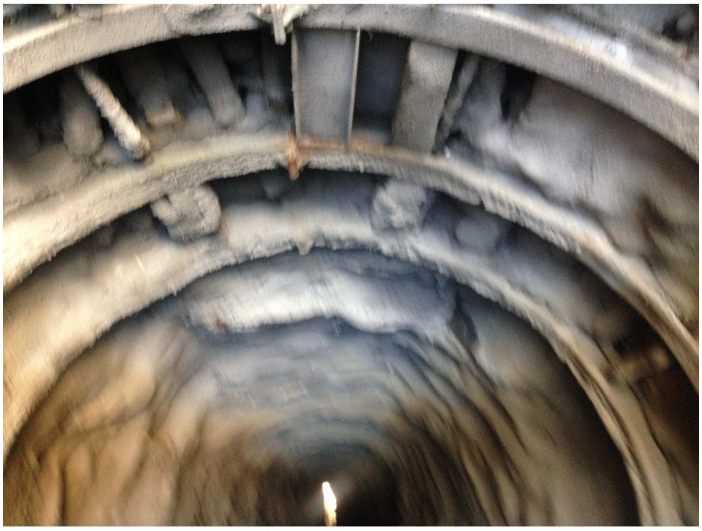
HUNTLEY PROJECT
IRRIGATION DISTRICT

2291 2ND ST. W
BALLANTINE, MT 59006

PERFORMANCE ENGINEERING & CONSULTING
2101 OVERLAND AVE
BILLINGS, MT 59102
(406) 461-8392

EXHIBIT
E-3





PERFORMANCE
ENGINEERING & CONSULTING

Project No: 15-046
Date: 1/15/2016
Peformed By: ANA

Water Seepage Losses Between Tunnels 1 & 2

Irrigation District	Soil Type	K_{sat} (µm/sec)	K_{sat} (ft/day)	% of L	L (ft)	K_{ave} (ft/day)	A_{wet} (sf/lf)	Q_{seep} (cfd)	Q_{seep} (cfs)	Days in Operation	Q_{Total} cfs	Q_{Total} Acre Feet
HPID												
Existing					3,516	35.67	55.74	6,990,060	**80.90**	168	**80.90**	**27,184**
	Al	129.71	36.77	92%								
	Ll	81.42	23.08	8%								
Proposed					3,516	35.67	44.42	5,570,276	**64.47**	168	**64.47**	**21,662**
	Al	129.71	36.77	92%								
	Ll	81.42	23.08	8%								
									Difference in Seepage		**16.43**	**5,521**

PERFORMANCE
ENGINEERING & CONSULTING

Project No.: 2015-046
Date: 1/19/2016
Performed By: ANA

Emission Reduction for HPID

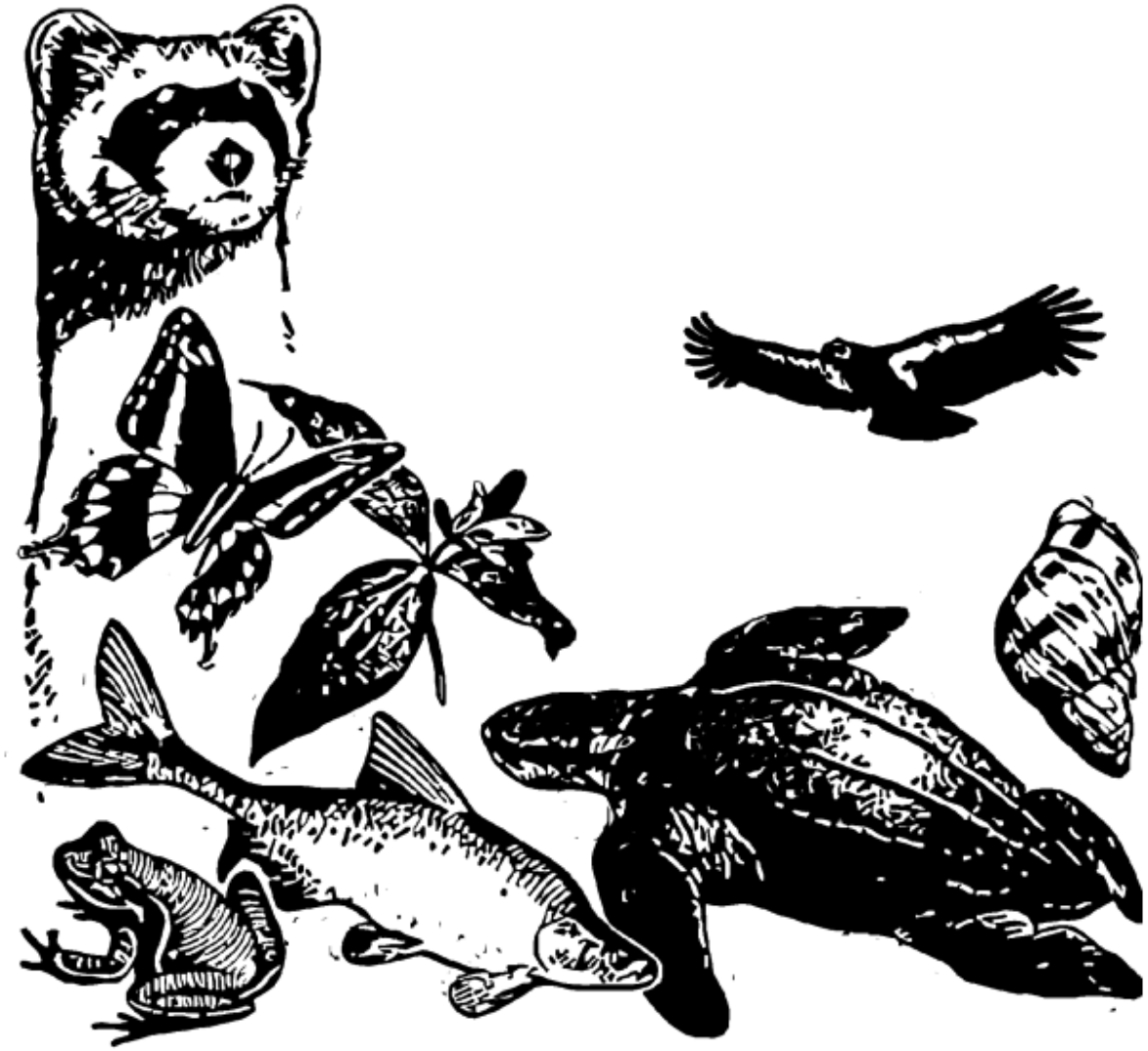
Description	Value	Units
Reduction in travel	100	miles/day
Annual Reduction in Travel	16,800	miles/year
EPA emission rate for a standard light-duty pickup	513.5	grams of CO^2/mile
Calculated weight of annual CO^2 emissions	8,626,800	grams of CO^2/year
	19,002	**lbs. of CO^2/year**

HPID Tunnel 2 Lining Project

IPaC Trust Resource Report

Generated January 17, 2016 11:52 AM MST, IPaC v2.3.2

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

US Fish & Wildlife Service

IPaC Trust Resource Report

NAME

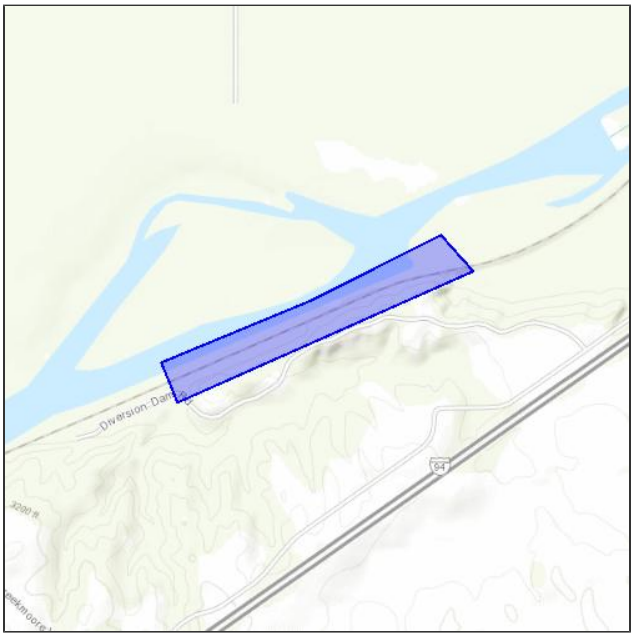
HPID Tunnel 2 Lining Project

LOCATION

Yellowstone County, Montana

IPAC LINK

https://ecos.fws.gov/ipac/project/M7SOL-CM26J-EVFN2-KQIGM-EH2ZKQ



U.S. Fish & Wildlife Contact Information

Trust resources in this location are managed by:

Montana Ecological Services Field Office
585 Shepard Way, Suite 1
Helena, MT 59601-6287
(406) 449-5225

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require FWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list from the Regulatory Documents section in IPaC.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

Red Knot Calidris canutus rufa — Threatened

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DM

Sprague's Pipit Anthus spragueii — Candidate

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0GD

Whooping Crane Grus americana — Endangered

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B003

Mammals

Black-footed Ferret Mustela nigripes — Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A004

Black-footed Ferret Mustela nigripes — Experimental Population, Non-Essential

CRITICAL HABITAT

No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A004

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/akn-histogram-tools.php

The following species of migratory birds could potentially be affected by activities in this location:

American Bittern Botaurus lentiginosus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F3

Baird's Sparrow Ammodramus bairdii — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B09B

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Brewer's Sparrow Spizella breweri — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HA

Burrowing Owl Athene cunicularia — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0NC

Cassin's Finch Carpodacus cassinii — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0J6

Ferruginous Hawk Buteo regalis — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06X

Golden Eagle Aquila chrysaetos — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0DV

Grasshopper Sparrow Ammodramus savannarum — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0G0

Greater Sage-grouse Centrocercus urophasianus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06W

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S

Mccown's Longspur Calcarius mccownii — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HB

Mountain Plover Charadrius montanus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B078

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Pinyon Jay Gymnorhinus cyanocephalus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0I0

Prairie Falcon Falco mexicanus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0ER

Red-headed Woodpecker Melanerpes erythrocephalus — Bird of conservation concern
Season: Breeding

Rufous Hummingbird selasphorus rufus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0E1

Sage Thrasher Oreoscoptes montanus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0ID

Short-eared Owl Asio flammeus — Bird of conservation concern

Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Sprague's Pipit Anthus spragueii — Bird of conservation concern

Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0GD

Swainson's Hawk Buteo swainsoni — Bird of conservation concern

Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B070

Upland Sandpiper Bartramia longicauda — Bird of conservation concern

Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HC

Western Grebe aechmophorus occidentalis — Bird of conservation concern

Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EA

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuges in this location

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

Freshwater Emergent Wetland

PEMA 3.42 acres

Freshwater Forested/shrub Wetland

PSSA 0.362 acre

Freshwater Pond

PABFx 6.13 acres

Riverine

R2UBH 25800.0 acres

R2USA 4.71 acres

A full description for each wetland code can be found at the National Wetlands Inventory website: http://107.20.228.18/decoders/wetlands.aspx

Huntley Project Irrigation District Environmental Compliance

Tunnel 2 Lining Project

The Tunnel 2 Lining Project improvements will reduce water withdrawn from the Yellowstone River by up to 6,558 acre-feet annually; have a positive impact on the water quality in the Yellowstone River; and reduce the CO^2 emissions within the HPID by nearly 19,000 pounds annually.

Environmental Resources Present & Detailed Effects

Installation of the Tunnel 2 improvements will include ground disturbances which are generally maintained to a 30-foot wide disturbance corridor. The main canal will be accessed by existing access roads or two-track access roads which will be improved to support the construction activities. Outside of materials and equipment staging, all construction activity will be done within the existing canal and canal right-of-way which serves as active irrigation infrastructure. Any material or debris removed from the site will be disposed of either in a permitted landfill or within the District's storage yard. The majority of the area has been previously disturbed and is actively used for irrigation activities. Dust could become a concern at different points through construction, however the area is typically damp due to irrigation practices. Should dust become of concern the HPID will take measures to ensure dust abatement such as water applications in the area. Construction staging areas will be reclaimed to their previous condition upon completion of the project. This should help to minimize the impacts on wildlife and safety in the area. Construction noise will be present but only temporary in nature. Construction activities will take place within the interior of the District in places well away from the public or local residences in the area.

Wildlife is present within the boundaries of the HPID but little activity is present in the Tunnel 2 area due to BNSF traffic and rugged terrain. Within the general area there are two species listed as Endangered by the US Fish and Wildlife Service, the Black-footed Ferret and the Whooping Crane. There are two species listed as species at risk due to limited to extremely limited and/or potentially to rapid declining population numbers,

range, and/or habitat making them vulnerable to extinction. The two species listed as threatened or candidate are the Red Knot and Sprague's Pipit. There are 25 migratory birds listed within the project area, all included in the USFW Resource Report included in Appendix E of the Technical Report submitted with this application. Because the work associate with the Tunnel 2 Project is being conducted primarily within the tunnel itself and away from the river and riparian areas no focus will be placed on the invertebrates and fish. As previously noted, increases in instream flows and water conservation provided by the project will benefit both.

The Black-footed Ferret and Whooping Crane are both typically found in terrain outside of the Tunnel 2 project area. The project area is located directly adjacent to the BNSF main line and steep sandstone slopes. Access in and out is regularly used by the District to access the canal for maintenance and operation creating regular activity in the area. It is highly unlikely that either species occupy the specific project area or adjacent areas. Both species are likely to see marginal benefit as a result of reducing the amount of water withdrawn from the Yellowstone River. The most beneficial contribution of the project will be helping to ensure base flows in the Yellowstone River to allow the system to withstand the natural flow variations experienced from year to year. This project helps bring additional flows back to the river through the use of best management practices for water delivery.

Wetlands

An inventory of the wetlands within the project area was conducted by Performance Engineering & Consulting (PEC) staff in fall of 2015. There were no classified wetlands within the Tunnel 2 project area identified by staff during field investigations. Seepage from the Main Canal has created isolated areas which contain water through the irrigation season and dry out once the canal is shut down upstream of the project area which will not be disturbed. It is NRCS national policy, as stated in the NRCS General Manual, Part 190-410, that it is not required to mitigate for artificial wetlands created by seepage from leaking canal systems. The District intends to follow the referenced NRCS national guidance in design and construction of the Tunnel 2 Lining Project within the project corridor.

The proposed Tunnel 2 improvements may improve surface water quality and riparian areas both upstream and downstream of the project. By supplementing instream flows with up to 6,558 acre-feet of water annually through conservation general riparian habitat will see long term benefits downstream of the project. Furthermore, the project will increase operational efficiencies which will lead to less travel time from staff and up to a 19,000 pound reduction in CO^2 emissions discharged to the atmosphere annually. Additionally, installation of more efficient on-farm irrigation methods such as pivots which will result from completion of the project will also reduce sediment and chemical laden runoff return flows through the drain system.

Historical and Cultural Resources

The HPID infrastructure was constructed in the 1900s and put into operation in 1908. There have been numerous changes made to the delivery system since it was first constructed. To this point there has not been any components of the HPID infrastructure nominated or listed as having historical significance. Additionally, work has been done within the project are and within the tunnels of the Main Canal within the last 30 years. The current structures and canals are considered working irrigation infrastructure and are subject to change based on operations and improvement required to maintain operation of the HPID system.

There are no known Native American sacred sites or burial grounds within the identified project area. Additionally, there is no tribal or trust lands located within or adjacent to the project. Therefore no detrimental impact will result to tribal or Native American sites as result of the project.

There are no unique natural features, wilderness or public lands within the Tunnel 2 project area. All District facilities, canals, and irrigated infrastructure within the immediate project area are located outside the Yellowstone River floodplain. No construction, excavation, or fill activities associated with the Tunnel 2 project will occur within a designated floodplain area.

Demographics & Social Structure

The Tunnel 2 Lining Project is located in Yellowstone County and includes the towns of Huntley, Worden, Ballantine, and Pompey's Pillar, Montana in a historically rural

agricultural area. The project is likely to create short-term construction work for local laborers and operators during installation of the project. Additionally, completion of the Tunnel 2 project will ensure the continued operation of the HPID for future generations which is a critical component to the local economy.

CERTIFICATE

The undersigned, Cody Kuntz and Liz Freeman, hereby certify that they are the President and Secretary, respectively of the Board of Commissioners (Board) of Huntley Project Irrigation District and that at a regular meeting of the Board, held in Ballantine, MT on January 13, 2016, a quorum of the Board was present and the following Resolution was regularly moved, seconded, and adopted by a majority vote.

RESOLUTION

WHEREAS, the Board is the governing body of Huntley Project Irrigation District by the authority of its Bylaws; **AND**

WHEREAS, the Board has legal authority and desire to enter into the Bureau of Reclamation's WaterSMART program for FY2016; **AND**

WHEREAS, a grant proposal entitled "Tunnel 2 Rehabilitation Project" has been reviewed by the Board; **AND**

WHEREAS, the Board understands that a grant of up to 50 percent of the total cost of the grant proposal will be paid by the Bureau of Reclamation to the HPID as satisfactory progression of the project is made; **AND**

WHEREAS, the HPID expects to enter into an agreement with the Bureau of Reclamation if the grant is awarded, for the purpose of, among other items, scheduling the completion of the project; **NOW THEREFORE BE IT**

RESOLVED, that the Board supports "Tunnel 2 Rehabilitation Project" and that an application be made to Bureau of Reclamation for assistance under the WaterSMART Program; **NOW THEREFORE BE IT FURTHER**

RESOLVED, that the Board verifies the HPID has the capability to provide the funding and in-kind contributions specified in the funding plan; **NOW THEREFORE BE IT FURTHER**

RESOLVED, that the Board authorizes its President, Cody Kuntz, to enter into an agreement with the Bureau of Reclamation to perform the activities described in HPID's "Main Canal Tunnel 2 Rehabilitation" WaterSMART Program application.

Dated this 13th day of January, 2016.

Cody Kuntz, President

ATTEST:

Liz Freeman, Secretary