D.2.2.2. Title Page

HVID Lateral 11.9 Pipeline Conversion Project

Project Location: Lewis & Clark County, Montana

BUREAU OF RECLAMATION

WaterSMART GRANT APPLICATION

WATER and ENERGY EFFICIENCY GRANTS FY2020

Funding Opportunity Announcement No. BOR-DO-21-F001

Applicant:
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Congressional Districts of Applicant: Montana At-Large

Congressional Districts of Project Area: Montana At-Large

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D.2.2.4 TECHNICAL PROPOSAL AND EVALUATION CRITERIA

D.2.2.4.1 EXECUTIVE SUMMARY

The executive summary should include:

- The date, applicant name, city, county, and state
- A one paragraph project summary that provides the location of the project, a brief description of the work that will be carried out, any partners involved, expected benefits and how those benefits relate to the water management issues you plan to address.
- State the length of time and estimated completion date for the proposed project
- Whether or not the proposed project is located on a Federal facility

Date: September 17, 2020

Applicant Name: Helena Valley Irrigation District (HVID)

City, County and State: Helena, Lewis & Clark County, Montana

Project Summary: The HVID is requesting funding for the construction of a pipeline to replace the existing open ditch of Lateral 11.9 (17,550 feet long) located approximately 5.5 miles northeast of the City of Helena, Montana. The proposed pipeline conversion project has been identified by the HVID as one of the top priorities for the HVID system due to significant water losses, high O&M costs, safety hazards, and flooding issues for nearby residents that are associated with the Lateral 11.9 Turnout Structure and Canal. Currently, the canal seepage is a major issue due to the extremely porous soils located in the area. The seepage wastes large quantities of water and creates major operational and maintenance issues for the HVID staff. Converting Lateral 11.9 to a pipeline system will eliminate seepage, significantly increase water delivery efficiency, maximize usage of water being diverted from the HVID main canal, increase on-farm efficiency, and mitigate flooding damage to residents. Additionally, the existing Lateral 11.9 Turnout Structure is an aging concrete structure, that has a heavily deteriorated, manual crank Waterman gate system used to regulate flows in the lateral. The gate is not able to close completely and is ineffective at controlling water levels. Manual operation of the Lateral 11.9 Turnout is time consuming, expensive, and dangerous for HVID staff due to its remote location, condition, and proximity to high velocity flows (i.e. main canal). The existing turnout structure will be replaced with an automated gate that can automatically regulate flows through the gate along with being SCADA capable. The proposed project will conserve large quantities of water, preserve supplemental sources of supply such as Prickly Pear Creek, Lake Helena, and others; increase crop production due to adequate water supplies; and provide a safe operating condition for HVID personnel.

Length of Time and Estimated Completion Date: It is anticipated that the project will take approximately two years and will be completed by December 2022.

Is the Project Located on a Federal Facility? Yes, the project is located on a Federal facility.

D.2.2.4.2 Project Location

Provide detailed information on the proposed project location or project area including a map showing the geographic location. For example, {project name} is located in {state and county} approximately {distance} miles {direction, e.g. northeast} of {nearest town}. The project latitude is {##°##'N} and longitude is {###°##'W}.

The Lateral 11.9 Turnout is located approximately 530 feet downstream of the regulating reservoir outlet works structure. The lateral then spans for approximately 3.32 miles to the north before discharging into an open field that drains into Lake Helena. The project is located in Lewis & Clark County, Montana approximately 5.5 miles northeast of the City of Helena, Montana within the Upper Missouri River Basin (Hydrologic Unit Code (HUC) 10030101). More specifically, the headgate is located within Section 08 of Township 10 North, Range 2 West; and the lateral canal is located within Sections 08 and 05 of Township 10 North, Range 2 West, as well as Sections 32, 31, and 30 of Township 11 North, Range 2 West. The project is located at a latitude and longitude of approximately 46˚38'11.95"N and 111˚53'2.24"W, respectively. The proposed project extents, Lateral 11.9 Turnout, and HVID Main Canal locations are shown on Figure 1 and Exhibit 1.

D.2.2.4.4 Technical Project Description

Provide a more comprehensive description of the technical aspects of your project, including the work to be accomplished and the approach to complete the work. This description should provide detailed information about the project including materials and equipment and the work to be conducted to complete the project. This section provides an opportunity for the applicant to provide a clear description of the technical nature of the project and to address any aspect of the project that reviewers may need additional information to understand.

Please do not include your project schedule and milestones here; that information is requested in response to the Readiness to Proceed criterion below. In addition, please avoid discussion of the benefits of the project, which are also requested in response to evaluation criteria. This section is solely intended to provide an understanding of the technical aspects of the project.

Please note, if the work for which you are requesting funding is a phase of a larger project, please only describe the work that is reflected in the budget and exclude description of other activities or components of the overall project.

The proposed project will include the conversion of an approximate 3.32-mile length of open ditch lateral system to a pipeline to facilitate more efficient irrigation of 420 downstream acres. The proposed pipeline is necessary in order to mitigate significant seepage, to facilitate more consistent water delivery, and to reduce water delivery

times to the downstream acres. The project will consist of general excavation, site grading, pipeline installation, replacement of the existing turnout structure, placement of fill material, and revegetation of the site. The project steps will include completing regulatory requirements, survey, design, construction of the pipeline; and project management and closeout items such as grant reporting, site inspection, and development of as-built drawings. A schematic drawing of the proposed Lateral 11.9 Pipeline is provided on Exhibit 1.

The source of supply for the Helena Valley Irrigation District comes from Canyon Ferry Reservoir, where it is discharged through a pipe to a turbine pump facility on the river that pumps water up over the ridge into the Helena Valley where the water discharges into the Helena Valley Regulating Reservoir. The Bureau of Reclamation (BOR) constructed the water delivery system between 1957-1959 and immediately transferred the system to the HVID for operation and maintenance. The system begins at the pump intake located on the Missouri River below Canyon Ferry Dam. Water then travels by tunnel and canals to the Helena Valley Regulating Reservoir, where it is discharged into the main canal as needed. The 92 miles of main canal and laterals span nearly the entire Helena Valley and serve 450 users and 18,000 acres. Eventually, water that goes unused is discharged into Lake Helena. The water rights for the HVID include the right to use up to 103,359 acre-feet based on the maximum volume used in 1973. The duration of the irrigation season varies from year to year but lasted 153 days in 2019 from May to September. The irrigation infrastructure has deteriorated as expected over the past 61 years as the design life of each piece is being reached, and the Lateral 11.9 Turnout is no exception. Lateral 11.9 is the first turnout from the outlet of the regulating reservoir.

Problems and Needs

The Lateral 11.9 Pipeline Conversion Project has been identified by the HVID as one of the district's highest-priority projects due to its importance to the water delivery system, the inefficient management practices required to operate it, and the flood damage problems and water conservation issues that stem from severe seepage losses. The open channel delivery system and porous soils currently allow large quantities of water to infiltrate into ground. The seepage does not allow the HVID to conserve water and causes hundreds of acre-feet to go unused each year. The large losses in water are negatively impacting crop yields for users due to crop strain that takes place on water-short days. Additionally, there are numerous residents with basements who live next to Lateral 11.9 that are facing flooding problems. The elevated shallow groundwater levels directly resulting from the lateral seepage causes flood damage to nearby residential areas annually. Furthermore, the headgate and canal require manual operation which include driving the entire canal daily, as well as hand-adjustments to the gate position to anticipate water demands for the day. Manual operation of Lateral 11.9 is time consuming for the HVID's very limited resources. Due to limited resources, the HVID is unable to adjust the gate as often as needed by users, so the standard practice of leaving the gate open more than necessary was adopted to meet irrigation demands. This practice is not only inefficient and wastes hundreds of acre-feet of water each year, but it is not always effective as there are still water-

short days due to the heavy seepage losses. Manual operation puts the 420 downstream acres served by Lateral 11.9 in a state of flux due to not knowing if adequate water will be supplied for the day, which can ultimately strain crops and negatively impact crop production. In addition to the seepage and management problems associated with the proposed project, the wasted water could be used for other purposes such as augmenting flows, providing water supplies to industrial or public irrigation purposes, and/or providing fish and wildlife habitat in the Helena Valley Regulating Reservoir, Lake Helena, and Prickly Pear Creek.

The seepage from Lateral 11.9 is so severe that the HVID starts putting 3-4 cfs into the lateral for approximately 20-30 days prior to a call on water at the beginning of the season just to be able to get water to Harmony Road, approximately 3.3 miles downstream from the headgate as shown on Exhibit 1. It typically takes this amount of time for water to even show up at Harmony Road at this flowrate. This process is required in order to saturate the underlying soil medium in order to minimize the amount of seepage that occurs within the lateral system. As demand increases, the amount of water must be increased appropriately (about 4 times more water than is necessary) in order to deliver the amount requested. This often takes some trial and error, as the lateral loses so much water that it is difficult to predict the amount of water that it will take to be able to satisfy the water requested. As the season goes on, the lateral tends to lose less water than at the beginning of the season, but it is still significant (more than 50% loss).

Lateral 11.9 also traverses through residential areas and the Fox Ridge Golf Course while conveying flows to irrigation users. The porous soils within the project area are allowing seepage to occur, which is causing large quantities of water to be lost each year. The seepage is also raising groundwater depths, which is causing flood damage to houses with basements adjacent to the lateral.

Specific Activities that will be Accomplished

Design/Permitting/Construction Oversight: The HVID will contract with a licensed Professional Engineer to complete the design of the Lateral 11.9 Pipeline Conversion Project. The Engineer will be responsible for the design of the proposed project, which will include, but is not limited to, surveying, geotechnical analysis, environmental considerations, hydrology and hydraulics, structural analysis, permitting, and construction administration duties. The Engineer will work with regulatory agencies to complete environmental compliance. The Engineer will provide a final plan set and specifications for the proposed project to facilitate construction. The Engineer will also provide advisory services during construction of the project to assure proper installation.

Construction: The HVID has an experienced earthwork construction crew that will perform the work. The HVID has experienced equipment operators and laborers that perform all the HVID's construction tasks. Recent improvements completed by the HVID include improvements to the Helena Valley Regulating Reservoir outlet structure, HVID Pumping Plant Pump No. 2 Rehabilitation, various check structure and wasteway rehabilitation projects, canal lining projects, road construction and other various

construction and maintenance projects. The project will consist of the installation of 17,550 lineal feet of pipe within the existing lateral ditch alignment. In order to complete the project, the HVID will need to purchase the following materials:

- 8,000 lineal feet of 30" Trans-21 DR-51 80 PSI AWWA C900 Plastic Pipe
- 9,550 lineal feet of 24" 80 PSI Plastic Irrigation Pipe
- 17 cleanouts (every 1,000 lineal feet of pipeline)
- Seed for revegetation
- Pipe bedding for rocky areas

The HVID will utilize the following equipment to perform the work:

- 2009 Dodge Ram 3500 Truck and 2001 Trail-Eze 3-axle Trailer to haul pipe and materials to and from the work site.
- 2015 Nissan Frontier Pickup and 2012 Nissan Titan Pickup to transport equipment operators and laborers to and from the project work site.
- 1992 Ford L-9000 Dump Truck (10 cubic yard capacity) to haul materials to and from the project work site.
- 2005 Case 580M Backhoe to load and unload materials
- 2016 Volvo EC160EL Excavator for pipe installation and miscellaneous excavation work.
- 1994 John Deere 490E Excavator to excavate the primary pipe trench and for miscellaneous excavation.
- 1954 D4 Dozer to provide grading ahead of excavation and pipe laying activities within the hilly terrain portion of the project to provide an adequate base for excavation.
- 1970 Allis Chalmers M100 Series B Motor Grader to grade the final pipeline surface in preparation for reclamation.

D.2.2.4.5 Evaluation Criteria

E.1.1 Evaluation Criterion A—Quantifiable Water Savings (30 points)

Up to 30 points may be awarded for this criterion. This criterion prioritizes projects that will conserve water and improve water use efficiency by modernizing existing infrastructure. Points will be allocated based on the quantifiable water savings expected as a result of the project. Points will be allocated to give greater consideration to projects that are expected to result in more significant water savings.

The proposed project will result in significant water conservation, improved management, and increased conveyance efficiency. The Lateral 11.9 Pipeline Conversion Project will improve delivery efficiency, drought preparedness, and management of the HVID system. The proposed project will result in water savings of 1,550 (2019) to 1,650

(2018) acre-feet per year that is normally lost to seepage within the project area. Additional project benefits will include increased crop production (estimated at up to 15%), which will lead to increased crop revenue (valued at up to $35,520 per year) and positive regional economic impacts. The proposed project will conserve large quantities of water, preserve supplemental sources of supply such as Prickly Pear Creek, Lake Helena, and others; increase crop production due to adequate water supplies; and provide a safe operating condition for HVID personnel.

Describe the Amount of Water Savings:

For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project.

Please include a specific quantifiable water savings estimate; do not include a range of potential water savings.

Lateral 11.9 currently loses between 1,550 and 1,650 acre-feet per year (based on 2018 and 2019 flow data) of water to seepage within the proposed project area due to well-draining soils and poor channel conveyance. The proposed project would eliminate seepage within the project area by converting the open ditch lateral system to a closed pipeline system. The HVID takes daily water measurements in this portion of the canal both upstream and downstream of the proposed location that validate the water savings stated above. These water measurements are provided in Appendix A.

Describe current losses:

Please explain where the water that will be conserved is currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?

Lateral 11.9 is located just downstream of the Helena Valley Regulating Reservoir and is one of the first laterals in the HVID system. The canal runs to the north through Fox Ridge golf course and other parts of the valley before discharging into a field that eventually drains into Lake Helena. The path that Lateral 11.9 takes is made up of porous soils that allow extreme seepage to occur. Lateral 11.9 traverses a portion of the Helena Valley that contains highly porous soils such as Assiniboine-Chinook, Georock-Crago, and Crago-Musselshell that are the direct result of glacial activity. Large quantities of water are wasted each year as a result of the seepage. Poor water delivery efficiency is a direct result of the open channel delivery system currently being utilized for Lateral 11.9. Implementing the proposed canal conversion portion of the project will allow the HVID to have minimal losses delivering water to users due to the high efficiency of a closed pipeline system. Flow data and measurements taken by the HVID indicate that around 70% of lateral flows are lost to seepage. Based on a 153-day irrigation season with Lateral 11.9 operating at flows ranging from 3 to 23 cfs, between 1,550 and 1,650 acre-feet of water are lost each year to seepage. Implementing the proposed project involves converting the open channel to a closed pipeline system with higher delivery efficiency that eliminates all water contact with the porous soils, which ultimately will allow the HVID to conserve between 1,550 and 1,650 acre-feet of water annually. The HVID will record water savings and delivery efficiency each year. An interview with HVID ditch rider Glen Hart (HVID ditch rider

responsible for Lateral 11.9 for the past 20 years) indicates that Lateral 11.9 rarely if ever discharges downstream, showing that the water entering the lateral is either used by producers or is lost to seepage. Mr. Hart described his process for starting up Lateral 11.9 and running it through the irrigation season in 2020 (as he described it as his typical process), which consists of the following sequences:

- Begin the year by soaking the ditch with 3-4 cfs for approximately 6 weeks to be able to facilitate water delivery. Water does not show up at mile 3 in the lateral until at least 4 weeks in.

- Start off after 6 weeks of soaking the ditch with putting 11 cfs in Lateral 11.9 to be able to get 2 cfs at Harmony Road (3.3 miles downstream), with no diversions in between.

- Measure the 4' Cipoletti weir at the beginning of Lateral 11.9 and the 3' Cipoletti weir near Harmony Road to make sure water deliveries are being made.

- Observed 12 cfs turned into Lateral 11.9 to be able to get 4.5-5 cfs at Harmony Road (3.3 miles downstream) by the beginning of August.

- Observed 4 cfs turned into Lateral 11.9 to be able to get 1.5 cfs at Harmony road (3.3 miles downstream) by the beginning of September.

- Lateral 11.9 ditch losses tend to improve slightly at the season progresses.

Describe the support/documentation of estimated water savings:

Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Note: projects that do not provide sufficient supporting detail/calculations may not receive credit under this section. Please be sure to consider the questions associated with your project type (listed below) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal. *In addition, please note that the use of visual observations alone to calculate water savings, without additional documentation/data, are not sufficient to receive credit under this section. Further, the water savings must be the result of reducing or eliminating a current, ongoing loss, not the result of an expected future loss.*

The HVID keeps records of their measurements for water delivery into Lateral 11.9 every day during the irrigation season. They also track the amount of water that is used by each producer on the lateral throughout the irrigation season. There is a 4' Cipoletti Weir near the headgate for Lateral 11.9 that is used to record flow measurements into the Lateral. There is also an additional 3' Cipoletti Weir downstream near Harmony Road that is located just upstream from where users withdraw from the lateral. Although the Harmony Road Cipoletti Weir measurements

are not recorded, the weir is measured throughout the irrigation season to ensure enough water is being delivered to the downstream irrigators.

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

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

The HVID records daily flow measurements at the 4' Cipoletti weir just below the Lateral 11.9 headgate and at every withdrawal from the lateral. The HVID also takes periodic measurements at the 3' Cipoletti weir just upstream of Harmony Road that occurs just before most of the users take water from Lateral 11.9. Daily flow measurements from 2018, 2019 and 2020 are provided in Appendix A. The HVID has annual flow data measurements that date back to 1958. These records were reviewed and for the sake of brevity only the most current flow records were utilized in this analysis as the historical flow records were very comparable to the recent records. The flow measurements from 2018 and 2019 were utilized to determine the actual water loss. Flow measurements for 2020 were complete through August but did not include the September measurements. However, a review of the 2020 data through August did confirm that the 2020 losses were on par with 2018 and 2019 losses through August of each respective year.

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

The seepage losses from Lateral 11.9 are determined by measurements taken at the head of the lateral, just upstream of Harmony Road which is immediately upstream from where the first user withdraws water from the lateral, and at each point where water is withdrawn from the lateral. The ditch rider for this portion of the system takes daily readings at the 4' Cipoletti Weir at the head of Lateral 11.9 and periodic measurements at a 3' Cipoletti weir just upstream of Harmony Road, and records daily water withdrawals for each user from the lateral. The area soils that Lateral 11.9 traverses through in this area are mostly gravely materials, which are highly conducive to seepage or losses from the canal. There are several withdrawal points downstream of the 3' Cipoletti weir at Harmony Road, and these withdrawals are via pumps into pipelines with flowmeters that are read daily. Therefore, the losses are accounted for by measuring the 4' Cipoletti Weir and subtracting the withdrawals and the measurement at the downstream weir.

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

The proposed project is expected to nearly eliminate the seepage losses found within the existing 3.32-mile section of Lateral 11.9. This expected post-project seepage loss abatement was determined due to past experience with lateral to pipeline conversions. The pipe being proposed for the project is water-tight with gasketed joints that nearly eliminates any water seepage from the pipeline.

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

This length of Lateral 11.9 proposed from replacement is approximately 17,550 feet (3.32 miles). The total loss has been measured between 1,550 acre-feet and 1,650 acre-feet per year in 2018 and 2019. Thus, the average loss per mile is calculated at 467 to 497 acre-feet per mile within the project area for the entire irrigation season (May 1 through September 30 of each year, or 153 days).

e. How will actual canal loss seepage reductions be verified?

The canal loss seepage reductions will be verified the same way that the loss calculations are determined now, through daily flow measurements taken by HVID personnel. The Cipoletti weirs will be replaced with pipeline flow meters.

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

The materials being used will include:

- 8,000 lineal feet of 30" Trans-21 DR-51 80 PSI AWWA C900 Plastic Pipe
- 9,550 lineal feet of 24" 80 PSI Plastic Irrigation Pipe
- 17 cleanouts (every 1,000 lineal feet of pipeline)
- Seed for revegetation
- Pipe bedding for rocky areas
- Concrete for the replaced turnout structure
- Automated slidegate for replaced turnout structure

The materials were verified by Civil Engineers from WWC Engineering.

E.1.2 Evaluation Criterion B—Water Supply Reliability (18 points)

Up to 18 points may be awarded under this criterion. This criterion prioritizes projects that address water reliability concerns, including making water available for multiple beneficial uses and resolving water related conflicts in the region.

Note that an agreement will not be awarded for an improvement to conserve irrigation water unless the applicant agrees to the terms of Section 9504(a)(3)(B) of Public Law 111-11 (see p. 52 of the FOA for additional information).

Please address how the project will increase water supply reliability. Proposals that will address more significant water supply shortfalls benefitting multiple sectors and multiple water users, will be prioritized. General water supply reliability benefits (e.g., proposals that will increase resiliency to drought) will also be considered. Please provide sufficient explanation of the project benefits and their significance. These benefits may include, but are not limited to, the following:

The HVID has measured that flows of 3 cfs or more are required to even reach the downstream end of Lateral 11.9, with losses between 55% to 75% throughout the irrigation season. This makes it difficult for the HVID to manage the 420 downstream acres from this location, leads to unnecessary water waste, and results in poor conveyance and on-farm efficiencies. The proposed project would provide the HVID with a pipeline system capable of nearly eliminating these losses, provide a consistent source of water to downstream users, and increase the timing and efficiency of delivery. Implementation of this project would allow the HVID to be able to deliver a continuous supply of water to downstream users and would significantly reduce water travel time.

1. Will the project address a specific water reliability concern? Please address the following:

    - Explain and provide detail of the specific issue(s) in the area that is impacting water reliability, such as shortages due to drought, increased demand, or reduced deliveries. Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?

      The proposed project will develop a pressurized pipeline system to replace a severely leaking ditch system to improve water delivery and efficiency during drought conditions. Typically, the 420 acres served by this project have difficulty receiving water during the peak irrigation season or during drought conditions due to the extensive water loss within the lateral system. The proposed project would provide a reliable source of water that would be used to consistently deliver water to downstream users. The HVID has trouble delivering water to downstream users through Lateral 11.9 throughout the irrigation season due to the extensive ditch loss. This makes it difficult for the HVID to manage the 420 downstream acres from this location, leads to unnecessary water waste, and results in poor conveyance and on-farm efficiencies. Implementation of the proposed pipeline system would allow the HVID to deliver a continuous supply of water to downstream users, would nearly eliminate ditch losses, and would nearly eliminate water travel time to the downstream acres served by Lateral 11.9. The losses in Lateral 11.9 further complicate water deliveries, making it difficult to supply the required

amount of water to the 420 acres downstream of the project. The proposed pipeline system solves both water loss and water delivery issues for this portion of the irrigation area.

- Describe how the project will address the water reliability concern? In your response, please address where the conserved water will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.

The proposed project will address water reliability by providing a closed conduit for water to the point of delivery. As previously stated, the HVID has had trouble delivering water to the downstream end of Lateral 11.9 due to the heavy seepage losses. During periods of peak demand and high heat, this can result in stress on the downstream crops, as they can be without water for up to 24 hours or more that is required to push the amount of water down lateral to satisfy irrigation demand. The water conserved from this effort will be used to fully satisfy the 420 acres that are served by Lateral 11.9 as well as for the multiple beneficial uses throughout the HVID system that include augmentation of flows for Prickly Pear Creek, preservation of aquatic wildlife habitat in the Helena Regulating Reservoir, Lake Helena, and Prickly Pear Creek, water supply to the City of Helena, provide water to users who are water short for agricultural beneficial use, provide water for urban housing developments, provide water for industrial entities, provide water for the irrigation of public facilities such as the Helena Siebel Soccer Complex and other uses.

- Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.

The conserved water will remain stored in the Helena Regulating Reservoir for other beneficial uses or will be left in the HVID main canal for supply to the remaining portion of the HVID system, which is primarily downstream from the Lateral 11.9 headgate, located near the upstream end of the HVID system.

- Indicate the quantity of conserved water that will be used for the intended purpose.

The entire 1,550 to 1,650 acre-feet of water per year (100%) that is saved through the implementation of this project will be used both upstream and downstream of the project location on irrigated acreage and/or beneficial uses within the HVID boundary.

2. Will the project make water available to achieve multiple benefits or to benefit multiple water users? Consider the following:
   - Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?

The water conserved from this effort will be used to fully satisfy the 420 acres that are served by Lateral 11.9 as well as for the multiple beneficial uses throughout the HVID system that include augmentation of flows for Prickly Pear Creek, preservation of aquatic wildlife habitat, water supply to the City of Helena, provide water to users who are water short for agricultural beneficial use, provide water for urban housing developments, provide water for industrial entities, provide water for the irrigation of public facilities such as the Helena Siebel Soccer Complex and other uses.

- Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular recreational, or economic importance)? Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project.

  There are multiple species of concern within Townships 10-11 North, Range 2 West where the project occurs as identified by the Montana Natural Heritage Program website, MTNHP.org. These species include the Spotted Bat, Townsend's Big-eared Bat, Black-tailed Prairie Dog, Hoary Bat, Little Brown Myotis, Clark's Grebe, Golden Eagle, Great Blue Heron, Veery, Pileated Woodpecker, Peregrine Falcon, Clark's Nutcracker, Long-billed Curlew, Foster's Tern and Westslope Cutthroat Trout. It is unlikely that the proposed pipeline project would impact the species of concern either positively or negatively due to the nature of the species identified and the extent of ditch systems, water resources and other habitat within the area.

- Will the project benefit a larger initiative to address water reliability?

  One of the primary initiatives for the Bureau of Reclamation is to improve water reliability, water supply and quality throughout the West. This project will provide improved water reliability for a portion of the HVID system, which is a Reclamation project.

o Will the project benefit Indian tribes?

The proposed project will neither benefit, nor negatively impact, Indian Tribes.

o Will the project benefit rural or economically disadvantaged communities?

The proposed project will provide benefits to several local sectors including the local and regional economies and agriculture. The Lateral 11.9 Pipeline Conversion Project will improve agricultural production by approximately 15% on 420 acres served by Lateral 11.9 through water conservation, improved management, and increased efficiencies. During construction, the proposed project will have a positive economic impact on the local community through local implement dealers, commercial trucking, local stores, etc. Once

complete, users of the system will be able to increase crop production by approximately 15% due to increased water availability and reliable water head in the pipeline that will lead to increased revenue. The primary crops grown within the Lateral 11.9 portion of the HVID system are alfalfa hay. The proposed project will lead to a 15% increase in production of these crops, therefore sustaining the agricultural economy in the area, providing forage crops (hay) to feed livestock in the region, which in turn provides meat to the citizens of Montana. An economic analysis of the downstream acres impacted by this project resulted in an increased annual agricultural revenue because of the 15% increase in crop production.

- Describe how the project will help to achieve these multiple benefits. In your response, please address where the conserved water will go and where it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.

  The water conserved from this effort will be used to fully satisfy the 420 acres that are served by Lateral 11.9 as well as for the multiple beneficial uses throughout the HVID system that include augmentation of flows for Prickly Pear Creek, preservation of aquatic wildlife habitat, water supply to the City of Helena, provide water to users who are water short for agricultural beneficial use, provide water for urban housing developments, provide water for industrial entities, provide water for the irrigation of public facilities such as the Helena Siebel Soccer Complex and other uses.

3. Does the project promote and encourage collaboration among parties in a way that helps increase the reliability of the water supply?

The HVID attends and actively participates in training seminars, courses, and conferences such as Montana Water Resources Association (MWRA), Montana Association of Dams and Canal Systems (MADCS), the US BOR Montana Area Office's Dam Operator Trainings, and watershed symposiums throughout Montana where they collaborate and share information. One of the primary topics as of late is the implementation of mid-line storage projects to facilitate faster and more consistent water delivery. The HVID is committed to sharing the success and implementation of this project with other districts and water user associations throughout the region to assist them in their planning and water delivery efforts.

- Is there widespread support for the project?

  The HVID Board, the Lewis & Clark Conservation District and the NRCS have all shown support for this project.

- What is the significance of the collaboration/support?

The Lewis & Clark Conservation District works with not only other water users in the area but also shares their success stories with the other conservation districts throughout the State through the Montana Association of Conservation Districts. This information will be shared with the other conservation districts who in turn will share this information with nearly all of the remaining irrigation districts and water user associations throughout the State of Montana.

The NRCS is watching this project closely to determine the actual benefits of the proposed pressurized pipeline for irrigation delivery. The NRCS is a national organization that provides training and knowledge sharing throughout the US, and this information would be shared with the national program and neighboring states that could benefit a broad audience of water users.

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

The implementation of this project and the sharing of its benefits through the Montana Association of Dams and Canal Systems (MADCS), Montana Water Resources Association, the Montana Association of Conservation Districts, and the NRCS provides a large audience to share this information with in order for them to learn from the project and evaluate mid-line storage projects for a number of irrigation districts and water users associations throughout the western US.

- Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?

The proposed pipeline system will mitigate heavy seepage losses and provide more timely and consistent water deliveries to the downstream system. During periods of drought or periods of high heat index during later summer months, crops are at a critical growth period that are heavily influenced by the frequency and/or amount of water that they receive. The delay or lack of available water during these critical growth periods can heavily influence crop yields. The proposed pipeline system would mitigate this issue and provide more timely and consistent water delivery.

The water within the Upper Missouri River Basin that serves the HVID is in high demand. There have been a number of litigation suits over water use within the basin due to the lack of available water within the basin. However, as the proposed project would involve a reduction in water lost from the system, this work is anticipated to benefit water related crises or conflicts.

Lateral 11.9 traverses through the vast majority of residential housing adjacent to the Fox Ridge Golf Course. Every year, the HVID is hounded by residents within the area due to flooded basements. Lawsuits have been threatened by homeowners within this area. The proposed project will provide relief to this area by reducing seepage losses and managing a lower water table within the Fox Ridge Golf Community.

- Describe the roles of any partners in the process. Please attach any relevant supporting documents.

There are no partners in this process other than the HVID and Reclamation.

4. Will the project address water supply reliability in other ways not described above?

The proposed project will allow the HVID to save hours for the management of water to be spent on water supply reliability in other areas of their delivery system. The significant losses from the lateral system reduce the overall capacity of the HVID to serve others within the system. However, implementation of the proposed pipeline will allow the HVID to capture this wasted water and utilize it elsewhere within the system.

The proposed project is expected to have positive impacts to the overall HVID system but will have more specific positive impacts to 420 acres served by Lateral 11.9. As a result of the proposed project, Lateral 11.9 users will have a reliable source of irrigation water, improved efficiency, improved drought preparedness, increased crop production and crop revenue, as well as improved management of the HVID system. The proposed project will have a positive impact on the regional economy through increased agricultural revenues that will have a trickle-down effect throughout the region.

E.1.3 Evaluation Criterion C—Implementing Hydropower (18 points)

Up to 18 points may be awarded for this criterion. This criterion prioritizes projects that will install new hydropower capacity in order to utilize our natural resources to ensure energy is available to meet our security and economic needs.

If the proposed project *includes construction or installation of a hydropower system,* please address the following:

The proposed project will not initially include the construction or installation of a hydropower system. However, the HVID has proposed to evaluate this situation further and leave a placeholder for future installation that will be designed into the system. The following information describes the power generation expected from the new pipeline system. HVID will contact Reclamation at a future date to pursue permitting through the Lease of Power Privilege (LOPP) process.

Describe the amount of energy capacity. For projects that implement hydropower systems, state the estimated amount of capacity (in kilowatts) of the system. Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.

The energy capacity of the proposed pipeline system has been evaluated to determine if hydropower could be added to the system. The proposed pipeline project would develop approximately 65 feet of head with flows ranging from 3 cfs to 23 cfs. The maximum power capacity from a proposed hydropower unit located near the end of

the pipeline would generate a peak capacity of a little over 85.5 kW of electricity. Hydropower calculations are provided in Appendix A.

Describe the amount of energy generated. For projects that implement hydropower systems, state the estimated amount of energy that the system will generate (in kilowatt hours per year). Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate. Please explain how the power generated as a result of this project will be used, including any existing or planned agreements and infrastructure.

The energy capacity of the proposed pipeline system has been evaluated to determine if hydropower could be added to the system. The proposed pipeline project would develop approximately 65 feet of head with flows ranging from 3 cfs to 23 cfs. The average power generation from a proposed hydropower unit located near the end of the pipeline prior to lateral diversions would generate a little over 24 kW of electricity on average. Based on an irrigation season of 153 days, this would generate approximately 88,785 kWh of electricity on an annual basis. Hydropower calculations are provided in Appendix A.

Describe any other benefits of the hydropower project. Please describe and provide sufficient detail on any additional benefits expected to result from the hydropower project, including:

- Any expected reduction in the use of energy currently supplied through a Reclamation project.

  N/A

- Anticipated benefits to other sectors/entities.

  The proposed pipeline project will be a pressurized system that will provide a higher head of water for downstream users that will directly result in less power consumption for the downstream irrigation center pivot pumps to direct water for irrigation.

- Expected water needs, if any, of the system.

  N/A

E.1.4 Evaluation Criterion D—Complementing On-Farm Irrigation Improvements (10 points)

Up to 10 points may be awarded for projects that describe in detail how they will complement on-farm irrigation improvements eligible for NRCS financial or technical assistance.

Note: Scoring under this criterion is based on an overall assessment of the extent to which the WaterSMART Grant project will complement ongoing or future on-farm improvements. Applicants should describe any proposal made to NRCS, or any plans to seek assistance from NRCS in the future, and how an NRCS-assisted activity would complement the WaterSMART Grant project. Financial assistance through the

Environmental Quality Incentives Program (EQIP) is the most commonly used program by which NRCS helps producers implement improvements to irrigation systems, but NRCS does have additional technical or financial assistance programs that may be available. Applicants may receive maximum points under this criterion by providing the information described in the bullet points below. **Applicants are *not* required to have assurances of NRCS assistance by the application deadline to be awarded the maximum number of points under this sub-criterion.** Reclamation may contact applicants during the review process to gather additional information about pending applications for NRCS assistance if necessary.

If the proposed project will complement an on-farm improvement eligible for NRCS assistance, please address the following:

- Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.
    - Provide a detailed description of the on-farm efficiency improvements.

      The HVID project provides water to approximately 18,000 acres for irrigation to over 450 water users. Many of the farmers/ranchers within the project have applied for and have received EQIP funding for pivots and other on-farm conservation improvements. The HVID currently has no farmers who are working with the local NRCS to put in on-farm improvements through the EQIP program. However, several farmers have taken advantage of the NRCS EQIP program in the past to install center pivots on lands served by the HVID.

    - Have the farmers requested technical or financial assistance from NRCS for the on-farm efficiency projects, or do they plan to in the future?

      The farmers typically request technical and financial assistance from the NRCS for their on-farm efficiency projects. The local NRCS either performs the technical assistance with in-house staff or utilizes Technical Service Providers.

    - If available, provide documentation that the on-farm projects are eligible for NRCS assistance, that such assistance has or will be requested, and the number or percentage of farms that plan to participate in available NRCS programs.

      After speaking with Rebecka Ayre (September 9, 2020), the local NRCS District Conservationist, past projects involving the construction of pressurized pipelines have increased opportunities for farmers and have resulted in farmers requesting assistance from the NRCS to implement on-farm conservation and efficiency projects. Although Ms. Ayre is new to the Helena office, she has prior experience with pipeline projects where the local farmers who were served downstream of the proposed pipeline had not previously applied for EQIP funding or technical assistance to complete on-farm efficiency projects. However, once the

pressurized pipeline was installed, many of the downstream farmers applied for and obtained NRCS funding and technical assistance for the installation of center pivots. Ms. Ayre attributed this to the additional water and water delivery consistency that the new pressurized pipeline provided. Thus, Ms. Ayre was excited about the proposed project and expects that several of the existing landowners on the downstream end of the proposed pipeline will approach the local NRCS once the project is completed.

- Applicants should provide letters of intent from farmers/ ranchers in the affected project areas.

  None available at this time.

- Describe how the proposed WaterSMART project would complement any ongoing or planned on-farm improvement.
  - Will the proposed WaterSMART project directly facilitate the on-farm improvement? If so, how? For example, installation of a pressurized pipe through WaterSMART can help support efficient on-farm irrigation practices, such as drip-irrigation.

    The proposed project will prevent water shortages through the mitigation of 1,550 to 1,650 acre-feet per year of seepage and will provide a more consistent and timely water delivery. The proposed water pipeline will create approximately 28 psi of pressure near the end of the pipeline that will serve to support efficient on-farm practices such as center pivot irrigation. Based on discussions with Rebecka Ayre, NRCS District Conservationist in Helena, the proposed pipeline provides an optimal situation for farmers who want to put in efficient on-farm irrigation practices such as center pivots.

- OR
  - Will the proposed WaterSMART project complement the on-farm project by maximizing efficiency in the area? If so, how?

    The proposed pipeline conversion project will maximize efficiency in this area by providing seepage mitigation to conserve 1,550 to 1,650 acre-feet per year, provide an increase to water delivery efficiency through significantly reduced delivery times, and increase delivery pressures throughout the pipeline.

- Describe the on-farm water conservation or water use efficiency benefits that would result from any on-farm work.
  - 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.

    Based on information provided by the local NRCS, the construction of a pressurized pipeline would provide more opportunities for landowners to

incorporate on-farm water conservation and/or water use efficiency projects.

- Please provide a map of your water service area boundaries. If your project is selected for funding under this FOA, this information will help NRCS identify the irrigated lands that may be approved for NRCS funding and technical assistance to complement funded WaterSMART projects.

  A map depicting the HVID's water service area boundaries has been provided as Figure 1.

E.1.5 Evaluation Criterion E—Department of the Interior Priorities (10 Points)

Up to 10 points may be awarded based on the extent that the proposal demonstrates that the project supports the Department of the Interior priorities. Please address those priorities that are applicable to your project. It is not necessary to address priorities that are not applicable to your project. A project will not necessarily receive more points simply because multiple priorities are addressed. Points will be allocated based on the degree to which the project supports one or more of the priorities listed, and whether the connection to the priority(ies) is well supported in the proposal.

1. *Creating a conservation stewardship legacy second only to Teddy Roosevelt*

   a. Utilize science to identify best practices to manage land and water resources and adapt to changes in the environment;

      The proposed pipeline system will be designed using engineering science to provide a nearly impermeable pipeline delivery system for the Lateral 11.9 delivery system to prevent the seepage and migration of water. The proposed pipeline was originally derived from reviewing the existing water records and delivery times to the end of the Lateral 11.9 system. The records showed significant losses (over 70%) and long water delivery times to downstream users. This analysis led to the consideration of a piped lateral system to both reduce water delivery times and mitigate the significant seepage, resulting in a scientific analysis that utilizes best practices to manage water resources (pressurized and water efficient pipeline) and adapt to changes in the environment (significant housing developments along Lateral 11.9).

   b. Examine land use planning processes and land use designations that govern public use and access;

      NA

   c. Revise and streamline the environmental and regulatory review process while maintaining environmental standards.

      NA

   d. Review DOI water storage, transportation, and distribution systems to identify opportunities to resolve conflicts and expand capacity;

NA

e. Foster relationships with conservation organizations advocating for balanced stewardship and use of public lands;

NA

f. Identify and implement initiatives to expand access to DOI lands for hunting and fishing;

NA

g. Shift the balance towards providing greater public access to public lands over restrictions to access.

NA

2. *Utilizing our natural resources*

a. Ensure American Energy is available to meet our security and economic needs;

NA

b. Ensure access to mineral resources, especially the critical and rare earth minerals needed for scientific, technological, or military applications;

NA

c. Refocus timber programs to embrace the entire 'healthy forests' lifecycle;

NA

d. Manage competition for grazing resources.

NA

3. *Restoring trust with local communities*

a. Be a better neighbor with those closest to our resources by improving dialogue and relationships with persons and entities bordering our lands;

The HVID Lateral 11.9 traverses through the Fox Ridge Golf Course within the Helena Valley. The Lateral is immediately adjacent to a large portion of the housing developments within Fox Ridge, and there are many residential houses that have basements within the area. At times, the amount of water within Lateral 11.9 and the extensive seepage have resulted in high water table elevations and basement flooding within the area. The proposed pipeline system would provide protection to this housing development by reducing seepage and keeping local water table elevations suppressed. HVID has and will continue to work with this local golf community to ensure a good relationship and consistent water supply to meet their needs.

b. Expand the lines of communication with Governors, state natural resource offices, Fish and Wildlife offices, water authorities, county commissioners, Tribes, and local communities.

NA

4. *Striking a regulatory balance*

a. Reduce the administrative and regulatory burden imposed on U.S. industry and the public;

The proposed pipeline project will purposely follow the existing lateral ditch alignment, thus reducing potential easements and/or permits required to perform the work by keeping construction activities within the footprint of the existing HVID infrastructure.

b. Ensure that Endangered Species Act decisions are based on strong science and thorough analysis.

The HVID has evaluated the impact of this project on the Endangered Species Act to ensure that no harm will come to Endangered Species within the area.

5. *Modernizing our infrastructure*

a. Support the White House Public/Private Partnership Initiative to modernize U.S. infrastructure;

The proposed project is a prime example of a public/private partnership. Half of the funding for the project will be provided by Reclamation, and half of the funding will be provided by the HVID in the form of in-kind services and HVID reserve funding. The project will modernize the existing system by providing a pressurized pipeline system to increase delivery times, mitigate seepage, and provide a pressure basis for downstream efficiency that can be taken advantage of by modern irrigation equipment.

b. Remove impediments to infrastructure development and facilitate private sector efforts to construct infrastructure projects serving American needs;

NA

c. Prioritize Department infrastructure needs to highlight:

1. Construction of infrastructure;
2. Cyclical maintenance;
3. Deferred maintenance.

The HVID will be providing the personnel and equipment for construction of the proposed pipeline system infrastructure. The construction of the pipeline will decrease cyclical maintenance required of the HVID to manage this downstream system. Currently the HVID spends more time than is necessary making sure that water demands are being met, that the water is making it to its destination, and that water deliveries from the HVID system are being managed closely. The proposed pipeline system will allow some flexibility in the system in order to provide short-term water demand with a quick turnaround, and to provide additional head for downstream water delivery.

Reclamation Priorities

1. *Increase Water Supplies, Storage, and Reliability under WIIN and other Authorities*

   The proposed project will increase water supply and reliability by conserving between 1,550 and 1,650 acre-feet per year in water savings. This water can be utilized for other uses within the HVID system such as the City of Helena water supply, irrigation, and supplemental water for Prickly Pear Creek and Tenmile Creek rather than being lost to seepage.

2. *Streamline Regulatory Processes and Remove Unnecessary Burdens to Provide More Water and Power Supply Reliability*

   The proposed project will nearly eliminate the existing significant seepage losses that are occurring in Lateral 11.9 that will provide more water availability within the HVID.

3. *Leverage Science and Technology to Improve Water Supply Reliability to Communities*

   The proposed project will utilize state-of-the-art technology at the turnout (Rubicon slipgate), flowmeters and pipeline materials to improve the water supply reliability for the HVID which supplies water to the City of Helena.

4. *Address Ongoing Drought*

   The proposed project will provide a significant water savings for Lateral 11.9 that will facilitate Drought Preparedness by making more water available.

5. *Improve the Value of Hydropower to Reclamation Power Customers*

   The proposed project will provide for small Hydropower in the future.

6. *Improve Water Supplies for Tribal and Rural Communities*

   N/A

7. *Implementation of new Title Transfer authority pursuant to P.L. 116-9*

   N/A

E.1.6 Evaluation Criterion F—Implementation and Results (6 points)

Up to 6 points may be awarded for these sub criteria.

To successfully implement the proposed project, the following tasks will be necessary:

- Task 1 – WaterSMART Grant Award**.** It is anticipated that the grant awards will be released in April 2021.
- Task 2 – Site Survey. The HVID will contract with a licensed Land Surveyor to complete all necessary surveying at the project site. Surveying will be completed at the end of the irrigation season during October 2021.
- Task 3 – Design. The HVID will contract with a licensed Professional Engineer to develop the final pipeline design and assist with construction management. Design will be completed from October 2021-April 2022.

- Task 4 – Environmental/Regulatory Compliance. The HVID, with assistance from the Engineer, will obtain the required permits and ensure that the project meets all regulatory requirements. This task will run concurrently with Tasks 2 and 3, from December 2021-May 2022.
- Task 5 – Pipeline Construction. The HVID will excavate the existing lateral ditch bed, install pipe with 30 inches of cover, install cleanouts every 1,000 lineal feet, backfill the pipe in accordance with the engineered plans, and reclaim the disturbed area in accordance with the plans and specifications, under the guidance of the Engineer. The pipeline will be constructed from October 2022-April 2023.
- Task 6 – Construction Closeout. The HVID will work with the Engineer to assure that all issues with the installation have been addressed. The Engineer and Surveyor will also develop a set of as-built plans to document any changes made in the field. Construction closeout will occur in May 2023.
- Task 7 – Grant Closeout. The HVID will work with the Engineer to assure that proper documentation including invoices, reports, etc. have been submitted, and the grant will be closed. Grant closeout will be completed in June 2023.
- Task 8 – Project Completion. The estimated project completion is June 2023.

E.1.6.1 Sub criterion F.1 Project Planning

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

Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place? Please self-certify, or provide copies of these plans where appropriate to verify that such a plan is in place.

The HVID has recently completed a Water Conservation Plan (WCP) (2016 Update), an excerpt of which is included in Appendix B. The HVID also conducts a System Optimization Review each year that provides them with a planning process for projects to improve the overall efficiency, conservation efforts, and water delivery of the HVID system.

Provide the following information regarding project planning:

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

The HVID has taken a proactive approach to addressing problems and implementing improvements that are consistent with their ongoing water management, conservation and drought resilience planning. The HVID conducts a System Optimization Review (SOR) each year that provides them with a planning process for projects such as the Lateral 11.9 Pipeline Conversion Project. On an annual basis and as part of their SOR, the HVID district operators all take inventory of potential projects for the following

year. The district operators are tasked with providing a long-range planning list of projects for the next five-year period. Once compiled, the district operators have an annual meeting with the HVID Manager, Jim Foster, and the HVID Board to develop a priority list and make a plan to implement projects based on need, management efficiency, consistency with the HVID WCP and drought resilience plan, and budgetary considerations. Within the past 5 to 10 years, several planning, design, and construction projects were identified through the SOR process. The undertaken projects are consistent with the HVID's water management and drought resilience plan and have greatly improved the HVID's system. In 2018, the Lateral 11.9 ditch rider, Glen Hart, identified the lateral as a priority for rehabilitation due to seepage losses, inefficient water delivery and problems with drought resilience in the area. At last year's annual meeting, the HVID finalized the proposed pipeline project as a high priority because of its amenability with the HVID water management and drought resilience plan. As discussed below, the proposed project will meet all of the goals of the HVID's water management and drought resilience plan: conserve water, improve management, increase irrigation efficiency, maintain infrastructure, provide drought resilience, and improve on-farm efficiencies. The planning efforts made by the HVID such as the SOR and their water management and drought resilience plan reflect the desire to conserve water and improve management within their delivery system. The HVID's planning effort is a living process that is constantly evolving for the betterment of the HVID system and its users.

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

The HVID has identified several projects throughout their system that have been earmarked to be completed in the next five years. The proposed Lateral 11.9 Pipeline Conversion Project has been classified as the highest priority due to the severe water losses, potential benefits, and difficulties stemming from current water management issues. Before selecting a project, the HVID conducts a thorough review of the project to ensure that it is in line with the existing HVID water conservation and drought resiliency plan. The HVID's primary goals when selecting a project are to conserve water, improve management, increase irrigation efficiency, maintain infrastructure, provide drought resilience, and improve on-farm efficiencies. The proposed project will:

- Conserve 1,550 to 1,650 acre-feet per year of water normally lost to seepage, leading to increased efficiency, and ensuring water delivery to downstream users,
- Improve management of the HVID system by substantially decreasing the time it takes to deliver water to downstream users (the project will eliminate significant delays in water delivery time especially at the beginning of the year),
- Improve management and drought resiliency of the HVID system by providing a pressurized pipeline system that can be used to more efficiently deliver water and will improve drought preparedness.

E.1.6.1 Sub criterion F.2—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 (e.g., water saved or better managed, energy generated or saved). For more information calculating performance measure, see *Appendix A: Benefit Quantification and Performance Measure Guidance.*

All Water and Energy Efficiency 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 Water and Energy Efficiency 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 information 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. Quantifying project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of Water and Energy Efficiency Grants.

The performance measures used to quantify the water savings for the proposed regulating reservoir will be the existing measurement stations and District Operator efficiency benchmarks that are used by HVID's management to monitor daily flow measurements in Lateral 11.9. The water savings at Lateral 11.9 will be verified by measurements taken at the head of Lateral 11.9 and at the end of the proposed pipeline at Harmony Road. The ditch rider for this portion of the system takes daily readings at the Cipoletti Weir at the head of Lateral 11.9, at meter pits for each turnout, and periodic readings at a downstream Cipoletti weir that is near Harmony Road. Once the proposed pipeline system is completed, the seepage losses will be mitigated, and the water savings will be verified through new measurement meters that will be installed on the pipeline.

E.1.6.3. Subcriterion F.3— 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.

Please note, if your project is selected, responses provided in this section will be used to develop the scope of work that will be included in the financial assistance agreement.

Applications that include a detailed project implementation plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion.

- Identify and provide a summary description of the major tasks necessary to complete the project. Note: please do not repeat the more detailed technical project description provided in Section D.2.2.4.; this section should be focused on a summary of the major tasks to be accomplished as part of the project.

The proposed Lateral 11.9 Pipeline Conversion Project will consist of the following tasks:

- Planning – The project will require a planning level effort to coordinate activities for the project up-front following award and contracting with Reclamation.
- Survey – The proposed pipeline alignment will need to be surveyed in order to gather the topographic data required for design of the new pipeline.
- Design – The proposed pipeline will need to be designed to reflect the proper alignment and grade, hydraulic profile, and size requirements. A set of plans and specifications will be developed and submitted to HVID and Reclamation for approval.
- Permitting – The necessary permits will need to be obtained in order to facilitate construction of the project. A copy of the permit documents will be submitted to HVID and Reclamation.
- Construction Staking – A surveyor will be needed to set construction stakes for the proposed pipeline to provide the proper alignment and grade for construction.
- Construction – HVID crews will perform construction of the pipeline system.
- Construction Administration – An Engineer will be needed to provide construction administration, inspection of the work, and ensure compliance with the plans and specifications. Photos, submittal approvals, daily logs and other construction information will be saved and compiled throughout the project.
- As-Built Survey – A Surveyor will be needed to perform an as-built survey of the constructed pipeline system. A construction completion report will be submitted to HVID and Reclamation.
- Construction and Grant Close-Out – The HVID or consultant will be required to ensure that all of the requirements of the construction and WaterSmart grant have been completed and submitted to Reclamation for approval.

- Describe any permits that will be required, along with the process for obtaining such permits.

For each of the permits listed below, the HVID will work with each permitting agency to determine whether a formal permit is needed for the construction of the proposed project. If needed, the following permits may be obtained with assistance from the engineer during the design process:

SPA 124 Permit – The Montana Department of Fish, Wildlife & Parks requires a permit for any activity that physically alters or modifies the bed or banks of a perennially flowing stream for a legal public entity. Consultation will be

performed, but the activities proposed herein are likely exempt from this rule. A Montana joint application form will need to be filled out and submitted to FWP for review.

404 Permit – The Army Corps of Engineers (USACE) requires a permit for any activity that will result in the discharge or placement of dredged or fill material into waters of the United States, including wetlands. Consultation will be performed, but the activities proposed herein are likely exempt as stated in CRF 323.4(a)3. A Montana joint application form will need to be filled out and submitted to the USACE for a determination.

318 Authorization – The Short-Term Water Quality Standard for Turbidity requires a permit for any construction activities that will cause temporary violations of state surface water quality standards for turbidity. Since no water will be in the lateral at the time of construction, no turbidity permit will be required.

Storm Water Discharge General Permit – State Storm Water Rules require a storm water discharge permit under the requirements of the 2018 General Permit for any construction project over one acre in total disturbance that discharges into State waters. A Notice of Intent form and Stormwater Pollution Prevention Plan Form along with all attachments and supplements will need to be submitted to the Montana Department of Environmental Quality.

Montana Sage Grouse Habitat Conservation Program - The program's role is to implement Montana's Sage Grouse Conservation Strategy including the conservation, restoration, and mitigation of changes to sage grouse habitat as a result of development. Montana has a website https://sagegrouse.mt.gov/ProgramMap that will need to be consulted prior to construction activities. The current map shows that there are no Sage Grouse Habitat within the project area.

Montana Department of Transportation Encroachment Permit – Since the project crosses under York Road, an encroachment permit will need to be filed with the Montana Department of Transportation. The encroachment permit form as well as supplemental mapping and a description of the activities (slip pipe through existing larger culvert and grout the annulus) will need to be submitted to the MDT Butte Maintenance District for review and approval.

Lewis & Clark County Encroachment Permit - Since the project crosses under Lake Helena Drive, an encroachment permit will need to be filed with Lewis & Clark County. The encroachment permit form as well as supplemental mapping and a description of the activities (slip pipe through existing larger culvert and grout the annulus) will need to be submitted to the Lewis & Clark County Public Works Department for review and approval.

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

The proposed project will require the assistance of an engineer for the design of the new pipeline system. A topographic survey of the proposed pipeline alignment will need to be completed, followed by the design of the proposed pipeline system (including geotechnical, hydrology/hydraulics, site work, alignment/grade, details, etc.), followed by the development of plans and specifications for the proposed pipeline project.

- Describe any new policies or administrative actions required to implement the project.

N/A

Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Milestones may include, but are not limited to, the following: complete environmental and cultural compliance; mobilization; begin construction/installation; construction/installation (50% complete); and construction/installation (100% complete)

Activity	Date(s)
Proposals Due Date	September 17, 2020
Evaluate Grant Applications -- BOR	Sept 17, 2020 – April 2021
Grant Award	May, 2021
Contract Execution	May 2021 – August 2021
Project Initiation	August 2021
Project Kickoff Meeting	September 2021
Project Topographic & Boundary Survey	October 2021
Project Design	Oct 2021 – April 2022
Environmental/Regulatory Compliance	Dec 2021 – June 2022
HVID and Reclamation Plans Review	May 2022 – July 2022
Final Plans & Specifications	August 2022
Order Materials*	August 2022
Begin Construction	October 2022
End Construction	April 2023
Construction Administration	Oct 2022 – April 2023
Construction Closeout	April 2023
As-Built Survey	May 2023
Construction Completion Report	May 2023
Grant Closeout	June 2023
Project Completion	June 2023

*Based on current pipe and materials availability. This may need to be changed pending future supply/demand.

E.1.7 Evaluation Criterion G—Nexus 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.

- Is the proposed project connected to Reclamation project activities? If so, how?

  The HVID is a Transferred Works facility. The Bureau of Reclamation constructed the HVID water delivery system between 1957-1959 and the system was immediately transferred to the HVID after construction was complete. The HVID is part of the Pick-Sloan Missouri River Basin Program that is a general comprehensive plan for the conservation, control, and use of water resources in the entire Missouri River Basin. HVID operates an extensive system of canals and laterals. The HVID was built from 1957 through 1959 and was designed to reclaim land destroyed or inundated by the backing up of water from Canyon Ferry Dam.

- Please consider the following:
  - Does the applicant receive Reclamation project water?

    The HVID does receive Reclamation project water.
  - Is the project on Reclamation project lands or involving Reclamation facilities?

    The project is not located on Reclamation lands, but it does involve Reclamation facilities as described previously.
  - Is the project in the same basin as a Reclamation project or activity?

    Yes, the project is located within the Upper Missouri River watershed, where Reclamation operates Canyon Ferry Dam which supplies water to the HVID.
  - Will the proposed work contribute water to a basin where a Reclamation project is located?

    NA

- Will the project benefit any tribe(s)?

  The proposed project will not benefit any tribes or help Reclamation meet trust responsibilities to any tribes.

E.1.8 Evaluation Criterion H—Additional Non-Federal Funding (4 points)

Up to 4 points may be awarded to proposals that provide non-Federal funding in excess of 50 percent of the project costs. State the percentage of non-Federal funding provided using the following calculation:

Non-Federal Funding/Total Project Cost

$481,761.00/$961,434.50 = **50.11%**

D.2.2.5 PROJECT BUDGET

FUNDING PLAN AND LETTERS OF COMMITMENT

Describe how the non-Federal 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. Letters of commitment shall identify the following elements:

- The amount of funding commitment
- The date the funds will be available to the applicant
- Any time constraints on the availability of funds
- Any other contingencies associated with the funding commitment

Commitment letters from third party funding sources should be submitted with your 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 will not make funds available for an award under this FOA until the recipient has secured non-Federal cost-share. Reclamation will execute a financial assistance agreement once non-Federal funding has been secured or Reclamation determines that there is sufficient evidence and likelihood that non-Federal funds will be available to the applicant subsequent to executing the agreement.

A commitment letter from the HVID is provided in Appendix C.

The HVID staff has the capability and extensive experience to perform all construction activities that will be required for the proposed project. The current HVID staff includes one construction foreman and two (2) heavy equipment operators in addition to administrative staff. The HVID will need to hire two laborers to assist in pipeline installation. One external contract for services will be required for the proposed project. HVID will need to solicit for an engineering consultant to assist with environmental compliance, design, surveying, grant administration, and conduct construction administration for all aspects of the project. The non-Federal share of project costs will be provided by the HVID with in-kind services through construction of the project.

- **The amount of funding commitment**

  Along with the $479,673.50 requested in this grant application, the HVID will contribute $481,761.00 in in-kind services and cash reserves.

- **The date the funds will be available to the applicant**

The HVID has committed $481,761.00 of in-kind services and cash reserves at the time of this application's writing. These funds are available immediately.

- **Any time constraints on the availability of funds**

  There are no time constraints on the availability of funds.

- **Any other contingencies associated with the funding commitment**

  There are no other contingencies associated with the funding commitment.

Commitment letters from third party funding sources should be submitted with your 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 will not make funds available for an award under this FOA until the recipient has secured non-Federal cost-share. Reclamation will execute a financial assistance agreement once non-Federal funding has been secured or Reclamation determines that there is sufficient evidence and likelihood that non-Federal funds will be available to the applicant subsequent to executing the agreement.

Please identify the sources of the non-Federal cost-share contribution for the project, including:

- Any monetary contributions by the applicant towards the cost-share requirement and source of funds (e.g., reserve account, tax revenue, and/or assessments).

  The HVID is providing a $481,761 match that will consist of $336,261 of in-kind services from labor and equipment as well as $145,500 in cash from their reserve fund.

- Any costs that will be contributed by the applicant.

  The HVID is providing a $481,761 match that will consists of $336,261 of in-kind services from labor and equipment as well as $145,500 in cash from their reserve fund.

- Any third-party in-kind costs (i.e., goods and services provided by a third party).

  N/A

- Any cash requested or received from other non-Federal entities.

The HVID has requested $125,000 in grant funds from the Montana Department of Natural Resources and Conservation Renewable Resources Grant & Loan Program. However, the HVID is not counting on these funds to complete the project.

- Any pending funding requests (i.e., grants or loans) that have not yet been approved and explain how the project will be affected if such funding is denied.

  As stated above, the HVID has requested $125,000 in grant funds from the Montana Department of Natural Resources and Conservation Renewable Resources Grant & Loan Program. If this funding is denied, it will not affect the proposed project if WaterSmart funds are awarded. If the RRGL grant is awarded, HVID will use this amount toward their required match. However, if the RRGL grant is not awarded, HVID will utilize reserve funds to satisfy the required match.

In addition, please identify whether the budget proposal includes any project costs that have been or may be incurred prior to award. For each cost, describe:

N/A. No costs will be incurred before the anticipated Project start date.

- The project expenditure and amount.
  N/A
- The date of cost incurrence.
  N/A
- How the expenditure benefits the project
  N/A

BUDGET PROPOSAL

The total project cost (Total Project Cost), is the sum of all allowable items of costs, including all required cost sharing and voluntary committed cost sharing, including third-party contributions, that are necessary to complete the project.

Table 1.—Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	$
Costs to be paid by the applicant	$
Value of third-party contributions	$
TOTAL PROJECT COST	**$**

Table 1. Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	$479,673.50
Costs to be paid by the applicant (in-kind and reserve funds)	$481,761.00
Value of third-party contributions	$0.00
TOTAL PROJECT COST	**$961,434.50**

The budget proposal should include detailed information on the categories listed below and must clearly identify all items of cost, including those that will be contributed as non-Federal cost share by the applicant (required and voluntary), third-party in-kind contributions, and those that will be covered using the funding requested from Reclamation, and any requested pre-awarded costs. Unit costs must be provided for all budget items including the cost of services or other work to be provided by consultants and contractors. Applicants are strongly encouraged to review the procurement standards for Federal awards found at 2 CFR 200.317 through 200.326 before developing their budget proposal. If you have any questions regarding your budget proposal or eligible costs, please contact the grants management specialist identified in Section G. Agency Contacts.

It is strongly advised that applicants use the budget proposal format shown on the next page in Table 2 or a similar format that provides this information. If selected for award, successful applicants must submit detailed supporting documentation for all budgeted costs. It is not necessary to include separate columns indicating which cost is being contributed as non-Federal cost share or which costs will be reimbursed with Federal funds.

The total project cost was determined from material cost estimates, HVID equipment rates, HVID personnel rates, anticipated rental costs, and time durations for the project based on estimates from HVID management and staff.

Table 2. Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	Total Cost
	$/Unit	Quantity		
Salaries and Wages				
Manager – Jim Foster	$28.85	350	Hours	$10,097.50
Administrator – Sharon Foster	$22.60	140	Hours	$3,164.00
Foreman – Ken Olsen	$22.60	1400	Hours	$31,640.00
Operator – Glen Hart	$22.12	1200	Hours	$26,544.00
Operator – Trey Kokoruda	$20.00	1200	Hours	$24,000.00
Laborer 1 – TBD	$18.00	960	Hours	$17,280.00
Laborer 2 – TBD	$18.00	960	Hours	$17,280.00
Fringe Benefits				
Manager – Jim Foster	$9.45	350	Hours	$3,307.50
Administrator – Sharon Foster	$8.38	140	Hours	$1,173.20
Foreman – Ken Olsen	$8.38	1400	Hours	$11,732.00
Operator – Glen Hart	$8.30	1200	Hours	$9,960.00

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	Total Cost
	$/Unit	Quantity		
Fringe Benefits Cont.				
Operator – Trey Kokoruda	$7.93	1200	Hours	$9,516.00
Laborer 1 – TBD	$1.51	960	Hours	$1,449.60
Laborer 2 – TBD	$1.51	960	Hours	$1,449.60
Travel				
NA – Included in Equipment Rates Below	-	-	-	$ -
Equipment				
2009 Dodge Ram 3500	$24.52	300	Hours	$7,356.00
2015 Nissan Frontier (Pickup)	$24.25	120	Hours	$2,910.00
2012 Nissan Titan (Pickup)	$24.25	120	Hours	$2,910.00
1992 Ford L-9000 Dump Truck	$32.67	180	Hours	$5,880.60
2001 Trail-Eze 27,363 GVW 3 Axle Trailer	$4.55	300	Hours	$1,365.00
2005 Case 580M Backhoe	$34.05	600	Hours	$20,430.00
2016 Volvo EC160EL Excavator	$48.61	960	Hours	$46,665.60
1994 John Deere 490E Excavator	$42.84	960	Hours	$41,126.40
1954 Caterpillar D4 Dozer	$36.47	960	Hours	$35,011.20
1970 Allis Chalmers M100 Series B Motor Grader	$33.44	120	Hours	$4,012.80
Supplies and Materials				
30" Trans-21 DR-51 80 PSI AWWA C900 Pipe	$33.79	8000	Lineal Feet	$270,320.00
24" PIP 80 PSI Pipe	$20.67	9550	Lineal Feet	$197,398.50
Cleanouts	$500.00	17	Each	$8,500.00
Rubicon 2.5 ft x 2.5 ft Slipgate	$19,500.00	1	Each	$19,500.00
Stilling Well	$750.00	1	Each	$750.00
Electromagnetic Flowmeter	$6,500.00	2	Each	$13,000.00
Concrete	$250.00	10	Cubic Yard	$2,500.00
Native Seed Mix	$4.00	500	Pound	$2,000.00
Fertilizer	$2.00	400	Pound	$800.00
Contractual/Construction				
Engineer – Principal Engineer	$160.00	40	Hours	$6,400.00
Engineer – Project Manager	$140.00	120	Hours	$16,800.00
Engineer – Project Engineer	$105.00	200	Hours	$21,000.00
Engineer – Surveyor	$140.00	80	Hours	$11,200.00
Engineer – Engineering Project Liaison	$130.00	160	Hours	$20,800.00
Engineer – Administrative	$75.00	70	Hours	$5,250.00
Engineer – Expenses (Mileage)	$0.80	200	Miles	$160.00
Engineer – Expenses (GPS Survey Equipment)	$350.00	4	Days	$1,400.00
Engineer – Expenses (Printing/Copying)	$0.15	300	Each	$45.00
Engineer – Expenses (UTV)	$175.00	4	Days	$700.00
Engineer – Expenses (Survey Lathe, Ribbon, Paint)	$100.00	1	Each	$100.00
Other				
Other	-	-	-	$ -
TOTAL DIRECT COSTS				**$941,434.50**
Indirect Costs				
De Minimis Rate (<10%)	$20,000.00	1	Lump Sum	$20,000.00
TOTAL ESTIMATED PROJECT COSTS				**$961,434.50**

BUDGET NARRATIVE

Submission of a budget narrative is mandatory. An award will not be made to any applicant who fails to fully disclose this information. The budget narrative provides a discussion of, or explanation for, items included in the budget proposal. If in-kind contributions or donations of goods and services are included in the budget proposal, the narrative should identify the source(s) and describe how the value of the goods and services was determined. The types of information to describe in the narrative include, but are not limited to, those listed in the following subsections. Costs, including the valuation of in-kind contributions and donations, must comply with the applicable cost principles contained in 2 CFR Part §200, available at the Electronic Code of Federal Regulations (www.ecfr.gov).

The proposed project will be completed through the use of HVID personnel and equipment. The HVID owns the construction equipment that is necessary to complete the project, and the HVID personnel are trained and experienced at using this equipment. The HVID has their own construction crews to be able to maintain their existing infrastructure and keep costs low, providing a benefit to their users. Therefore, the HVID will be providing their cost share for the project with in-kind and cash reserve contributions. The value of the in-kind services provided by HVID have been split into personnel and equipment. The rates for personnel are provided in Table 2. The in-kind rate used is comprised of the wage rate for each employee in addition to fringe benefits. The equipment rates for HVID equipment have been determined through HVID's costs on each piece of equipment and cross-checked with the current posted USACE rates as recommended in this solicitation. A list of the HVID equipment, age and other information is provided in Table 2. The personnel and material hours estimates were compiled by HVID based on experience with similar projects. Material prices for the project are based on actual quotes and/or rates for materials. The following table in conjunction with Table 2 outlines all items of cost, including those that will be contributed as non-Federal cost share by the applicant (required and voluntary), third-party in-kind contributions, and those that will be covered using the funding requested from Reclamation, and any requested pre-awarded costs.

Budget Item	Applicant In-Kind Services	Applicant Reserve Funds	Reclamation WaterSMART Funds	Third Party Contributions	Total
Construction	$336,261.00				$336,261.00
Supplies/Materials		$35,095.00	$479,673.50		$514,768.50
Engineering		$90,405.00			$90,405.00
Indirect Costs		$20,000.00			$20,000.00
Totals:	**$336,261.00**	**$145,500.00**	**$479,673.50**	**$0.00**	**$961,434.50**

Salaries and Wages

Indicate the program manager and other key personnel by name and title. The Project Manager must be an employee or board member of the applicant. Other personnel should be indicated by title alone. For all positions, indicate salaries and wages, estimated hours or percent of time, and rate of compensation. The labor rates must identify the direct labor rate separate from the fringe rate or fringe cost for each category. All labor estimates must be allocated to specific tasks as outline in the applicant's technical project description. Labor rates and proposed hours shall be displayed for each task.

The budget proposal and narrative should include estimated hours for compliance with reporting requirements, including final project and evaluation. Please see *Section F.3. Program Performance Reports* for information on types and frequency of reports required.

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

The HVID staff that will be used for the proposed project are shown above in Table 2. The direct labor costs have been separated out from the fringe benefits for each employee in the table. The labor estimates have been allocated to each task as shown in Table 2. Each employee has been assigned a task based on their experience and competence. The budget proposal includes hours for compliance with reporting requirements, including final project and evaluation (see Table 2 under contracted services, Engineer – Administrative, 70 hours for this task). A portion of the HVID employees are salaried employees, and the hourly rates have been calculated for these employees based on 2020 salary and direct compensation benefits. HVID labor rates and salaries are included in Table 2.

- HVID Manager: The HVID Manager has over 30 years of construction experience and project management for the HVID. The HVID Manager will be in charge of the overall project and will coordinate daily work.
- Administrative & Assistant Manager: The Administrative and Assistant Manager will provide payroll services and will process invoices and pay requests for the project.
- Foreman: The HVID Foreman has over 25 years of experience in the construction industry, specifically for HVID construction projects. The HVID Foreman will lead the activities on the ground and will be responsible for overseeing the construction. The HVID Foreman is also an experienced operator and will be one of the primary operators involved throughout the entire construction process. The HVID Foreman will provide foreman and operator duties throughout the construction project.

- Operator 1: Operator 1 is an experienced operator that will provide operation of the excavators, dozer, and backhoe equipment for clearing and grubbing, trench excavation, pipe installation, backfill, reclamation, miscellaneous construction, and closeout activities.
- Operator 2: Operator 2 is an experienced operator that will provide operation of the excavators, dozer, and backhoe equipment for clearing and grubbing, trench excavation, pipe installation, backfill, reclamation, miscellaneous construction, and closeout activities.
- Laborers: HVID will be hiring two additional personnel specifically for this project to serve as project laborers. Responsibilities will include preparation for construction activities, assistance with pipe installation, cleanup, and miscellaneous construction support.

Budget hours to complete the work for each HVID employee are shown above in Table 2.

Fringe Benefits

Identify the rates/amounts, what costs are included in this category, and the basis of the rate computations. Federally approved rate agreements are acceptable for compliance with this item.

The fringe benefit rates for each HVID employee have been calculated and provided by HVID. These rates were calculated by HVID payroll personnel based on the year 2020 compensation and are considered provisional rates for billing purposes. The fringe benefits include accident and health benefits, retirement, Medicare, unemployment and workers compensation, de minimis benefits, and other benefits as defined in IRS Publication 15-B.

Travel

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

Travel costs are not included in the proposed budget because they are included in the hourly equipment rates. HVID personnel are required to check in and start their day at the HVID office and will use HVID vehicles and equipment to travel to the job site and perform the work.

Equipment

If equipment will be purchased, itemize all equipment valued at or greater than $5,000. For each item, identify why it is needed for the completion of the Project and how the equipment was priced. *Note: if the value is less than $5,000, the item should be included under materials and supplies.*

If equipment is being rented, specify the number of hours and the hourly rate. Local rental rates are only accepted for equipment actually being rented or leased.

If the applicant intends to use their own equipment for the purposes of the project, the proposed usage rates should fall within the equipment usage rates outlined by the United States Army Corps of Engineers (USACE) within their Construction Equipment Ownership and Operating Expense Schedule (EP 1110-1-8) at www.publications.usace.army.mil/USACE-Publications/Engineer-Pamphlets/u43545q/313131302D312D38.

Note: If the equipment will be furnished and installed under a construction contract, the equipment should be included in the construction contract cost estimate.

HVID intends to use their own equipment for the construction of this project. The equipment rates for HVID owned equipment are shown above in Table 2 as determined from the current USACE Region 4 rates. The HVID equipment will be used for the project as follows:

- 2009 Dodge Ram 3500 Truck and 2001 Trail-Eze 3-axle Trailer to haul pipe and materials to and from the work site.
- 2015 Nissan Frontier Pickup and 2012 Nissan Titan Pickup: To transport equipment operators and laborers to and from the project work site. Will also be used for general site activities, materials, and trips to obtain parts and materials.
- 1992 Ford L-9000 Dump Truck (10 cubic yard capacity): Will provide haul of materials to and from the project site and various materials hauling activities required for the construction.
- 2005 Case 580M Backhoe: Will provide loading and unloading of trucked materials, spreading of materials, and general material handling throughout the construction process.
- 2016 Volvo EC160EL Excavator: Will provide the primary means of excavation for pipe installation and miscellaneous excavation work, will provide clearing and grubbing activities, and will provide miscellaneous load/unload activities at the project site.
- 1994 John Deere 490E Excavator: Will provide the primary means of pipe installation and backfill and will provide miscellaneous load/unload activities at the project site.
- 1954 D4 Dozer to provide grading ahead of excavation and pipe laying activities within the hilly terrain portion of the project to provide an adequate base for excavation and provide for miscellaneous grading activities on the site.
- 1970 Allis Chalmers M100 Series B Motor Grader to grade the final pipeline surface in preparation for reclamation.

Materials and Supplies

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

Note: If the materials/supplies will be furnished and installed under a contract, the equipment should be included in the construction contract cost estimate.

The existing site currently contains adequate fill material for the proposed pipeline system. Therefore, only purchased material costs are included in the proposed budget. All material and supply costs are accounted for in the unit prices provided in Table 2 (Budget Proposal). The material costs were determined as follows:

- 30" Trans-21 DR-51 80 PSI AWWA C900 Pipe: Determined from estimate provided by Specified Pipe & Equipment Company in Bigfork, MT.
- 24" PIP 80 PSI Pipe: Determined from estimate provided by Specified Pipe & Equipment Company in Bigfork, MT.
- Pipe Cleanouts: Determined from estimate provided by Specified Pipe & Equipment Company in Bigfork, MT.
- Rubicon 2.5 ft x 2.5 ft Slipgate: Determined from estimate provided by Rubicon.
- Stilling Well: Determined from estimated provided by TrueNorth Steel, Billings, MT.
- Electromagnetic Flowmeter: Determined from estimate provided by McCrometer, Inc.
- Concrete: Determined from estimate provided by Helena Sand & Gravel, Helena, MT.
- Native seed mix and Fertilizer: Obtained from Murdoch's Farm and Ranch Supply in Helena, MT.

Contractual

Identify all work that will be accomplished by consultants or contractors, including a breakdown of all tasks to be completed, and a detailed budget estimate of time, rates, supplies, and materials that will be required for each task. For each proposed contract, identify the procurement method that will be used to select the consultant or contractor and the basis for selection. Please note that all procurements with an anticipated aggregate value that exceed the Micro-purchase Threshold (currently $10,000) must use a competitive procurement method (see 2 CPR 200.320 – Method of procurement to be followed). Only contracts for architectural/engineering services can be awarded using a qualifications-based procurement method. If a qualifications-based procurement method is used, profit must be negotiated as a separate element of the contract price. See 2 CFR 200.317 through 200.326 for additional information regarding procurements, including required contract content. Note: A modification to an existing contract for services without first obtaining multiple quotes or proposals is considered a noncompetitive procurement, regardless of the method used to award the existing contract.

The HVID will contract with a licensed Professional Engineer to complete the design of the Lateral 11.9 Pipeline Conversion Project by developing a solicitation that will be advertised in the local paper in accordance with Montana Code Annotated

requirements. The Engineer will be responsible for the design of the proposed project, which will include, but is not limited to, geotechnical, environmental considerations, hydrology and hydraulics, site grading, permitting, and construction administration duties. The Engineer will work with regulatory agencies to complete environmental compliance. The Engineer will provide a final plan set and specifications for the proposed project to facilitate construction. The Engineer will also provide advisory services during construction of the project to assure proper installation. A breakdown of the consultant's time, rates, supplies, and materials is included in Table 2. Construction will be performed by the HVID as in-kind services; therefore, a contract with a construction company is not required. The Engineer's services amount to a total cost of $90,500, which is well within the industry standard for A&E Services for design, permitting and construction administration (<20% of construction cost).

Third-Party In-Kind Contributions

Identify all work that will be accomplished by third-party contributors, including a breakdown of all tasks to be completed, and a detailed budget estimate of time, rates, supplies, and materials that will be required for each task. Third-party in-kind contributions, including contracts, must comply with all applicable administrative and cost principles criteria, established in 2 CFR Part 200, available at www.ecfr.gov, and all other requirements of this FOA.

N/A

Environmental and Regulatory Compliance Costs

Prior to awarding financial assistance, Reclamation must first ensure compliance with Federal environmental and cultural resources laws and other regulations ("environmental compliance"). Every project funded under this program will have environmental compliance activities undertaken by Reclamation and the recipient.

Depending on the potential impacts of the project, Reclamation may be able to complete its compliance activities without additional cost to the recipient. Where environmental or cultural resources compliance requires significant participation by Reclamation, costs incurred by Reclamation will be added as a line item to the budget during development of the financial assistance agreement and cost shared accordingly (i.e., withheld from the Federal award amount). Any costs to the recipient associated with compliance will be identified during the process of developing a final project budget for inclusion in the financial assistance agreement.

Environmental and Regulatory compliance for a project of this nature are minimal with respect to the fact that all of the work will be occurring within the existing irrigation ditch alignment. The environmental and regulatory compliance costs were included within Table 2 in the Contracted/Construction section for preparation of permits. Additional costs may be incurred due to BOR's environmental review. These costs include:

- The primary environmental and regulatory compliance costs are included within the Engineer estimates provided in Table 2. These include the preparation of a

Storm Water Pollution Prevention Plan, Consultation with the US Army Corps of Engineers, Consultation with the local Conservation District, consultation with the Montana Department of Environmental Quality, consultation with the Montana Department of Natural Resources and Conservation for Sage Grouse and wildlife habitat (none anticipated, but consultation required), and encroachment permits from Lewis & Clark County and the Montana Department of Transportation for the pipeline to pass under Lake Helena Drive and York Road.

Other Expenses

Any other expenses not included in the above categories shall be listed in this category, along with a description of the item and why it is necessary. No profit or fee will be allowed.

No other costs will be incurred for the proposed project.

Indirect Costs

Indirect costs are costs incurred by the applicant for a common or joint purpose that benefit more than one activity of the organization and are not readily assignable to the activities specifically benefitted without undue effort. Costs that are normally treated as indirect costs include, but are not limited to, administrative salaries and fringe benefits associated with overall financial and organizational administration; operation and maintenance costs for facilities and equipment; and, payroll and procurement services. If indirect costs will be incurred, identify the proposed rate, cost base, and proposed amount for allowable indirect costs based on the applicable cost principles for the applicant's organization. It is not acceptable to simply incorporate indirect rates within other direct cost line items.

If the applicant has never received a Federal negotiated indirect cost rate, the budget may include a *de minimis* rate of up to 10 percent of modified total direct costs. For further information on modified total direct costs, refer to 2 CFR §200.68 available at www.ecfr.gov.

If the applicant does not have a federally approved indirect cost rate agreement and is proposing a rate greater than the *de minimis* 10 percent rate, include the computational basis for the indirect expense pool and corresponding allocation base for each rate. Information on "Preparing and Submitting Indirect Cost Proposals" is available from the Department, the Interior Business Center, and Indirect Cost Services, at www.doi.gov/ibc/services/finance/indirect-cost-services. If the proposed project is selected for award, the recipient will be required to submit an indirect cost rate proposal with their cognizant agency within three months of award. Reimbursement of indirect costs will not be allowable until the recipient enters into the indirect cost rate agreement.

HVID does not have a federally approved indirect cost; therefore, a de minimis rate of less than 10 percent is assumed for this project.

F.2.1 ENVIRONMENTAL & CULTURAL RESOURCES COMPLIANCE

It is understood that Reclamation will be the lead agency on Environmental and Cultural Resources Compliance. In order to facilitate this work, the HVID has provided the following preliminary information:

- The proposed project will have a minimal impact on the surrounding environment. Impacts will be those associated with general excavation and site grading, pipeline installation, concrete construction, and placement of fill material. The proposed project is expected to have minimal impacts and, in some cases, may even have a positive impact on the environment or cultural resources. The work will be limited to the existing right-of-way of the Lateral 11.9 ditch. Care will be taken to minimize impacts and limit the construction footprint wherever possible. During construction, dust may be generated but is expected to be minimal and temporary. Dust control measures will be implemented during construction. The proposed project could potentially have a beneficial impact on animal habitat. The regulating reservoir could provide habitat for waterfowl and other animals in the area.

- Results from the Montana Natural Heritage Program (MTNHP) indicate that there are no known threatened or endangered species within the proposed project area.

- A search of the National Wetland Inventory revealed three wetlands in the project area. The USFWS considers Lateral 11.9 in the project vicinity a freshwater emergent wetland. There are also two small freshwater forested/shrub wetlands below Lateral 11.9 as the ditch approaches Harmony Road. Because HVID irrigation water delivered down the lateral is the only consistent source of water, these wetlands are considered by the HVID to be caused unintentionally as a byproduct of irrigation. The proposed project will include all necessary permits and environmental actions in order to be fully compliant with all rules, regulations, and laws. Based upon the available information, no Waters of the United States are believed to be negatively impacted by the proposed project.

- The proposed project will modify Lateral 11.9 in order to convert the existing open ditch system to a closed pipeline. The proposed project will affect approximately 3.3 miles of Lateral 11.9. Lateral 11.9 was constructed in the 1950s. Past projects on Lateral 11.9 include general rehabilitation projects such as cleaning and reshaping the Lateral 11.9 prism or general maintenance projects that have been completed as recently as last year.

- The district does not have any buildings, structures, or features eligible for listing on the National Register of Historic Places that will be impacted by this project.

- The HVID is not aware of any archeological sites in the proposed project area. If any archeological sites are discovered during construction, work will be halted, and the appropriate environmental process will be followed.
- The proposed project will not have a disproportionately high and/or adverse effect on low income or minority populations. The proposed project will not limit access to or ceremonial use of Indian sacred sites or result in other impacts on tribal lands.
- Care will be taken to prevent the continued existence or spread of noxious weeds or non-native invasive species. During revegetation, only approved native seed mixtures will be used. The HVID's weed management program will be used to control weed and non-native species once the project is complete.

D.2.2.6 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.

Note that improvements to Federal facilities that are implemented through any project awarded funding through this FOA must comply with additional requirements. The Federal government will continue to hold title to the Federal facility and any improvement that is integral to the existing operations of that facility. Please see P.L. 111-11, Section 9504(a)(3)(B). Reclamation may also require additional reviews and approvals prior to award to ensure that any necessary easements, land use authorizations, or special permits can be approved consistent with the requirements of 43 CFR Section 429, and that the development will not impact or impair project operations or efficiency.

For each of the permits listed below, the HVID will work with each permitting agency to determine whether a formal permit is needed for the construction of the proposed project. If needed, the following permits may be obtained with assistance from the engineer during the design process:

310 Permit – The Montana Association of Conservation Districts (MACD) requires a permit for any activity that physically alters or modifies the bed or banks of a perennially flowing stream. Consultation will be performed, but the activities proposed herein are likely exempt from this rule.

404 Permit – The Army Corps of Engineers (ACOE) requires a permit for any activity that will result in the discharge or placement of dredged or fill material into waters of the United States, including wetlands. Consultation will be performed, but the activities proposed herein are likely exempt as stated in CRF 323.4(a)3.

318 Authorization – The Short-Term Water Quality Standard for Turbidity requires a permit for any construction activities that will cause temporary violations of state surface water quality standards for turbidity.

Storm Water Discharge General Permit – State Storm Water Rules require a storm water discharge permit for any construction project over one acre in total disturbance that discharges into State waters.

Montana Sage Grouse Habitat Conservation Program - The program's role is to implement Montana's Sage Grouse Conservation Strategy including the conservation, restoration, and mitigation of changes to sage grouse habitat as a result of development.

Montana Department of Transportation Encroachment Permit – Since the project crosses under York Road, an encroachment permit will need to be filed with the Montana Department of Transportation.

Lewis & Clark County Encroachment Permit - Since the project crosses under Lake Helena Drive, an encroachment permit will need to be filed with Lewis & Clark County.

D.2.2.7 LETTERS OF SUPPORT

Please include letters from interested stakeholders supporting the proposed project. To ensure your proposal is accurately reviewed, please attach all letters of support/ partnership letters as an appendix. Letters of support received after the application deadline for this FOA will not be considered in the evaluation of the proposed project.

Letters of support for the project are included in Appendix D.

LEWIS & CLARK CONSERVATION DISTRICT
790 Colleen Street • Helena, Montana 59601 • 449-5000 ext 5

September 15, 2020

USBOR

RE: USBR WaterSmart Funding for Helena Valley Irrigation District (HVID)

To Whom It Concerns;

The Lewis & Clark Conservation District Board of Supervisors would like to convey their support for the HVID Lateral 11.9 Pipeline Conversion Project.

The projected water savings of 75% is significant and has been identified by the HVID as a top priority. Canal seepage has been an ongoing problem for neighbors, flooding crawlspaces and basements.

If you have further questions, please contact us at 406-449-5000 ext. 5 or via email at chris@lewisandclarkcd.org.

Sincerely,

LEWIS AND CLARK CONSERVATION DISTRICT

Chris Evans
District Administrator

I am a land owner and an irrigator and I support the Helena Valley Irrigation District's efforts to be awarded a WaterSmart Grant to pipe Lateral 11.9 and will all benefit from the considerable water savings.

Thomas E. Nicholls	Sept.17,2020
NAME	DATE

HELENA VALLEY IRRIGATION DISTRICT
RESOLUTION
Resolution - HVID, 2020-02
September 1, 2020

WHEREAS; the Helena Valley Irrigation District has the legal authority to enter into an agreement, and intends to submit a Water Efficiency Grant to the United States Bureau of Reclamation's (USBR) WaterSMART Program in 2020, and;

WHEREAS; the Helena Valley Irrigation District, located in Helena, Montana commits to assisting in the funding of, implementation of, the construction of, operation of, and to performing the future maintenance for the proposed Lateral 11.9 Pipeline Conversion Project per the stipulations of the foregoing grant application (if successful and awarded), and;

WHEREAS; the Helena Valley Irrigation District contributions of cash and in-kind management, labor, and equipment services for the preferred alternative of the aforementioned grant application have been estimated at up to 51% of the total projects per the budgeting calculation forms included in the WaterSMART Grant Application, and;

WHEREAS; the Helena Valley Irrigation District hereby appoints Jim Foster, HVID Manager, as the official with legal authority to enter into an agreement (if successful and awarded);

THEREFORE, BE IT RESOLVED: The Helena Valley Irrigation Commissioners support the application and herby commits to the supply of in-kind labor, management, equipment, and/or cash to satisfy the required match as stipulated in the Funding Plan of the WaterSMART Grant Application submittal for the Lateral 11.9 Pipeline Conversion Project. The Helena Valley Irrigation District has budgeted for the planned capital and resource expenditures and will work with Reclamation to meet the established deadlines for entering into a grant or cooperative agreement.

COMMISSIONERS:

JOHN F. BAUCUS, PRESIDENT — September 1, 2020

MARK T. DIEHL, VICE-PRESIDENT — September 1, 2020

GARY BURNHAM — September 1, 2020

THOMAS E. NICHOLLS — September 1, 2020

CRAIG WINTERBURN — September 1, 2020

ATTEST:

JAMES A. FOSTER, SECRETARY — September 1, 2020

D.2.2.8 OFFICIAL RESOLUTION

Include an official resolution adopted by the applicant's board of directors or governing body, or, for State government entities, an official authorized to commit the applicant to the financial and legal obligations associated with receipt of a financial assistance award under this FOA, verifying:

- The identity of the official with legal authority to enter into an agreement.
- The board of directors, governing body, or appropriate official who has reviewed and supports the application submitted.
- The capability of the applicant to provide the amount of funding and/or in-kind contributions specified in the funding plan.
- That the applicant will work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement.

An official resolution meeting the requirements set forth above is mandatory. If the applicant is unable to submit the official resolution by the application deadline because of the timing of board meetings or other justifiable reasons, the official resolution may be submitted up to 30 days after the application deadline, via email to the contact listed in Section D.1. of this FOA.

An official resolution is provided in Appendix E.

HELENA VALLEY IRRIGATION DISTRICT
RESOLUTION
Resolution - HVID, 2020-02
September 1, 2020

WHEREAS; the Helena Valley Irrigation District has the legal authority to enter into an agreement, and intends to submit a Water Efficiency Grant to the United States Bureau of Reclamation's (USBR) WaterSMART Program in 2020, and;

WHEREAS; the Helena Valley Irrigation District, located in Helena, Montana commits to assisting in the funding of, implementation of, the construction of, operation of, and to performing the future maintenance for the proposed Lateral 11.9 Pipeline Conversion Project per the stipulations of the foregoing grant application (if successful and awarded), and;

WHEREAS; the Helena Valley Irrigation District contributions of cash and in-kind management, labor, and equipment services for the preferred alternative of the aforementioned grant application have been estimated at up to 51% of the total projects per the budgeting calculation forms included in the WaterSMART Grant Application, and;

WHEREAS; the Helena Valley Irrigation District hereby appoints Jim Foster, HVID Manager, as the official with legal authority to enter into an agreement (if successful and awarded);

THEREFORE, BE IT RESOLVED: The Helena Valley Irrigation Commissioners support the application and herby commits to the supply of in-kind labor, management, equipment, and/or cash to satisfy the required match as stipulated in the Funding Plan of the WaterSMART Grant Application submittal for the Lateral 11.9 Pipeline Conversion Project. The Helena Valley Irrigation District has budgeted for the planned capital and resource expenditures and will work with Reclamation to meet the established deadlines for entering into a grant or cooperative agreement.

COMMISSIONERS:

JOHN F. BAUCUS, PRESIDENT — September 1, 2020

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GARY BURNHAM — September 1, 2020

THOMAS E. NICHOLLS — September 1, 2020

CRAIG WINTERBURN — September 1, 2020

ATTEST:

JAMES A. FOSTER, SECRETARY — September 1, 2020

EXHIBITS & FIGURES


Hauser Lake
3734 ft
0 ft
-0.8%
York Rd
280
Wylie Dr
Valley Dr
Lake Helena Dr
5867 ft
1997
2020 Google
Helena Valley Regulating Reservoir
Google Earth
Imagery Date: 7/25/2014 46°39'15.39" N 111°53'29.49" W elev 3786 ft eye alt 25580 ft
Graph: Min, Avg, Max Elevation: 3733, 3746, 3800 ft
Range Totals: Distance: 3.3 mi Elev Gain/Loss: 200 ft, -135 ft Max Slope: 9.3%, -6.8% Avg Slope: 1.7%, -1.4%
3800 ft
3775 ft
3750 ft
3734 ft
3733 ft
-0.8%
11:08 AM
9/9/2020

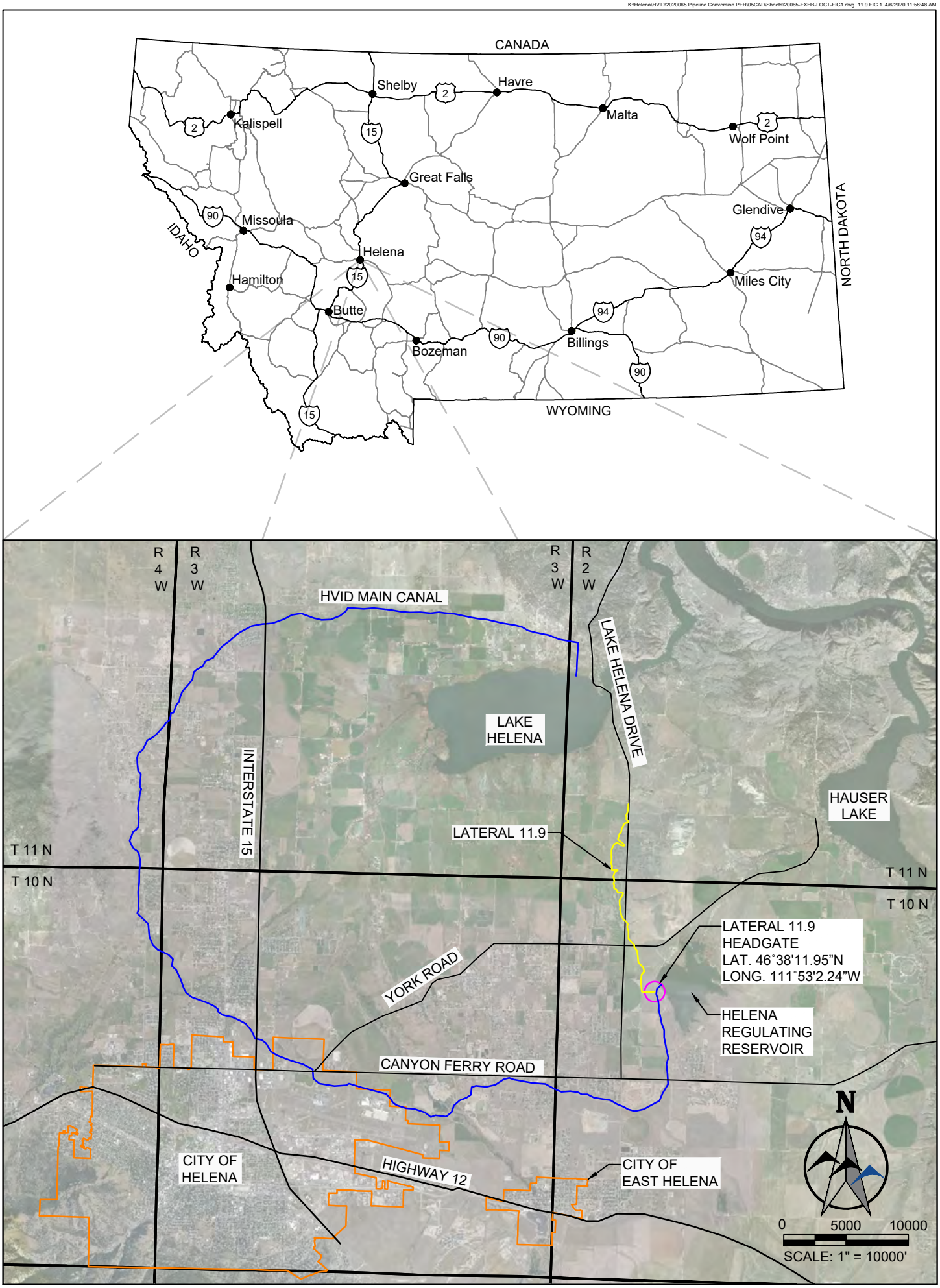
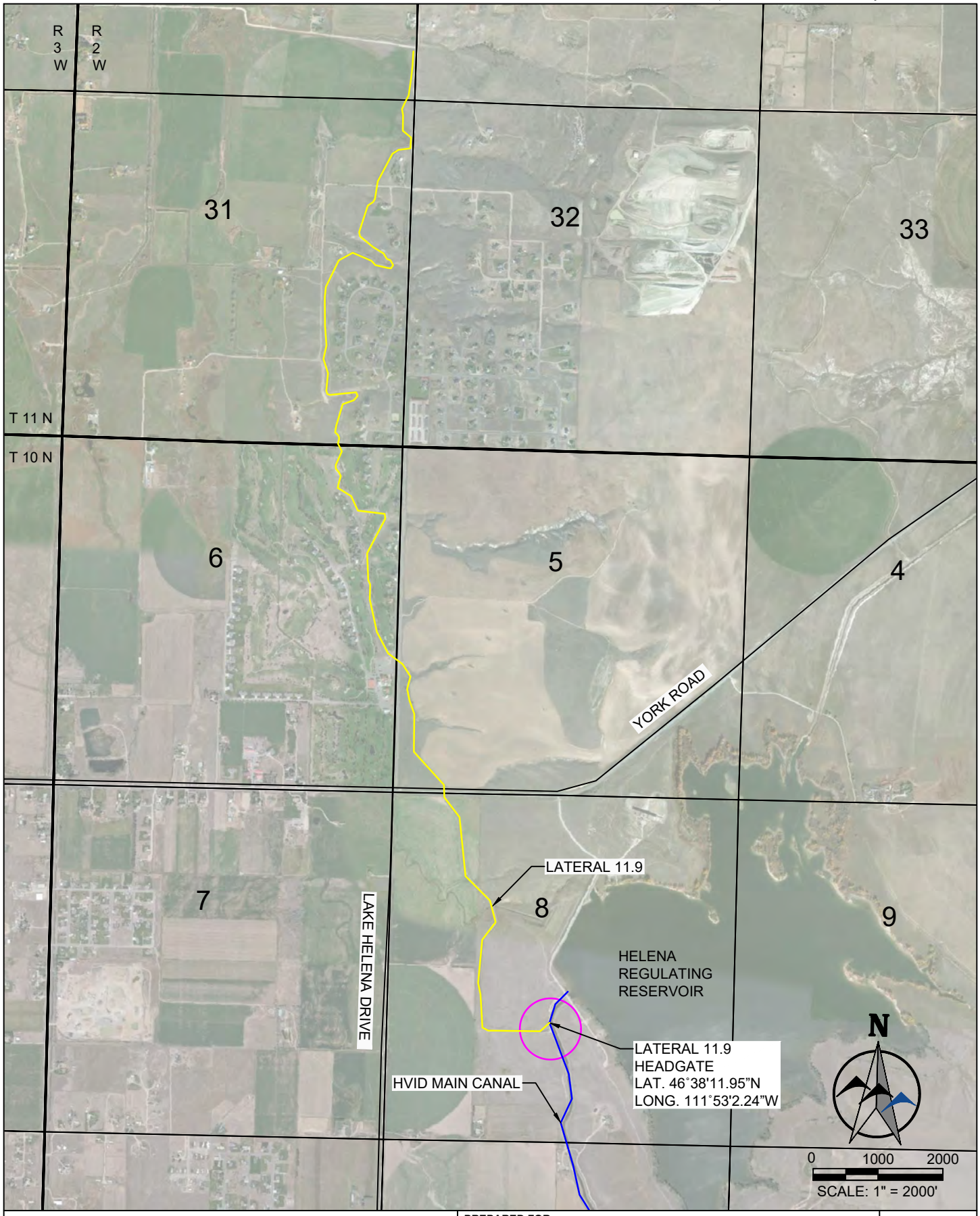


FIGURE 1. LOCATION MAP



LATERAL 11.9 CANAL CONVERSION AND GATE REHABILITATION

PROJECT MAP

LEWIS AND CLARK COUNTY, MONTANA

PREPARED FOR

HELENA VALLEY IRRIGATION DISTRICT

3840 N. Montana Ave.
Helena, MT 59602

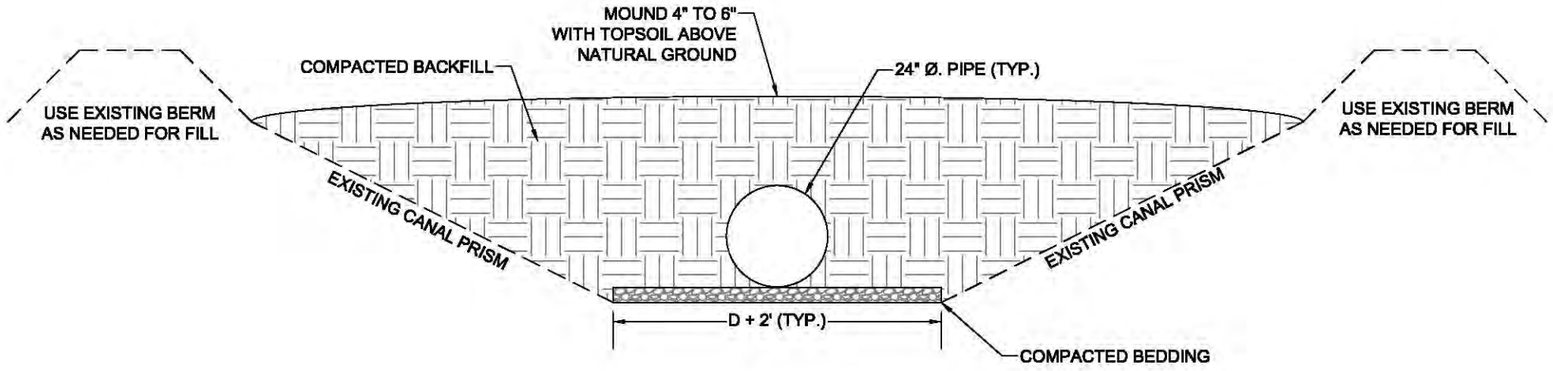
DESIGNED BY: GJ
DRAWN BY: MJS
CHECKED BY: STH
DATE: 4/6/20

PREPARED BY

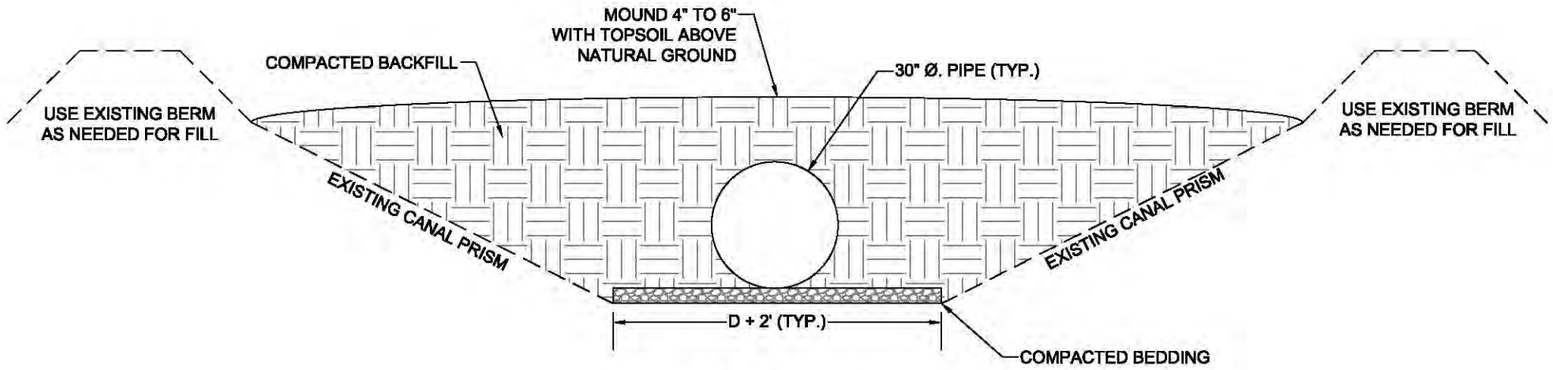
WWC ENGINEERING

1275 MAPLE STREET, SUITE F
HELENA, MT 59601
(406) 443-3962
www.wwcengineering.com

EXHIBIT
1



24" PIPE TYPICAL
NOT TO SCALE



30" PIPE TYPICAL
NOT TO SCALE

CANAL CONVERSION	
ALTERNATIVE NO.	*PIPE MATERIAL*
1	N/A
2	PVC
3	REINFORCED CONCRETE PIPE (RCP)
4	HDPE PIPE
5	PLASTIC IRRIGATION PIPE (PIP)

NOTES:
1. 24" PIPE - 9,550LF
2. 30" PIPE - 8,000LF
3. PIPE LENGTHS ARE FOR PRELIMINARY PURPOSES ONLY. CONTRACTED ENGINEER TO WORK WITH HVID TO DETERMINE FINAL DESIGN LENGTHS.

PRELIMINARY

NO.	REVISION	BY	DATE

PREPARED BY
WWC ENGINEERING
1275 MAPLE STREET, SUITE F
HELENA, MT 59601
(406) 443-3962
www.wwcengineering.com

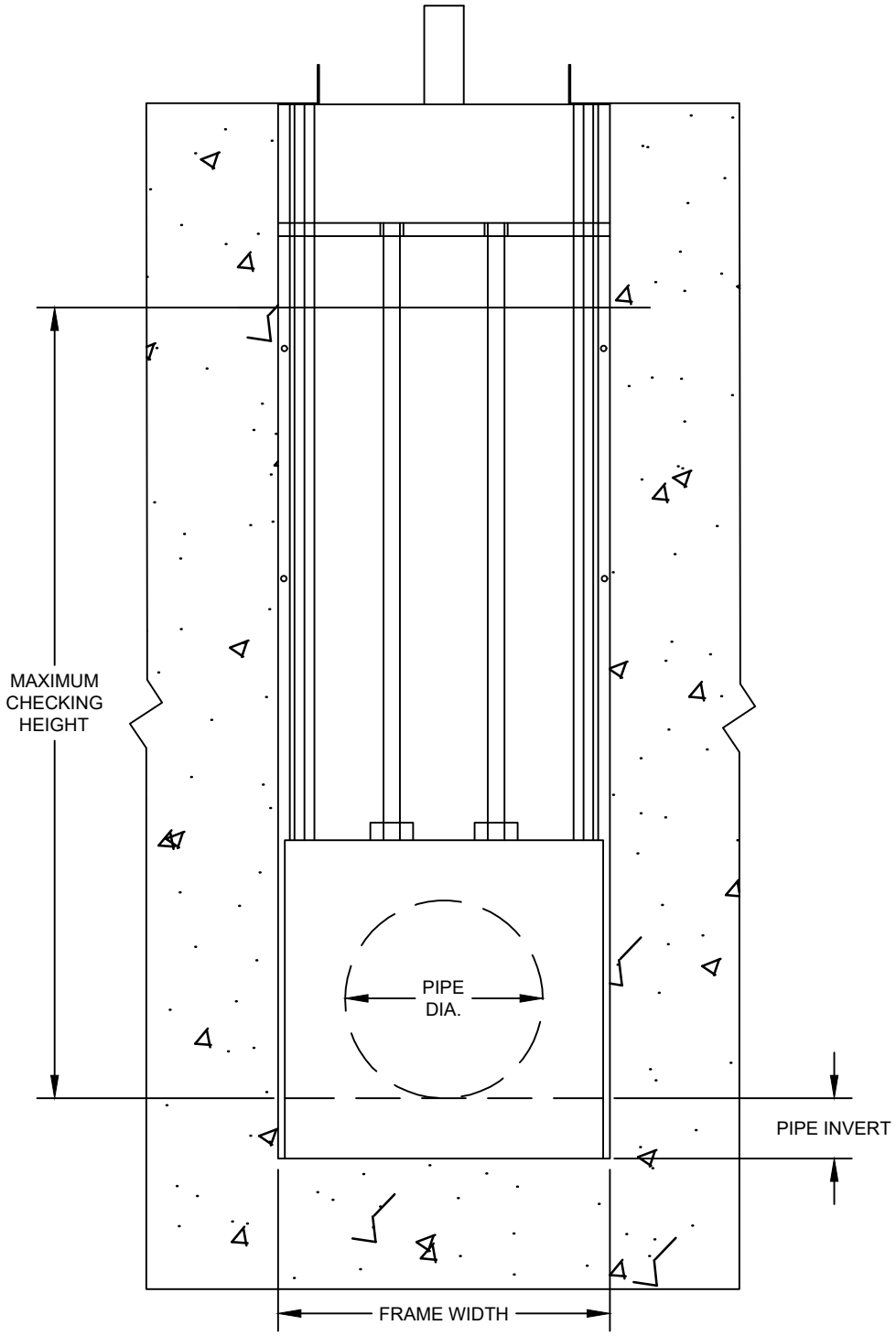
HELENA VALLEY IRRIGATION DISTRICT
LATERAL 11.9 CANAL CONVERSION AND GATE REHABILITATION

CANAL CONVERSION ALTERNATIVES

LEWIS AND CLARK COUNTY, MONTANA

DESIGNED BY: GJ
DRAWN BY: MJS
CHECKED BY: STH
DATE: 4/6/20

EXHIBIT
2



ALTERNATIVE C - RUBICON SLIPGATE WITH SCADA SYSTEM

NOT TO SCALE

LATERAL 11.9 CANAL CONVERSION AND GATE REHABILITATION

ALTERNATIVE C

LEWIS AND CLARK COUNTY, MONTANA

PREPARED FOR

HELENA VALLEY IRRIGATION DISTRICT

3840 N. Montana Ave.
Helena, MT 59602

DESIGNED BY: GJ
DRAWN BY: MJS
CHECKED BY: STH
DATE: 4/6/20

PREPARED BY

WWC ENGINEERING
1275 MAPLE STREET, SUITE F
HELENA, MT 59601
(406) 443-3962
www.wwcengineering.com

EXHIBIT

4

APPENDIX A
WATER MEASUREMENTS

HVID FLOW RECORDS

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **May** **2018**

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1						0	0	0	2	2	0	0	0	0	0	0	0	2	1	0	0	3	3	0	0	0		30	10	20			1
2						0	0	0	2	2	0	0	0	0	0	0	0	2	1	0	0	3	3	0	0	0		30	10	20			2
3						0			2	2		0	0	1				2	1		0	3	3			0		30	10	20			3
4						1			2	2								2	1		0	3	3			0		30	10	15			4
5									2	2								2	1		0	3	3			0		30	10	15			5
6									2	2								2	1		0	3	3			0		30	10	15			6
7									2	2								2	1		0	3	3			0		35	10	15			7
8									2	2								2	1		10	3	3			0		35	10	15			8
9									3	2								2	1		10	3	3			0		32	10	15			9
10									3	2								2	1		10	3	3			1	1	32	10	15			10
11									2	2								2	1		5	1	3			1	1	32	10	15			11
12									2	2								2	1		4		3			1	1	32	10	10			12
13									2	2								2	1		4	1	3			1	1	32	10	10			13
14									2	2								2	1		4	1	3			1	1	32	10	10			14
15									2	2								2	1		4	1	3			1	1	32	10	10			15
16									3	2								2	1		7	1	3			2	2	32	10	10			16
17									3	2								2	1		7	1	4			2	2	32	5	5			17
18									3	2								2	1		7	1	4			2	2	32	5	5			18
19									3	2								3	1		7	1	4			2	1	37	5	5			19
20									3	2								3	1		7	1	4			2	1	37	5	5			20
21									3	2								3	1	0	3	1	4			2	1	35	2	5			21
22									3	2								3	1	0	3	1	4			2	1	40	3	5			22
23									3	2								3	1	1	4	1	6			2	1	45	3	3			23
24						0			3	2								3	1	1	6	1	7			2	1	57	0	1			24
25						0			3	2						0		3	1	1	14	1	9			2	1	64	0	1			25
26						0			3	2	0					0		3	1	1	14	1	9			2	1	70	0	1			26
27						4			3	2	0					0		3	1	1	14	1	9			2	1	70	0	0			27
28						4			4	2	1		0			0		3	1	2	14	1	9			2	1	75	0	0			28
29						4			4	2	1	0	1			3	0	3	1	2	17	1	9			3	1	80	0	0			29
30						0			4	2	1	0	1	0	0	3	0	3	1	2	17	1	11	2	0	3	1	90	0	0			30
31						0			4	2	1	0	1	0	0	3	0	3	1	2	9	1	11	0	0	3	1	90	0	3			31
CFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	CFS
Acre/FT	0	0	0	0	0	0	0	0	160	124	0	0	0	0	0	0	0	190	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Acre/FT

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **June** 2018

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
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2						0			4	2	1	0	0	0	0	3	0	3	1	0	5	2	11	0		3	0	40	8	10			2
3						0			4	2	1/4	0	0	0	0	3	0	3	1	0	5	2	11			3	0	40	8	10			3
4						0			1	2	1/4	0	10	0	0	0	0	5	1	0	10	3	11	0	0	3	0	40	10	10	0	0	4
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6						0			12	2	1/4	0	10	0	0	0	0	5	0	1	15	1	11			3	0	40	10	10			6
7						0			6	2	1/4	0	10	0	0	0	0	5	0	1	18	1	11			3	0	40	0	0			7
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10						0			2	2	1/4	0	2	1	0	3	3	5	0	1	18	1	11			3	0	45	10	10			10
11						0			6	2	1/4	0	0	1	0	3	3	1	0	1	18	1	3			3	0	57	0	0			11
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16						0	1		3	2	1/4	0	0	1	3	0	0	3	0	1	7	1	10			3	0	30	10	15			16
17						0	0		3	2	0	1/2	0	1	0	3	0	3	1	1	7	1	10			3	0	30	10	15			17
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19						0			3	2	1	1/2	0	0	0	0	1	3	1	0	4	1	3	1	0	2	1	30	10	10			19
20						1			3	2	1	0	1	1	1	1	1	3	1	1	4	1	3	1	1	2	1	30	10	10			20
21						1			3	0	1	1	1	1	1	1	1	3	1	1	4	1	3	1	1	2	1	30	10	10			21
22						1			3	0	1	1	1	1	1	1	1	3	1	1	4	1	3	1	1	2	1	30	10	10			22
23						1			3	0	1	1	1	1	1	1	1	3	1	1	4	1	3	1	1	2	1	30	10	10			23
24						1			3	0	1	1	1	1	1	1	1	3	1	1	4	1	3	1	1	2	1	30	10	10			24
25						1			3	0	1	1	1	1	1	1	1	3	1	1	4	1	3	1	1	2	1	30	10	10			25
26						1			3	0	1	1	1	1	1	1	1	3	1	1	5	1	3	1	1	2	1	30	10	10			26
27						1	0		3	0	1	1	1	1	1	1	1	3	1	1	5	1	3	1	1	2	1	30	10	10			27
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29						3	0		3	0	1	1	1	1	1	1	1	3	1	1	7	2	3	1	1	2	1	30	10	10			29
30						0	0		3	0	0	0	0	0	0	0	0	3	1	0	7	2	3	0	0	2	1	30	10	10	0	0	30
31																																
CFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Acre/FT	0.0	0.0	0.0	0.0	0.0	6x 0.0	3x 0.0	0.0	148x 0.0	0.0	6.5x 0.0	1.5 0.0	54x 0.0	9x 0.0	15x 0.0	30 0.0	18 0.0	96 0.0	19 0.0	13 0.0	257 0.0	39 0.0	199 0.0	0.0	0.0	78 0.0	13 0.0	1168 0.0	302 0.0	221 0.0			

12 6 0 296 13 3 108 18 30 60 36 192 38 26 514 78 398 0 0 156 26 2336 4

X2

774
1852

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B		
1						0	0	0	3	0	0	0	0	0	0	0	0	3	1	0	5	3	3	0	0	2	1	30	10	5		1
2						0	0	0	3	0	0		0	0			0	3	1	0	7	3	3	0	0	2	1	30	10	5	0		2
3						0	0	0	3	0	0	0	0	0	0	0	½	3	1	0	7	3	3	0	0	2	1	30	7	5	0		3
4						0	0	0	3	0	0		0	0			½	3	1	0	7	3	3	0	0	2	1	30	5	5	0	0	4
5						0	0	0	3	0	0		0	0			½	3	1	0	9	3	3	0	0	2	1	30	5	5	0	0	5
6						0	0	0	3	0	0	0	0	0	0	0	1	3	1	0	19	2	10	0	0	2	1	35	7	5	0	0	6
7						0	0	0	3	0	0		0	0			1	3	1	0	19	2	13	0	0	2	1	35	3	3	0	0	7
8						0	0	0	3	0	0		0	0			0	3	1	0	19	2	13	0	0	2	1	35	3	5	0	0	8
9						0	0	0	3	0	0		0	0			0	4	1	0	20	2	13	0	0	2	1	35	3	5	0	0	9
10						0	0	0	3	0	0		1	0			0	4	1	0	23	2	13	0	0	2	0	45	5	5	7	7	10
11						0	0	0	3	0	0		1	0			0	4	1	0	23	2	13	2	0	5	0	60	5	0	7	7	11
12						0	0	0	3	0	0		1	0			0	4	1	0	23	2	13	2	0	6	0	65	5	0	7	7	12
13						0	0	0	3	0	0		1	0			0	4	1	0	21	2	13	2	0	7	0	70	1	0	7	7	13
14						0	0	0	3	0	½		1	0			0	4	1	1	21	1	13	2	0	9	0	70	1	0	7	7	14
15						0	0	0	3	0	½		1	0			0	4	1	1	20	1	13	2	0	10	0	80	1	0	7	7	15
16						0	0	0	3	0	½		1	0			0	4	1	1	20	1	13	2	0	10	0	80	1	0	11	7	16
17						0	0	0	5	2	½		1	1			0	4	1	1	22	1	13	2	0	10	0	80	1	3	11	7	17
18						0	0	0	5	2	½		1	1		3	0	4	1	1	22	1	13	2	0	10	0	80	1	3	11	4	18
19						0	0	0	5	2	½		0	1	0	3	0	4	1	2	22	1	13	2	0	10	0	90	1	3	11	4	19
20						0	0	0	10	2	½	0	0	1	0	3	0	4	0	2	20	1	13	2	0	8	0	90	1	1	11	4	20
21						0	0	0	12	2	½		3	2		3	0	4	0	2	20	1	13	2	0	8	0	90	1	1	11	4	21
22						0	0	0	12	2	½		3	3		3	0	4	0	2	20	1	13	2	0	8	0	90	1	1	11	4	22
23						0	0	0	12	2	½		3	3		3	0	4	0	1	17	2	5	2	0	8	0	82	2	0	11	5	23
24						0	0	0	12	2	½		4	3		3	0	4	0	1	14	2	11	2	0	8	0	82	0	5	11	5	24
25						2	0	0	12	2	½		4	3		3	0	4	0	1	14	1	11	2	0	9	0	82	0	4	11	5	25
26						2	0	0	12	2	½		4	3		3	0	4	0	1	13	1	11	2	0	11	0	75	4	4	5	5	26
27						4	0	2	12	2	½		4	3		3	0	4	0	1	16	1	11	2	0	11	0	75	0	0	11	5	27
28						4	0	2	12	2	½		4	3		3	3	4	0	1	16	1	11	2	0	11	0	75	0	0	11	5	28
29						4	0	2	12	2	½		4	2		3	3	4	0	1	16	1	11	2	0	11	0	75	0	3	11	5	29
30						4	0	2	12	2	½		4	2		3	3	4	1	1	13	1	11	2	0	11	0	75	0	3	11	5	30
31						2	0	0	12	2	½	0	4	2	0	3	3	3	1	1	16	1	11	2	0	11	0	85	0	4	11	5	31
CFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	CFS
						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Acre/FT

1058

9 1984 84 85 212 121

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **August** **2018**

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1						2	0	0	12	2	½	0	4	2	0	3	3	3	1	1	14	1	11	3	0	11	0	88	1	1	11	5	1
2						2	0	0	12	2	½	0	4	2	0	3	3	3	1	1	14	1	11	3	0	11,5	0	75	0	0	11	5	2
3						1	0	0	12	2	½	0	4	2	0	3	3	3	1	1	15	1	13	3	0	11,5	0	75	0	1	11	5	3
4						7	0	0	12	2	½	0	4	2	0	3	3	2	0	1	15	1	13	3	0	11,5	0	75	0	1	13,5	5	4
5						7	0	0	12	2	½	0	4	2	0	3	3	2	0	1	15	1	13	3	0	11,5	0	75	0	1	13,5	5	5
6						7	0	0	12	2	½	0	4	2	0	3	0	2	0	1	14	1	9	3	0	8,5	0	85	0	2	13,5	5	6
7						7	0	0	9	2	½	0	4	2	0	3	0	3	0	1	17	1	9+3	3	0	8,5	0	85	0	0	13,5	5	7
8						7	0	0	9	2	½	0	0	2	0	3	0	3	0	1	17	1	9+3	3	0	8,5	0	85	2	0	13,5	5	8
9						3	0	0	9	2	½	0	0	2	0	3	0	5	0	1	17	1	9+3	3	0	8,5	0	85	2	4	13,5	5	9
10						3	0	0	9	2	½	0	4	2	0	3	0	5	0	1	17	1	9+3	3	0	8,5	0	85	0	0	13,5	5	10
11						3	0	0	9	2	½	0	4	2	0	3	0	5	0	2	17	1	9+3	3	0	8,5	0	85	0	0	13,5	5	11
12						3	0	0	9	2	½	0	4	2	0	3	0	5	0	2	17	1	9+3	3	0	8,5	0	85	0	0	13,5	5	12
13						3	0	0	9	2	½	0	4	2	0	3	0	5	0	2	17	1	9+3	3	0	8,5	0	75	0	0	13,5	5	13
14						3	0	0	9	2	½	0	4	2	0	3	0	5	0	2	17	1	9+3	3	0	8,5	0	75	1	4	13,5	5	14
15						3	0	0	9	2	½	0	4	2	0	3	0	5	0	2	17	1	8+3	3	0	8,5	0	75	1	4	11	5	15
16						0	0	0	9	0	½	0	0	2	0	3	0	5	1	1	17	1	5+3	3	0	8,5	0	70	1	4	11	5	16
17						0	0	0	5	0	½	0	0	2	0	3	0	5	1	1	19	1	5+3	3	0	8,5	0	60	2	0	14	5	17
18						0	0	0	5	0	0	0	0	2	0	0	0	2	1	1	20	1	5+3	3	0	3	1	55	2	0	14	5	18
19						0	0	0	5	0	0	0	0	2	0	0	0	2	1	1	20	1	5+3	3	0	3	1	55	2	0	14	5	19
20						0	0	0	5	0	0	0	0	2	0	0	0	2	1	0	19	1	5+3	3	0	3	1	45	0	5	14	5	20
21						0	0	0	5	0	0	0	0	2	0	0	0	2	1	0	10	1	3+2	3	0	2	0	27	0	5	14	5	21
22						0	0	0	5	0	0	0	0	2	0	0	0	1	1	0	10	1	1+2	3	0	2	0	27	3	5	14	5	22
23						0	0	0	5	0	0	0	0	2	0	0	0	1	0	0	10	1	2	3	0	2	0	27	3	5	14	5	23
24						0	0	0	5	0	0	0	0	2	0	0	0	1	0	0	13	1	2	3	0	2	0	27	3	5	14	5	24
25						0	0	0	5	0	0	0	0	2	0	0	0	1	0	0	13	2	2	3	0	2	0	25	3	5	14	5	25
26						0	0	0	5	0	0	0	0	2	0	0	0	1	0	0	13	2	2	3	0	2	0	25	3	5	14	5	26
27						0	0	0	2	0	0	0	0	2	0	0	0	1	0	0	7	2	2	3	0	2	0	24	3	6	9	5	27
28						0	0	0	2	0	0	0	0	2	0	0	0	1	0	0	5	2	2	3	0	2	0	24	3	6	9	5	28
29						0	0	0	2	0	0	0	0	2	0	0	0	1	0	0	5	2	2	3	0	2	0	24	3	6	9	5	29
30						0	0	0	2	0	0	0	0	2	0	0	0	1	0	0	5	2	2	3	0	2	0	27	2	6	9	5	30
31						0	0	0	2	0	0	0	0	2	0	0	0	1	0	0	5	2	2	3	0	3	0	27	6	6	0	5	31
CFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	CFS
AF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Acre/FT
						61	0	0	222	30	8,5	0	48	2	0	51	15	84	10	24	431	38	243	93	0	32	3	1777	45	85	379	155	
																						76	486	186		64	6	3554	90	170	759	310	

XER 6pm 20, S 62, 22LT
MOD 4 2pm
7.16

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **September** 2018

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1						10	0	0	2	0	0	0	0	2	0	0	0	1	0	0	5	2	2	3	0	3	0	27	6	6	0	5	1
2						0			2	0			0	2	0	0	0	1	0	0	5	2	2	3	0	3		27	6	6	0	5	2
3						0			2	0			0	2		0	0	1	0	0	5	1	2	3	0	3		27	6	6	0	5	3
4						0			2	0			0	2		0	0	1	0	0	7	1	2	3		3		27	6	10	0	5	4
5						0			2	0			0	0		0	0	1	0	0	5	1	2	3		3		27	6	10	0	5	5
6						0			2	0			0	0		0	0	5	0	0	7	1	2	3		3		27	6	10	0	5	6
7						0			2	0			0	0		0	0	5	0	0	10	1	2	3		3		50	6	10	0	5	7
8						0			3	0			0	½		3	0	5	0	0	13	1	2	3		8		50	6	10	0	5	8
9						0			11	0			1	½		3	0	5	0	0	13	1	2	3		8	0	50	6	10	0	5	9
10						0			11	0			1	½		3	0	5	0	0	13	1	2	3		8	0	50	6	10	0	5	10
11						0			11	3	0		1	½		3	0	5	0	1	5	1	2	3		8	0	60	4	0	6	5	11
12						0			4	3			0	½		3	0	5	0	0	5	1	2	3		12		60	0	0	10	5	12
13						0	0	0	4	3	0	0	0	½	0	3	0	5	1	0	5	1	2	3	0	12	0	63	2	0	10	5	13
14						0			5	3			0	0		3	0	5	1	0	4	1	2	3		12		63	5	5	10	2	14
15						0			5	3			0	0		3	0	5	1	0	4	1	10.5	3		9		60	5	5	10	2	15
16						0			5	3			0	0		3	0	5	1	0	4	1	10.5	3		9		60	5	5	10	2	16
17						0			5	3			0	0		3	3	5	1	0	6	1	9.5	3		9		40	5	5	4	0	17
18						0			5	3			0	0		3	3	5	1	0	4	1	9.5	3		5		32	8	5	4	0	18
19						0			5	0			0	0		3	3	5	1	0	4	1	9.5	3		5		32	8	8	0	0	19
20						0			3	0	0	0	0	0	0	3	3	5	1	0	3	1	9.5	3		5	0	22	8	8	0	0	20
21						0			3	0			0	0		3	3	5	1	0	3	1	9.5	3		5		22	8	10	0	0	21
22						0			3	0			0	0		3	3	2	1	0	3	1	9.5	0		5		22	8	10	0	0	22
23						0			3	0			0	0		3	3	2	1	0	3	1	2	0		5		22	8	10	0	0	23
24						0			3	0	0		0	0		3	3	2	1	0	3	1	2	0		5	0	22	8	10	5	0	24
25						0			3	0			0	0		3	3	2	1	0	3	1	2	0		5		22	8	10	5	0	25
26						0			3	0			0	0		0	0	2	1	0	3	1	2	0		1½		22	8	10	0	0	26
27						3	0	0	3	0	0		0	0		0	0	2	1	0	3	1	2	0	0	1½	0	22	8	10	0	0	27
28						3			3	0			0	0		0	0	2	1	0	3	1	2	0		1½		22	8	10	0	0	28
29						3			3	0			0	0		0	0	2	1	0	3	1	2	0		1½		22	8	10	0	0	29
30						3			3	0			0	0		0	0	2	1	0	3	1	2	0		1½		22	8	10	0	0	30
31						3			3	0			0	0		0	0	2	1	0	3	1	2	0		1½		22	8	10	0	0	31
CFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	CFS
Acre/FT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Acre/FT

30 248 42 6 22 108 54 210 38 8 272 66 248 124 340 1096 198 239 208 142
2192 396 478

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **May** **2019**

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20	0	0	1
2									0	0	0							0	0	0	0	0	0				0	20	8	7			2
3									0	0	0							0	0	0	0	0	0				0	20	8	7			3
4									0	0	0							0	0	0	10	4	0				0	20	8	7			4
5									3	0	0							0	0	0	10	4	0				0	20	8	7			5
6									3	0	0							0	0	0	10	4	0				0	20	8	7			6
7									3	0	0							0	0	0	10	4	0				0	20	8	7			7
8									3	0	0							0	0	0	10	4	0				0	20	8	7			8
9									3	0	0							0	0	0	10	4	0				0	20	8	7			9
10	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	3	0	11.5	5	3	0	0	0	0	20	8	7	0	0	10
11									3	0	0							3	1	0	15	1	3				0	20	8	7			11
12									3	0	0							3	1	0	15	1	3				0	20	8	7			12
13									3	0	0							3	1	0	15	4	3			3	0	20	8	7			13
14									3	0	0							5	2	1	11	4	5			3	0	20	8	7			14
15									3	2	0							5	2	1	11	4	5			3	0	20	8	2			15
16									3	2	0							5	2	1	11	4	5			3	0	20	8	2			16
17						0			3	2	0	0	0	0	0	0	0	5	2	1	8	3	5	0	0	3	1	24	8	2	0	0	17
18									3	2	0							5	1	1	8	3	5			3	1	24	8	2			18
19									3	2	0							5	1	1	8	3	5			3	1	24	8	2			19
20									3	2	0							2	1	1	5	2	5			3	1	24	8	8			20
21									3	2	0							2	1	1	5	2	5			3	1	24	8	8			21
22									3	2	0							2	1	1	5	2	5			3	1	24	8	8			22
23									3	2	0							2	1	1	7.5	1	5			3	1	32	8	5	0	0	23
24						1			3	2	1/2							2	1	1	14	1	5			3	1	37	5	2			24
25						1 1/2			3	2	1/2							2	1	1	14	1	5			3	1	37	5	2			25
26						1 1/2			3	2	1/2							2	1	1	8.5	1	5			3	1	37	5	2			26
27						1 1/2			3	2	1/2							2	1	1	8.5	2	5			3	1	37	5	7			27
28						1 1/2			3	2	1/2							2	1	1	6	2	5			3	1	30	5	7			28
29						0			3	2	1/2							2	1	1	6	0	5			3	1	30	6	7			29
30						0			3	2	1/2							2	1	1	9	0	7.5			3	1	30	6	7			30
31	0					0			3	2	1/2							2	1	1	9	0	7.5			3	1	30	6	7			31
CFS	0	0	0	0	0	0	0	0	40	40	40	0	0	0	0	0	0	60	18/	90	210	X	0	0	0	0	0	0	0	0	0	0	
Acre/FT	0	0	0	0	0	0	0	0	160	80	80	0	0	0	0	0	0	150	50	25	540		0	0	0	0	0	0	0	0	0	0	

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month June 2019

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1						0	0	0	6	0	1		1	0	0	3	0	6	0	1	14	1	7	0	0	8	0	45	1	2	10		1
2							0	0	6	0	1		1	0		3		6	0	1	14	1	7		0	8	0	45	1	2	10		2
3							0	0	6	0	1		1	0		3		6	0	1	18	1	7			8	0	45	1	2	10	0	3
4							0	0	7	2	1		1	0		3		6	0	1	18	1	14			8		55	1	0	4		4
5							0	0	16	2	1		8	0		3		6	0	1	15	0	17			10		65	1	0	14		5
6						0	0	0	18	2	1		8	0		3		6	0	1	12	0	18			12		80	0	0	16	0	6
7							0	0	13	2	1		8	0		0		9	1	1	15	1	21			13		86	0	0	14	0	7
8						0	0	0	11	2	1	0	8	0	0	0	0	7	1	1	10	1	23			15.5		90	0	0	0		8
9							0	0	11	0	1		2	0		0		7	1	1	10	0	23			15.5		90	0	0	0		9
10						0	0	0	9	0	1		2	0	0	0	0	9	1	1	10	0	23			15.5		80	2	0	0	0	10
11							0	0	11	0	1		1	0		0		6	1	1	19	1	23			15.5		80	0	0	5		11
12							0	0	11	0	1		1	0		0		5	1	1	20	1	23			15.5	0	85	0	0	5		12
13							0	0	11	0	1		1	0		0		5	1	1	20	1	23			15.5	0	85	0	0	5		13
14							0	0	11	0	1		1	0		0		5	1	1	20	1	23			15.5		90	0	0	5		14
15							1	0	11	0	1		1	2		0		5	1	2	20	1	23			15.5		95	0	0	5		15
16							1	3	11	2	1		1	2		0	3	5	1	2	12	1	23	0		15.5		95	0	0	5	0	16
17						0	1	3	14	2	1		1	2		0	3	4	1	2	12	1	20	2		15.5		75	0	0	0		17
18						0	1	2	14	2	1	0	1	2	0	2	3	4	1	2	12	1	17	2		15.5		45	0	0	0		18
19							1	0	14	2	1		0	2		3	2	4	1	2	8	1	14	2	0	15.5		37	3	0	0	0	19
20						0	1	0	12	2	1	0	0	2	0	3	2	6	1		7	0	13	2	0	15.5	0	37	2	0	0	0	20
21							1	0	3	2	1		0	2		3	0	6	1	1	7	0	12	2		13.5		53	2	0	0		21
22							1	0	4	2	1		0	2		3	0	3	1	1	7	0	12	2		13.5		53	2	0	0		22
23							1	0	4	2	1		0	2		3	0	3	1	1	7	0	12	2		13.5		53	2	0	0		23
24							1	0	4	2	1		0	2		3	0	3	1	1	6	0	1	2		7		57	2	0	0		24
25						0	1	0	6	0	1	0	0	2	0	3	0	3	1	1	6	0	1	2	0	6		60	4	0	0	0	25
26							1	0	6	0	1		0	2		3	0	3	1	1	4	0	1	2		6		60	4	0	0		26
27							1	0	6	0	1		0	2		3	0	3	1	1	3	0	1	2		6		60	4	0	0		27
28						0	1	0	1	0	1/2		0	2		3	0	3	1	1	3	0	4	2	0	6		60	4	0	0		28
29							1	0	1	0	1/2		0	2		3	0	2	1	1	3	0	4	2		6		60	4	0	0		29
30							1	0	1	0	1/2	0	0	2	0	0	0	2	1	1	3	0	4	2	1	6		60	4	0	0		30
31						0	1	0						0				4			4		8		0		0	42	4	10	0	0	31
CFS	0	0	0	0	0	0	1/0	9/0	359/0	70/0	385/0	0	19/0	32/0	0	50/0	13/0	156	0	35/0	339/0	0	0	0	0	0	0	0	0	0	0	0	CFS
Acre/FT	0	0	0	0	0	0	0		0			0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	Acre/FT

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **July** **2019**

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1						0	1	0	1	0	1/2	0	0	0	0	0	0	4	1	1	4	0	8	2	0	6	0	42	4	10	0	0	1
2						0	1		3	0	0			0				4	1	0	9	0	8	2	0	6	0	30	4	5	12	5	2
3						0	0		3	0	0							4	1	0	9	0	8	2		7	0	30	4	5	12	5	3
4						0	0		3	0	0							4	1	0	9	0	8	2		9		30	4	5	12	5	4
5						0	0		3	0	0							4	1	0	11	0	4	4		8	0	30	4	10	12	5	5
6						0	0		3	0	0							4	1	0	11	0	8	4		8		30	4	10	12	5	6
7						0	0		3	0	0							4	1	0	11	0	8	4		8		30	4	10	12	5	7
8						0	0	0	3	0	0	0	0	0	0	0	0	4	2	0	10	0	8	4	0	5	0	30	4	10	12	5	8
9						0	0		3	0	0							2	0	0	8	0	8	2		5		30	4	10	12	5	9
10						0			3	0	0							2	1	0	8	0	3	2	0	5	0	30	4	10	12	5	10
11						0	0	0	7	0	0	0	0	0	0	0	0	2	1	0	9	0	3	2		5		30	4	10	12	5	11
12						0	0		7	0	0							2	1	0	10	0	4	0		5		30	4	10	12	5	12
13						0	0		7	0	0							6	1	0	13	2	4	0		5		30	4	10	12	5	13
14						0	0		7	2	0							6	1	0	11	0	4	0		5	0	30	4	10	12	5	14
15						0	0		7	2	0							6	1	1	14	0	8	0		5		30	0	10	12	5	15
16						0	0		7	2	0							7	1	1	17	0	8	1		5		30	0	10	12	5	16
17						0	0	0	9	2	0	0	0	0	0	0	0	6	1	1	19	0	8	3	0	5	0	37	2	10	12	5	17
18						0	0	0	9	2	1/2	0	0	0	0	0	0	6	1	1	19	0	7	3	0	5	0	37	5	10	12	5	18
19						0	0		3	2	1							6	1	1	21	0	4	3		3		53	2	3	12	5	19
20						0	0		3	2	1							6	1	1	21	0	4	3		5		53	2	3	12	5	20
21						0	0		7	2	1							6	1	1	21	1/4	4	3		6		56	2	3	12	5	21
22						2	0		7	2	1							6	1	1	21	0	4	3		6		56	2	3	12	5	22
23						2	0		14	2	1		0					6	1	1	21	1/2	4	3		7		63	2	3	16	5	23
24						2	0		14	2	1/2		8			0	0	6	1	1	19	0	4	3		7		63	2	3	16	5	24
25						2	1		17	2	1		8			3	1/2	6	1	1	19	0	7	3		7		66	0	0	16	5	25
26						2	1		17	2	1		8			3	1/2	6	1	2	17	0	7	3		5		70	0	0	16	5	26
27						2	1		8	2	1		1	0	0	3	1/2	6	1	2	17	1/4	7	3		5		70	0	0	16	5	27
28						2	1		8	2	1		1			3	1/2	8	1	2	17	0	7	2		5		70	0	0	16	5	28
29						2	1		8	2	1		1	0		3	0	8	1	2	17	0	7	2		5		70	0	0	16	5	29
30						2	1	0	8	2	1		0	2		3	0	8	1	2	17	0	7	2		5		65	0	0	12	4	30
31						2	1		8	2	1	0	0	2	0	3	0	8	2	1	17	1/4	8	2	0	5	0	66	0	0	12	4	31
						0	0	0	30	30	13 5	0	7 0	4 0	0	20	20	163	10	23	447	10	0	0	0	0	0	0	0	0	0		
											0		59	98	0	142	44	324	0	46	894	0										

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **August** **2019**

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1						2	1	0	9	2	1	0	0	2	0	3	0	5	1	1	16	1/2	8	2	0	5	0	57	0	0	12	4	1
2						2	1	0	9	2	1	0	0	2	0	3	0	5	1	1	16	1/4	8	2	0	5	0	57	0	0	12	4	2
3						2	1	0	9	2	1	0	0	2	0	3	0	5	1	1	15	1/4	8	2	0	6	0	57	0	0	12	4	3
4						2	1	0	9	2	1	0	0	2	0	3	1	5	1	1	15	1/4	9	2	0	6	0	57	0	0	12	4	4
5						7	1	0	9	2	1	0	0	2	0	3	1	6	1	1	14	1/4	8	2	0	7.5	0	57	0	0	12	4	5
6						3	1	0	7	2	1	0	1	2	0	3	1	6	1	1	12.5	1/4	9.5	2	0	7.5	0	57	0	0	12	4	6
7						8	1	0	9	2	1	0	1	2	0	3	1	6	1	1	8	0	9.5	2	0	10.5	0	61	0	0	12	4	7
8						8	1	0	9	2	1	0	1	2	0	3	1	8	1	1	9	0	9.5	2	0	10.5	0	61	0	2	12	4	8
9						8	1	0	9	2	1	0	0	2	0	3	0	8	1	1	9	0	11	2	1	10	1	48	0	0	8	4	9
10						8	1	0	9	2	1	0	0	2	0	3	0	8	1	1	9	0	11	2	1	8	1	48	0	0	8	4	10
11						8	0	0	9	2	1	0	0	2	0	3	0	8	1	1	9	0	11	2	1	8	1	53	0	0	8	4	11
12						3	0	0	9	2	1	0	0	2	0	3	0	5	1	1	2	4	5	2	1	4	1	53	3	8	8	4	12
13						3	0	0	8	0	1	0	0	2	0	3	3	4	1	1	2	1	5	2	1	4	1	53	3	8	8	4	13
14						3	0	0	8	0	1	0	0	2	0	3	3	5	1	1	1½	0	5	2	1	4	1	53	3	8	0	4	14
15						3	0	0	8	0	1	0	0	2	0	3	3	5	1	1	7	0	5	2	1	4	1	53	3	8	0	4	15
16						3	0	0	8	0	1	0	1	2	0	3	3	3	1	1	7	0	5	2	1	4	1	53	3	10	0	4	16
17						3	0	0	10	0	0	0	1	2	0	3	3	2	1	2	8	0	5	2	1	2½	1	53	5	10	0	4	17
18						3	0	0	10	0	0	0	1	2	0	3	3	2	1	2	8	0	5	2	1	2	1	53	5	10	0	4	18
19						3	0	0	6	0	0	0	1	2	0	3	3	5	1	2	11	1/4	6	2	1	2	1	53	5	10	4	4	19
20						3	0	0	8	0	0	0	1	2	0	3	3	5	1	2	12½	0	8	2	1	2	1	53	6	8	4	4	20
21						3	0	0	8	0	0	0	1	2	0	3	3	8	1	2	12½	1/4	8	2	1	2	1	53	6	8	5	4	21
22						3	0	0	8	0	0	0	1	0	0	3	3	8	1	2	10	1/2	8	2	1	2	1	53	6	8	5	4	22
23						2	0	3	4	0	0	0	1	0	0	3	3	6	1	2	7	1½	7	0	1	1	1	53	4	4	5	4	23
24						2	0	2	4	0	0	0	1	0	0	3	0	7	1	2	7	1	4	0	1	1	1	53	4	4	0	4	24
25						2	0	0	4	0	0	0	1	0	0	3	0	7	1	2	7	1	4	0	1	1	1	53	4	4	0	4	25
26						2	0	1	4	0	0	0	0	0	0	3	0	7	1	2	7	1	4	0	1	1	1	53	4	4	0	4	26
27						2	0	0	4	0	0	0	0	0	0	3	0	4	1	0	7	½	4	0	1	1	1	45	4	10	0	4	27
28						2	0	0	4	0	0	0	0	0	0	2	0	4	1	0	8	0	4	0	1	1	1	45	4	10	8	4	28
29						2	0	0	4	0	0	0	0	0	0	3	0	4	1	0	14	0	4	0	0	1	1	45	4	10	8	4	29
30						2	0	0	4	0	0	0	0	0	0	3	0	4	1	0	15	1	4	0	0	2½	1	45	4	10	8	4	30
31						2	0	0	4	0	0	0	0	0	0	3	0	4	1	0	15	0	4	0	0	2	0	45	4	4	8	4	31
CFS	0	0	0	0	0	113 0	10 0	9 0	224 0	29 0	14 0	0	13 0	42 0	0	93 0	38 0	169 0	10	34 0	30 0	0	0	0	0	0	0	0	0	0	0	0	CFS
				0	0	2284	20	18	448	18	37	0	28	84	0	188	76	309	0	68	682	0	0	0	0	0	0	0	0	0	0	0	

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **Sept** **2019**

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1						2	0	0	4	R	0	0	0	0	0	0	½	4	1	0	15	0	4	0	0	2	1	45	5	5	8	4	1
2						2			4	R			0			0	½	4	1	0	15	0	4	0	0	2	1	45	5	5	8	4	2
3						2			4	2	0	0	0	0	0	0	0	4	1	0	14	0	4	0	0	2	0	44	5	5	8	4	3
4						2			4	2			0			0		4	1	0	13	[illegible]	4	0		2	0	41	[illegible]	[illegible]	[illegible]	0	4
5						2			4	2			0			0		10	1	0	13	0	4	0		2	0	41	5	10	11	0	5
6						2			10	2			1			[illegible]		7	1	1	2	[illegible]	4	[illegible]		2	0	41	[illegible]	[illegible]	[illegible]	[illegible]	6
7						2	0	0	4	2	0	1	1	0	0	2	0	6	1	1	8	2	4	2	0	2	0	41	5	12	8	0	7
8						2			[illegible]	2		1	1			2		5	1	1	8		4	2		3	1	41	5	10	8	0	8
9						0			3	2		1	1			2		3	1	1	9	3	4	2		3	1	39	7	12	0	0	9
10						0			3	2		1	1			2		3	1	1	2	1	4	2		3	1	35	7	12	0	0	10
11						0			3	2		1	0			2		3	1	1	2	¼	4	2		3	1	35	7	12	0	0	11
12						0			3	2		1	0			2		3	1	1	2	0	4	2		3	1	35	7	12	0	0	12
13						0			3	2		1	1			2		3	1	1	2	0	4	0		3	1	35	7	12	0	0	13
14						0			3	2		1	1			2		3	1	1	2	0	4	0		3	1	30	7	12	0	0	14
15						0			3	0		1	1			2		3	1	1	2	0	4	0		3	1	30	7	12	0	0	15
16						0			3	0		1	1			2		3	1	1	2	0	4	0		3	1	30	7	12	0	0	16
17						0			3	0		1	1			2		3	1	1	2	0	0	0		3	1	26	7	7	0	0	17
18						0			3	0		1	1			2		3	1	1	2	0	0	0		3	1	26	7	10	0	0	18
19						0			3	0		1	1			2		3	1	1	2	0	0	0		3	1	26	7	10	0	0	19
20						0			3	0		1	1			2		3	1	1	5	0	0	0		3	1	26	7	10	0	0	20
21						0			3	0		1	1			2		3	1	1	5	0	0	0		3	1	26	7	10	0	0	21
22						0			3	0		1	1			2		2	1	1	5	0	0	0		3	1	26	7	10	0	0	22
23						0			3	0		1	1			2		2	1	1	5	0	0	0		3	1	26	7	10	0	0	23
24						0	0	0	3	0	0	0	0	0	0	0	0	2	1	0	4	0	0	0		1	1	26	7	8	0	0	24
25						0			3	0						0		2	1	0	4	0	0	0		1	1	26	7	8	0	0	25
26						0			3	0						0		2	1	0	4	0	0	0		1	1	26	7	8	0	0	26
27						0			3	0						0		2	1	0	4	0	0	0		1	1	26	7	8	0	0	27
28						0			3	0						0		2	1	0	4	0	0	0		1	1	26	7	8	0	0	28
29						0			3	0						0		0	1	0	1	0	0	0		1	1	26	7	8	0	0	29
30						0			3	0						0		0	1	0	1	0	0	0		1	1	26	7	8	0	0	30
31						0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	26	7	8	0	0	31
CFS	0	0	0	0	0	18	0	0	38	2[illegible]	0	0	5[illegible]	0	0	3[illegible]	1[illegible]	2[illegible]	1[illegible]	1[illegible]	1[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	CFS
Acre/FT	0	0	0	0	0	3[illegible]	0	0	76[illegible]	5[illegible]	0	0	10	0	0	7[illegible]	2[illegible]	50[illegible]	[illegible]	3[illegible]	39[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **April** **2020**

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1																																	1
2																																	2
3																																	3
4																																	4
5																																	5
6																																	6
7																																	7
8																																	8
9																																	9
10																																	10
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16																																	16
17																																	17
18																																	18
19																																	19
20																																	20
21																																	21
22																					2	0	3					15	0	15			22
23										2											2	0	3					15	0	15			23
24									4	2											2	0	3					15	0	15			24
25									4	2											2	0	3					15	0	15			25
26									4	2										1	2	0	3					15	0	15			26
27									4	2								4	1	1	2	0	3					15	0	12			27
28									4	2								4	1	1	12	0	3					15	0	15			28
29									5	2								4	1	1	12	1	3					23	0	15			29
30									5	2			0					4	1	1	15	1	3							10			30
31									5	2			7					4	1	0	15	1	3					30	0	10			31
CFS	0	0	0	0	0	0	0	0	35 0	16 0	0	0	7 0	0	0	0	0	20 0	5 0	5 0	16 0	3 0	3 0	0	0	0	0	18 0	0	13 0	0	0	CFS
Acre/FT	0	0	0	0	0	0	0	0	70 0	32 0	0	0	14	0	0	0	0	40	10	10	32 0	6	6 0	0	0	0	0	36	0	26 0	0	0	Acre/FT

202

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **May** **2020**

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1						0	0	0	5	2	0	0	7	0	0	0	0	4	1	0	12	2	3	0	0	0		30	2	10	0	0	1
2						0	0	0	5	2	1/4		7	0		0	0	4	1	0	12	2	3			0		30	2	4	0		2
3						0	0		5	2	1/4		3					4	1	0	12	2	3			0		30	2	4	0		3
4							0		5	2	1/4		3					4	1	0	9	2	3			0		30	4	2	0	0	4
5							0		9	2								3	1	0	8	1	3			0		45	6	2	0	0	5
6							0		10	2	1/4		3					3	1	1	7	0	3			0		45	6	2	0	0	6
7							0		10	2	1/4		0					3	1	1	8	0	3			0		51	6	5	0	0	7
8							1		10	2	1/4		0					1	1	1	8	0	3			0		66	0	0	0	0	8
9							1		10	2	1/4		0					1	1	1	10	0	3			0		66	0	0	0		9
10						0	1		8	2	1/2		0					1	1	1	10	0	3			0		64	0	0	0		10
11						2	1		8	2	1/2		0					1	1	1	10	0	3			2	1	66	0	0	0	0	11
12						3	1		8	2	1/2		3					2	1	1	7	1	3	0	0	2	1	66	3	3	0	0	12
13						3	1		8	2	1		2					2	1	2	8	1/4	4			2	1	71	0	0	0		13
14						3	1		8	2	1		2					2	1	2	14	1/4	4			2	1	71	2	2	0		14
15						3	1		8	2	1		2					2	1	2	15	2	4	0	0	2	1	71	2	2	0	0	15
16	1					3	0		8	2	1		2					2	1	2	15	0	4			4	0	71	2	2	0		16
17						3	0		8	2	1		2				0	2	1	2	15	0	4			4	0	71	5	5	0		17
18						3			8	2	1		2				1/2	2	1	2	19	0	4			5	0	71	4	0	0		18
19						3			8	2	1/2		0				1/2	2	1	2	19	4	4			5	0	71	4	2	0		19
20						3			8	0	1/2		0				1/2	2	1	2	11	4	4			5	0	71	2	2	0	0	20
21						3			5	0	1/2		0				0	2	1	2	10	2	3			5	0	66	0	5	3	0	21
22						3			3	0	1/2		0				0	2		2	13	0	3			5	0	52	0	5	3	0	22
23						3			3	0	1/2		0				0	2	1	2	13	1	3			5	0	52	0	0	3		23
24						3			3	0	1/2		0				0	2	1	1	13	1	3			5	0	52	0	0	3		24
25						3			3	0	1/2		0			0	0	2	1	1	13	1	3			5	0	52	0	0	3		25
26						3			4	2	1/2		1			0	0	5	1	1	15	0	3			5	1	52	5	5	3	0	26
27						3			4	2	1/2		1			3	0	6	1	1	16	0	3			5	1	57	7	3	3	0	27
28						3			5	2	1/2		1			3	0	6	1		14	0	3	0	0	5	1	57	2	5	3	0	28
29						3			5	2	1/2		1			3	0	8	1	1	16	0	5			7	1	65	3	5	3		29
30						3	0	0	5	2	0		1	0		3	0	9	1		16		6	0		8	1	65	2	5	3		30
31						3	0	0	11	2	0	0	7	0	0	3	1/2	9	1	1	16	0	6	1/2	0	8	0	65	3	0	3	0	31
CFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	CFS
Acre/FT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Acre/FT

1861.50

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **June** 2020

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1			3		2	3	0	0	11	2	1/2	0	7	0	0	3	1/2	9	1	1	16	0	6	0	0	8	0	70	0	0	3	0	1
2			3		2	5	1	0	5	2	1/2	0	7	0	0	3	1/2	9	1	1	16	0	9	0	0	3	0	70	1	1	3	0	2
3			3		2	5	1	3	5	2	1/2	0	2	1	0	3	0	9	1	2	14	0	13	0	0	8	0	73	1	1	3	0	3
4			3		2	5	1	3	6	2	1	0	1	1	3	3	3	9	1	2	12	0	13	1	0	11	0	75	2	3	3	0	4
5			3		2	3	1	3	6	2	1	0	1	1	3	3	3	9	1	2	13	0	13	1	0	11	0	75	0	0	3	0	5
6			3		2	3	1	3	8	0	1		1	1	3	3	3	6	1	1	8	0	11	1		11	0	75	0	0	3		6
7			3		2	3	1	3	8	0	1		0	1	3	3	3	6	1	1	8	0	11	1		11	0	75	0	0	3		7
8			2		2	0	1	0	4	0	1	0	0	1	3	3	3	6	1	1	3	0	9	1	0	8	0	43	3	10	0	0	8
9			3		2	0	1	0	4	0	1	0	0	1	3	3	3	6	2	1	3	0	9	1	0	8	1	43	3	10	0	0	9
10			0		0	0	0	0	5	0	1		0	1	3	3	3	6	2	1	10	0	10	1		8	1	43	3	10	0	0	10
11			0		0	5	0	0	5	0	1		0	1	3	3	3	6	2	1	13	0	10	1		8	1	40	5	5	0	0	11
12			0		0	3	0	0	5	0	0		0	2	3	3	3	6	2	1	11	2	10	1		8	1	40	5	5	3		12
13			0		0	3	1	0	4	1	0	0	1	2	3	3	3	6	2	1	6	2	10	1		8	1	40	5	5	3		13
14						3	1	0	4	1	0		1	2	3	3	3	6	2	1	6	0	10	1		8	1	40	5	5	3		14
15						3	1	0	4	1	0		1	2	3	3	3	6	2	1	6	0	10	1		8	1	40	5	5	3		15
16						3	1	0	3	0	0	0	1	2	0	0	0	3	2	1	2	0	10	1	0	8	0	40	5	5	3	0	16
17						3	1	0	3	0	0		1	2	0		0	3	2	1	2	0	10	1		8	0	40	5	5	0		17
18						3	1	0	3	0	0		0	2				3	2	0	2	0	10	1		8	0	40	5	5	0		18
19						3	0	0	3	0	0		0	2				3	2	0	5	0	10	1		8	0	40	9	5	0	0	19
20						3	0	0	3	0	0			2				3	2		5	0	4	1		8	0	35	9	5			20
21						3	0	0	3	0	0			2				3	2		5	0	4	1		8	0	35	9	5			21
22						3	0	0	3	0	0			2				3	2		7	0	0	0	0	0	0	35	9	5			22
23						3	0	0	3	1	0			2				3	2		9	0	0	0		0	0	30	9	5			23
24						3	0	0	3	1	0			2				3	2		9	0	0	0		0	0	30	9	5			24
25			0			0	0	0	4	1	0			2				4	1		9	0	3	0		3	1	30	9	5			25
26			3			0	0	0	4	1	0	0	0	2	0	0	0	4	1	0	9	0	10	3	0	5	1	30	4	7	0	0	26
27			3			0	0	0	4	0	0			2				4	2		9	0	9	3		5	1	30	4	7			27
28			3			0	0	0	4	0	0			2				4	2		9	5	9	3		5	1	30	4	7			28
29			0			0	0	0	4	0	0			2				4	2		2	5	3	0		3	1	30	4	7			29
30			0		0	0	0	0	4	0	0	0	0	2	0	0	0	4	2	0	3	0	3	0	0	3	1	29	10	7	0	0	30
31								15	135	17	96		24	47	30	45	31	154		20	9												31
CFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	CFS
Acre/FT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Acre/FT

1825

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **July** 2020

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1			0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	4	2	0	10	0	3	0	0	3	1	24	5	10	0	0	1
2									3	1								4	1	0	10	1	3	0		3	1	24	5	10	0	0	2
3									3	1								4	1	0	13	1	3	0		3	1	24	5	10	0	0	3
4									3	1								4	1	0	13	2	3	0		3	1	24	5	10	0	0	4
5									3	1								4	1	0	13	2	3	0		3	1	24	5	10	0	0	5
6									3	1								4	1	0	14	2	3	0	0	3	1	24	5	10	0	0	6
7									3	1								4	1	0	14	0	3	0		3	1	24	3	8	0	0	7
8									3	3								4	1	0	16	0	3	0		3	1	24	3	8	0	0	8
9									3	3								4	1	0	16	1	10	0	0	3	1	24	3	8	5	3	9
10						0			3	3	0	0	0	0	0	0	0	7	2	0	16	0	10	0	0	3	1	43	3	8	5	3	10
11									3	3								7	2	1	18		10	0	0	3	1	48	3	1	7	3	11
12									3	3								7	2	1	18		10	0		3	1	48	3	1	7	3	12
13									3	3			0					7	2	1	18	1	11	0		3	1	53	3	1	8	3	13
14						0	0	0	9	3	0	0	7	0	0	0	0	7	2	1	16	4	12	2	0	4	1	53	3	6	10	3	14
15							0		9	3	0		7					8	2	1	22	0	12	2	0	4	1	53	3	6	10	3	15
16						0	1		11	3	0		7					8	2	1	22	1	12	2		4	1	57	3	6	10	3	16
17						3	1	0	15	3	½	0	2	0	0	0	0	8	2	1	22.5	0	12	2	0	5	1	57	4	4	10	3	17
18						4	0	0	9	3	½	0	2	0	0	0	0	8	1	2	22.5	½	12	2	0	5	1	53	7	8	10	3	18
19				2		4	0		8	3	½		2					8	1	2	22		12	2		7	1	53	7	8	10	3	19
20				3		4	0		10	3	½	0	2	0	0	0	0	8	1	2	18	2RH	5	2		7	1	45	7	8	10	3	20
21				3		2	1	0	11	3	1	0	2	0	0	3	0	9	1	2	16	2	4	2	0	8	1	46	2	4	10	3	21
22				3		2	1	0	13	3	1	0	2	0	0	0	0	10	1	2	14	½	4	2	0	8	1	54	2	0	10	3	22
23				3		2	1		13	3	1		1			0	½	10	1	1	14	½	9	2		12	1	63	2	0	10	3	23
24				3		2	1		13	3	1		1			0	½	10	1	1	16	½	9	2		12	1	63	2	0	10	3	24
25				3		2	1		13	3	1		1			0	½	4	1	1	16		9	2		12	1	63	2	0	10	3	25
26				3		2	1		13	3	1		0			0	½	4	1	1	16		9	2		12	1	63	2	4	10	3	26
27				3		2	1		13	3	1		0	0		0	½	4	1	1	14	2	9	2		12	1	68	2	4	3	3	27
28				3		2	1		12	3	1			2		0	½	4	1	1	14	½	9	2		12	1	73	2	0	3	3	28
29				3		2	1		10	3	1		0	2		3	½	4	1	2	14	0	12	2	0	12	1	73	2	0	3	3	29
30				3		6	1		11	2	1		1	2		3	½	4	1	2	16	½	12	2		12	1	73	2	0	10	3	30
31				3		4	1	0	9	2	1	0	1	2	0	3	½	5	1	2	16	½	11	0	0	9	1	73	1	0	16	3	31
CFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	CFS
Acre/FT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Acre/FT

B
323

HELENA VALLEY IRRIGATION DISTRICT / DIVISION 1

Month **August** **2020**

Date	B	1	2/2A	2B	3	Lat. 5.3	8	9	Lat. 6.3	23	Lat. 6.9	26	Lat. 7.9	31/31A	32	33	34	Lat. 9.2	Spl	40	Lat. 10.1	Spl	Lat. 11.9	62A 63	64	Lat. 14.3	Spl	Lat. 14.8	Spl A	Spl B	Supp 1	Supp 2	Date
1						6	0	0	14	2	½	0	10	2	0	3	0	5	1	2	16		11	2	0	9	1	73	1	0	10	3	1
2						6	0	0	14	2	½	0	10	2	0	3	0	5	1	2	16		11	2	0	9	1	73	1	0	10	3	2
3						6	1	0	8	2	½	0	10	2	0	3	0	5	1	2	19		11	2	0	9	1	78	1	0	3	3	3
4						6	1	0	7	2	½	0	2	2	0	3	0	5	1	1	21	2½	11	2	0	9	1	78	1	0	10	3	4
5						6	1	0	6	2	1	0	3	2	3	3	3	5	1	0	19	2	11	2	0	9	1	80	0	0	10	3	5
6						6	1	0	6	2	1	0	3	2	3	3	3	6	1	0	14	3	11	2	0	9	1	80	0	0	13	3	6
7						6	1	0	8	0	1	0	3	2	3	3	3	6	1	0	12.5	2	10	2	0	6	1	80	0	0	13	3	7
8						5	1	0	8	0	1	0	3	2	3	3	3	5	1	0	14.5	½	10	2	0	5	1	80	1	0	13	3	8
9						5	1	0	8	0	1	0	0	2	3	3	3	4	1	0	14.5		10	2	0	5	1	80	1	0	13	3	9
10						3	1	0	15	0	1	0	0	2	3	3	3	4	1	1	15.5		12	2	0	5	1	75	1	1	10	3	10
11						3	1	0	15	0	1	0	0	2	3	3	3	4	1	1	15	2	12	2	0	8	1	70	1	0	10	3	11
12						3	1	0	17	0	1	0	0	2	0	3	0	3	1	2	17	[illegible]	12	2	0	7	1	65	1	0	10	3	12
13						3	1	0	17	0	1	0	0	2	0	3	0	5	1	2	17	1	12	2	0	9	1	50	0	0	10	3	13
14						3	1	0	17	0	1	0	1	2	0	3	0	4	1	2	18	½	12	2	0	9	1	42	1	5	10	3	14
15						3	1	0	17	0	1	0	1	2	0	3	0	4	1	2	17	1½	12	2	0	7	1	42	1	5	10	3	15
16						3	1	0	17	0	1	0	1	2	0	3	0	4	1	2	17		12	2	0	7	1	42	1	5	10	3	16
17						3	1	3	17	0	1	0	1	2	0	3	0	4	1	2	15½	1½	12	2	0	7	1	42	1	5	10	3	17
18						3	1	3	17	0	1	0	1	2	0	3	0	4	1	2	16½	0	9	2	0	5	½	36	0	2	10	3	18
19						3	1	3	17	1	1	0	1	2	0	3	0	4	1	2	13½	0	7	2	0	5	1	36	0	2	10	3	19
20						3	0	3	16	3	1	0	1	2	0	3	0	4	1	2	15½	0	7	2	0	5	1	38	0	3	13	2	20
21						2	0	3	6	3	0	0	0	2	0	3	0	4	1	2	15½	1½	7	2	0	4	1	49	0	0	13	2	21
22						2	0	3	6	3	0	0	0	2	0	3	0	4	1	2	15	½	7	2	0	4	1	49	0	0	13	2	22
23						2	0	3	6	3	0	0	0	2	0	3	0	4	1	2	15	½	7	2	0	4	1	49	0	0	13	2	23
24						2	0	0	4	3	0	0	0	2	0	3	0	4	1	2	19	½	7	2	0	4	1	49	0	0	13	0	24
25						2	0	0	5	3	0	0	0	2	0	3	0	4	1	1	18	½	7	2	0	5	1	49	3	8	13	0	25
26						2	0	0	5	3	0	0	0	2	0	3	0	4	1	0	20	2	4	2	0	3	1	49	3	8	13	0	26
27						2	0	0	5	3	0	0	0	2	0	3	0	4	1	0	18	2½	4	2	0	3	1	45	3	9	13	0	27
28						2	0	0	3	3	0	0	0	2	0	3	0	4	1	0	16	2	4	2	0	3	1	40	4	7	13	0	28
29						2	0	0	3	3	0	0	0	0	0	3	0	4	1	0	16		4	2	0	3	1	40	10	10	13	0	29
30						2	0	0	3	3	0	0	0	0	0	0	0	4	1	0	16		4	2	0	3	1	40	10	10	13	0	30
31						2	0	0	3	3	0	0	0	0	0	0	0	4	1	1	14	1½	4	2	0	3	1	35	10	10	13	0	31
CFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	CFS
AF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Acre/FT

HVID WATER USAGE LATERAL 11.9

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602
(406) 442-3292
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Water Usage Report 2018

Guderian Nevin	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	11.9	61	7	12	1200	0.50	0.496	7	18	1000	0.50	0.413	5	4.958	5.866
			7	25	1500	0.50	0.372	7	31	900	0.50	0.372	5	4.958	5.701
			8	9	1300	0.50	0.454	8	15	900	0.50	0.372	5	4.958	5.784
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															17.351

AC/FT Allocated		42.000
Used To Date		17.351
Balance		**24.649** Acre Feet
Excess Water	$	7.00
Total Paid	$	-
Total Due	**$**	**-**

Amount Paid

Total Paid $ -

<< ***AMOUNT DUE ON OR BEFORE DECEMBER 30, 2018***

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602
(406) 442-3292
www.hvid-mt.com

Water Usage Report **2018**

Johnson Bob & Judy	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	11.9	58 X	5	23	800	0.50	0.661	5	30	1700	0.50	0.702	6	5.949	7.312
			5	30	1700	2.00	1.157	5	31	2400	2.00	3.966	0	0.000	5.123
			6	1	100	2.00	3.801	6	11	1300	2.00	2.148	9	35.694	41.643
			7	25	800	2.50	3.305	7	31	2400	2.50	4.958	5	24.788	33.050
			8	1	100	2.50	4.751	8	21	1000	2.50	2.066	19	94.193	101.009
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
BOR - 87.5							0.000				0.00	0.000	-1	0.000	0.000
HVID - 52.9							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															188.137

AC/FT Allocated		246.200	
Used To Date		188.137	
Balance		**58.063**	**Acre Feet**
Excess Water	$	7.00	
Total Paid	$	-	
Total Due	**$**	**-**	

Amount Paid

Total Paid $ -

<< *AMOUNT DUE ON OR BEFORE DECEMBER 30, 2018*

Helena Valley Irrigation District
3840 North Montana Avenue, Helena, MT 59602
(406) 442-3292
www.hvid-mt.com

Water Usage Report **2018**

Brown David	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	11.9	58 +	6	13	2200	1.50	0.248	6	15	800	1.50	0.992	1	2.975	4.214
	11.9	58 Y	6	15	1700	1.50	0.868	6	17	1000	1.50	1.239	1	2.975	5.081
	11.9	58 X	7	6	1500	1.50	1.115	7	31	2400	1.50	2.975	24	71.388	75.478
83 - 24 hr set	14.8	83A	7	10	800	1.00	1.322	7	15	800	1.00	0.661	4	7.932	9.915
	11.9	60 X	7	18	800	2.00	2.644	7	20	800	2.00	1.322	1	3.966	7.932
	11.9	83	7	25	2100	4.00	0.992	7	26	1300	4.00	4.297	0	0.000	5.288
	14.8	83A	7	30	1300	1.00	0.909	7	31	2400	1.00	1.983	0	0.000	2.892
	14.8	83A	8	1	100	1.00	1.900	8	8	800	1.00	0.661	6	11.898	14.459
	14.8	58 X	8	1	100	1.50	2.851	8	3	1200	1.50	1.487	1	2.975	7.312
	14.8	83A	9	2	1400	1.25	1.033	9	6	700	1.25	0.723	3	7.436	9.192
	14.8	83	8	20	1400	4.00	3.305	8	21	1800	4.00	5.949	0	0.000	9.254
	14.8	83	8	24	1100	0.50	0.537	8	31	2400	0.50	0.992	6	5.949	7.478
	14.8	83A	9	1	100	0.50	0.950	9	6	700	0.50	0.289	4	3.966	5.205
	14.8	83	9	11	1200	4.00	3.966	9	12	1200	4.00	3.966	0	0.000	7.932
	14.8	83A	9	11	1700	1.00	0.578	9	14	800	1.00	0.661	2	3.966	5.205
	11.9	58 X	9	16	1500	1.50	1.115	9	22	1700	1.50	2.107	5	14.873	18.095
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															194.933

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602

(406) 442-3292

Brown David	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
BOR - 87.5							0.000				0.00	0.000	-1	0.000	0.000
HVID - 160.4							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															0.000

AC/FT Allocated	568.700	
Used To Date	194.933	
Balance	**373.767**	**Acre Feet**
Excess Water	$ 7.00	
Total Paid	$ -	
Total Due	**$ -**	

Amount Paid

Total Paid $ -

<< ***AMOUNT DUE ON OR BEFORE DECEMBER 30, 2018***

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602
(406) 442-3292
www.hvid-mt.com

Water Usage Report

2018

Foster Chip	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	HVC	62	7	6	1200	1.50	1.487	7	31	2400	1.50	2.975	24	71.388	75.850
	HVC	63	7	11	1500	2.00	1.487	7	31	2400	2.00	3.966	19	75.354	80.807
	14.3	66	7	11	1500	1.50	1.115	7	31	2400	1.50	2.975	19	56.516	60.605
	14.3	69A	7	11	1500	1.00	0.744	7	31	2400	1.00	1.983	19	37.677	40.404
	11.9	54A	7	6	1700	1.50	0.868	7	19	1300	1.50	1.611	12	35.694	38.173
	11.9	54A	7	19	1300	2.00	1.818	7	23	1300	2.00	2.148	3	11.898	15.864
	11.9	54A	7	23	1300	1.00	0.909	7	31	2400	1.00	1.983	7	13.881	16.773
	HVC	62	8	1	100	1.50	2.851	8	31	2400	1.50	2.975	29	86.261	92.086
	HVC	63	8	1	100	2.00	3.801	8	31	2400	2.00	3.966	29	115.014	122.781
	14.3	66	8	1	100	1.50	2.851	8	18	900	1.50	1.115	16	47.592	51.558
	14.3	69A	8	1	100	1.00	1.900	8	16	900	1.00	0.744	14	27.762	30.406
	11.9	54A	8	1	100	1.00	1.900	8	3	1200	1.00	0.992	1	1.983	4.875
	11.9	61A	7	27	1500	3.00	2.231	7	31	2400	3.00	5.949	3	17.847	26.027
	11.9	61A	8	1	100	3.00	5.701	8	6	1100	3.00	2.727	4	23.796	32.224
	14.3	68	7	27	1200	3.00	2.975	7	31	2400	3.00	5.949	3	17.847	26.771
	14.3	68	8	1	100	3.00	5.701	8	6	1000	3.00	2.479	4	23.796	31.976
	HVC	62	9	1	100	1.50	2.851	9	20	800	1.50	0.992	18	53.541	57.383
	HVC	63	9	1	100	2.00	3.801	9	20	800	2.00	1.322	18	71.388	76.511
	14.3	66	9	7	1200	1.50	1.487	9	26	1700	1.50	2.107	18	53.541	57.135
	14.3	68	9	7	1200	3.00	2.975	9	15	1000	3.00	2.479	7	41.643	47.096
	14.3	69A	9	7	1300	1.00	0.909	9	25	800	1.00	0.661	17	33.711	35.281
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															1,020.584

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602

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Foster Bill	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
Trego 41.6 AC							0.000				2.00	0.000	-1	0.000	0.000
Siewert 38.4 AC							0.000				0.00	0.000	-1	0.000	0.000
FosterC 138.1 AC							0.000				0.00	0.000	-1	0.000	0.000
Foster W 318.1 AC							0.000				0.00	0.000	-1	0.000	0.000
Total = **536.2 AC**							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															0.000

AC/FT Allocated		1,608.600
Used To Date		1,020.584
Balance		**588.016** Acre Feet
Excess Water	$	7.00
Total Paid	$	-
Total Due	**$**	-

Amount Paid

Total Paid $ -

<< ***AMOUNT DUE ON OR BEFORE DECEMBER 30, 2018***

Helena Valley Irrigation District

3840 North Montan Avenue, Helena, MT 59602
(406) 442-3292
www.hvid-mt.com

Water Usage Report

2019

Foster Chip	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	14.3	66	6	4	1100	1.50	1.611	6	30	2400	1.50	2.975	25	74.363	78.948
	14.3	69A	6	4	1100	1.00	1.074	6	30	2400	1.00	1.983	25	49.575	52.632
	11.9	61A	6	12	800	1.00	1.322	6	30	2400	1.00	1.983	17	33.711	37.016
	HVC	63	6	6	1900	1.00	0.413	6	30	2400	1.00	1.983	23	45.609	48.005
	14.3	66	7	1	100	1.50	2.851	7	2	1000	1.50	1.239	0	0.000	4.090
	14.3	68	7	2	1000	3.00	3.470	7	8	1400	3.00	3.470	5	29.745	36.686
	14.3	69A	7	1	100	1.00	1.900	7	1	800	1.00	0.661	-1	(1.983)	0.578
	11.9	61A	7	1	100	1.00	1.900	7	29	800	1.00	0.661	27	53.541	56.102
	HVC	63	7	1	100	1.00	1.900	7	31	2400	1.00	1.983	29	57.507	61.390
	14.3	66	7	20	1000	1.50	1.735	7	31	2400	1.50	2.975	10	29.745	34.455
	14.3	69A	7	22	1300	1.00	0.909	7	31	2400	1.00	1.983	8	15.864	18.756
	14.3	69A	8	1	100	1.00	1.900	8	23	800	1.00	0.661	21	41.643	44.204
	HVC	63	8	1	100	1.00	1.900	8	2	900	1.00	0.744	0	0.000	2.644
	HVC	63	8	2	900	2.00	2.479	8	23	800	2.00	1.322	20	79.320	83.121
	HVC	62	8	2	900	2.00	2.479	8	23	800	2.00	1.322	20	79.320	83.121
	11.9	61A	8	6	1000	2.00	2.314	8	12	800	2.00	1.322	5	19.830	23.466
	11.9	61A	8	12	800	1.00	1.322	8	23	800	1.00	0.661	10	19.830	21.813
	14.3	66	8	1	100	1.50	2.851	8	17	1000	1.50	1.239	15	44.618	48.707
	14.3	68	8	6	1000	3.00	3.470	8	12	1100	3.00	2.727	5	29.745	35.942
	14.3	66	8	30	1000	1.50	1.735	8	31	2400	1.50	2.975	0	0.000	4.710
	14.3	66	9	1	100	1.50	2.851	9	24	900	1.50	1.115	22	65.439	69.405
	HVC	62	9	6	800	2.00	2.644	9	12	800	2.00	1.322	5	19.830	23.796
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															869.587

Helena Valley Irrigation District

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Foster Chip	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
Trego 41.6 AC							0.000				2.00	0.000	-1	0.000	0.000
Siewert 38.4 AC							0.000				0.00	0.000	-1	0.000	0.000
FosterC 138.1 AC							0.000				0.00	0.000	-1	0.000	0.000
Foster W 318.1 AC							0.000				0.00	0.000	-1	0.000	0.000
Total = **536.2 AC**							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															0.000

AC/FT Allocated 1,608.600

Used To Date 869.587

Balance **739.013** **Acre Feet**

Excess Water $ 7.00

Total Paid $ -

Total Due $ - << ***AMOUNT DUE ON OR BEFORE APRIL 1, 2020***

Amount Paid

Total Paid $ -

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602
(406) 442-3292
www.hvid-mt.com

Water Usage Report **2019**

Johnson Bob & Judy	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	11.9	58 ✗	6	5	1700	2.50	1.446	6	21	1700	2.50	3.512	15	74.363	79.320
			7	31	800	1.50	1.983	7	31	2400	1.50	2.975	-1	(2.975)	1.983
			8	1	100	1.50	2.851	8	12	1100	1.50	1.363	10	29.745	33.959
			8	20	800	2.00	2.644	8	24	1000	2.00	1.653	3	11.898	16.195
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
BOR - 87.5							0.000				0.00	0.000	-1	0.000	0.000
HVID - 52.9							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															131.456

AC/FT Allocated	246.200	
Used To Date	131.456	
Balance	**114.744**	**Acre Feet**
Excess Water	$ 7.00	
Total Paid	$ -	
Total Due	**$ -**	

Amount Paid

Total Paid $ -

<< ***AMOUNT DUE ON OR BEFORE APRIL 1, 2020***

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602

(406) 442-3292

www.hvid-mt.com

Water Usage Report **2019**

Guderian Nevin	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	11.9	61 X	6	5	1100	0.50	0.537	6	10	1600	0.50	0.661	4	3.966	5.164
			7	31	1300	0.50	0.454	7	31	2400	0.50	0.992	-1	(0.992)	0.454
			8	1	100	0.50	0.950	8	5	1500	0.50	0.620	3	2.975	4.544
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															10.163

AC/FT Allocated	42.000	
Used To Date	10.163	
Balance	**31.837**	**Acre Feet**
Excess Water	$ 7.00	
Total Paid	$ -	
Total Due	**$ -**	

Amount Paid

Total Paid $ -

<< *AMOUNT DUE ON OR BEFORE APRIL 1, 2020*

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602
(406) 442-3292
www.hvid-mt.com

Water Usage Report 2019

Brown David	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	11.9	58 X	6	21	1500	1.50	1.115	6	24	1000	1.50	1.239	2	5.949	8.304
	11.9	58 X	7	1	1400	1.50	1.239	7	5	800	1.50	0.992	3	8.924	11.154
	11.9	58 X	7	7	800	1.00	1.322	7	10	800	1.00	0.661	2	3.966	5.949
	11.9	58 X	7	15	1500	1.50	1.115	7	19	1600	1.50	1.983	3	8.924	12.022
	11.9	58 X	7	25	1500	1.50	1.115	7	30	800	1.50	0.992	4	11.898	14.005
	11.9	60 X	6	13	1500	1.00	0.744	6	24	1000	1.00	0.826	10	19.830	21.400
	14.8	83	6	1	800	0.50	0.661	6	7	1200	0.50	0.496	5	4.958	6.114
	14.8	83	6	7	1200	4.00	3.966	6	8	800	4.00	2.644	0	0.000	6.610
	14.8	83	7	15	1500	4.00	2.975	7	16	1400	4.00	4.627	0	0.000	7.602
	14.8	85	6	10	800	1.00	1.322	6	12	600	1.00	0.496	1	1.983	3.801
	14.8	85	7	19	700	1.50	2.107	7	23	800	1.50	0.992	3	8.924	12.022
	14.8	83A	8	1	800	0.50	0.661	8	7	800	0.50	0.331	5	4.958	5.949
	14.8	83A	8	19	900	0.50	0.620	8	26	2200	0.50	0.909	6	5.949	7.478
	14.8	83	8	30	800	4.00	5.288	8	31	2400	4.00	7.932	0	0.000	13.220
	14.8	83	9	1	100	4.00	7.602	9	1	1200	4.00	3.966	-1	(7.932)	3.636
	11.9	60 X	8	30	800	0.50	0.661	8	31	2400	0.50	0.992	0	0.000	1.653
	11.9	60 X	9	1	100	0.50	0.950	9	1	1200	0.50	0.496	-1	(0.992)	0.454
	14.8	83A	9	1	1200	1.00	0.992	9	6	1000	1.00	0.826	4	7.932	9.750
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															151.121

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602
(406) 442-3292

Brown David	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
BOR - 87.5							0.000				0.00	0.000	-1	0.000	0.000
HVID - 160.4							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
							0.000				0.00	0.000	-1	0.000	0.000
															0.000

AC/FT Allocated		568.700	
Used To Date		151.121	
Balance		**417.579**	**Acre Feet**
Excess Water	$	7.00	
Total Paid	$	-	
Total Due	**$**	**-**	

Amount Paid

Total Paid $ -

<< ***AMOUNT DUE ON OR BEFORE APRIL 1, 2020***

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602
(406) 442-3292
www.hvid-mt.com

Water Usage Report **2020**

Brown David	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	11.9	58 X	6	2	1600	1.50	0.99	6	8	1000	1.50	1.24	5	14.87	17.10
	11.9	58 X	6	17	1400	1.50	1.24	6	20	1000	1.50	1.24	2	5.95	8.43
	11.9	58 X	6	26	1500	1.50	1.12	6	29	800	1.50	0.99	2	5.95	8.06
	11.9	58 X	7	9	2100	1.50	0.37	7	20	1000	1.50	1.24	10	29.75	31.36
	11.9	58 X	7	29	1400	1.50	1.24	7	31	1400	1.50	1.74	1	2.97	5.95
	14.8	83	5	21	900	4.00	4.96	5	22	1200	4.00	3.97	0	0.00	8.92
	14.8	83	7	15	1500	4.00	2.97	7	16	1800	4.00	5.95	0	0.00	8.92
	14.8	85	5	18	1400	1.50	1.24	5	21	800	1.50	0.99	2	5.95	8.18
	14.8	85	7	13	800	2.00	2.64	7	15	1500	2.00	2.48	1	3.97	9.09
	14.8	83A	5	15	1700	1.00	0.58	5	18	1800	1.00	1.49	2	3.97	6.03
	14.8	83A	5	30	1300	1.00	0.91	5	31	2400	1.00	1.98	0	0.00	2.89
	14.8	83A	6	1	100	1.00	1.90	6	2	2300	1.00	1.90	0	0.00	3.80
	14.8	83A	6	26	800	1.00	1.32	6	30	2400	1.00	1.98	3	5.95	9.25
	14.8	83A	7	1	100	1.00	1.90	7	1	800	1.00	0.66	-1	(1.98)	0.58
	14.8	83A	7	9	800	1.00	1.32	7	13	800	1.00	0.66	3	5.95	7.93
	14.8	83A	7	21	900	1.00	1.24	7	28	800	1.00	0.66	6	11.90	13.80
	14.8	58 X	8	14	1300	1.00	0.91	8	18	1400	1.00	1.16	3	5.95	8.01
	14.8	83A	8	17	1100	1.00	1.07	8	22	800	1.00	0.66	4	7.93	9.67
	14.8	83	8	18	1200	4.00	3.97	8	19	1400	4.00	4.63	0	0.00	8.59
	14.8	85	8	22	800	1.00	1.32	8	26	800	1.00	0.66	3	5.95	7.93
	14.8	83A	8	26	800	1.00	1.32				1.00	0.00	-27	(53.54)	(52.22)
	11.9	58 X	8	26	1500	1.00	0.74				1.00	0.00	-27	(53.54)	(52.80)
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
															79.49

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602
(406) 442-3292

Brown David	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
BOR - (0.0) 87.5							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
Brown - 112.2							0.00				0.00	0.00	-1	0.00	0.00
Merritt - 37.3							0.00				0.00	0.00	-1	0.00	0.00
Total - 149.5							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
															0.00

AC/FT Allocated	448.50	
Used To Date	79.49	
Balance	**369.01**	**Acre Feet**
Excess Water	$ 7.00	
Total Paid	$ -	
Total Due	**$ -**	

Amount Paid

Total Paid $ -

<< ***AMOUNT DUE ON OR BEFORE SEPTEMBER 30, 2020***

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602
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Water Usage Report **2020**

Johnson Judy	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	11.9	58 x	6	10	1400	2.50	2.07	6	17	1400	2.50	2.89	6	29.75	34.70
	11.9	58 x	7	23	1400	2.50	2.07	7	31	2400	2.50	4.96	7	34.70	41.73
	11.9	58 x	8	1	100	2.50	4.75	8	3	1500	2.50	3.10	1	4.96	12.81
	11.9	60 x	8	10	1500	1.00	0.74	8	14	1200	1.00	0.99	3	5.95	7.68
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
BOR - 0.00 (87.5)							0.00				0.00	0.00	-1	0.00	0.00
HVID - 52.9							0.00				0.00	0.00	-1	0.00	0.00
TWSC - 70.0							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
															96.92

AC/FT Allocated		228.70
Used To Date		96.92
Balance		**131.78** Acre Feet
Excess Water	$	7.00
Total Paid	$	-
Total Due	**$**	**-**

<< ***AMOUNT DUE ON OR BEFORE SEPTEMBER 30, 2020***

Amount Paid

Total Paid $ -

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602
(406) 442-3292
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Water Usage Report **2020**

Guderian Nevin	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	11.9	61 X	5	13	1200	0.50	0.50	5	19	1000	0.50	0.41	5	4.96	5.87
			5	29	1300	0.50	0.45	5	31	2400	0.50	0.99	1	0.99	2.44
			6	1	100	0.50	0.95	6	4	1300	0.50	0.54	2	1.98	3.47
			7	15	1400	0.50	0.41	7	21	1500	0.50	0.62	5	4.96	5.99
			7	31	1300	0.50	0.45	7	31	2400	0.50	0.99	-1	(0.99)	0.45
			8	1	100	0.50	0.95	8	7	1100	0.50	0.45	5	4.96	6.36
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
							0.00				0.00	0.00	-1	0.00	0.00
															24.58

AC/FT Allocated		42.00
Used To Date		24.58
Balance		**17.42** Acre Feet
Excess Water	$	7.00
Total Paid	$	-
Total Due	**$**	**-**

<< ***AMOUNT DUE ON OR BEFORE SEPTEMBER 30, 2020***

Amount Paid

Total Paid $ -

Helena Valley Irrigation District

3840 North Montan Avenue, Helena, MT 59602
(406) 442-3292
www.hvid-mt.com

Water Usage Report

2020

Foster Chip	Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
	HVC	62	6	26	900	2.00	2.48	6	29	900	2.00	1.49	2	7.93	11.90
	HVC	62	7	14	1000	1.50	1.74	7	31	800	1.50	0.99	16	47.59	50.32
	HVC	63	6	4	800	1.00	1.32	6	22	800	1.00	0.66	17	33.71	35.69
	HVC	63	6	26	1000	1.00	1.16	6	29	900	1.00	0.74	2	3.97	5.87
	HVC	63	7	16	2000	1.00	0.33	7	31	2400	1.00	1.98	14	27.76	30.08
	HVC	63	8	1	100	1.00	1.90				1.00	0.00	-2	(3.97)	(2.07)
	14.3	66	5	29	1000	1.50	1.74	5	31	2400	1.50	2.97	1	2.97	7.68
	14.3	66	6	1	100	1.50	2.85	6	22	800	1.50	0.99	20	59.49	63.33
	14.3	66	6	26	1000	1.50	1.74	6	29	900	1.50	1.12	2	5.95	8.80
	14.3	66	7	21	900	1.00	1.24	7	31	2400	1.00	1.98	9	17.85	21.07
	14.3	66	8	1	100	1.00	1.90	8	18	1000	1.00	0.83	16	31.73	34.45
	14.3	68	7	23	1300	3.00	2.73	7	31	1300	3.00	3.22	7	41.64	47.59
	11.9	60A	5	30	800	1.00	1.32	5	31	2400	1.00	1.98	0	0.00	3.31
	11.9	60A	6	1	100	1.00	1.90	6	22	800	1.00	0.66	20	39.66	42.22
	11.9	61A	6	26	1000	1.00	1.16	6	29	900	1.00	0.74	2	3.97	5.87
	11.9	61A	7	14	1300	1.00	0.91	7	31	1400	1.00	1.16	16	31.73	33.79
	11.9	61A	7	31	1400	2.00	1.65	7	31	2400	2.00	3.97	-1	(3.97)	1.65
	11.9	61A	8	1	100	2.00	3.80	8	10	1000	2.00	1.65	8	31.73	37.18
	14.3	69A	5	29	1000	1.00	1.16	5	31	2400	1.00	1.98	1	1.98	5.12
	14.3	69A	6	1	100	1.00	1.90	6	22	800	1.00	0.66	20	39.66	42.22
	14.3	69A	6	26	900	1.00	1.24	6	29	900	1.00	0.74	2	3.97	5.95
	14.3	69A	7	17	1200	1.00	0.99	7	31	2400	1.00	1.98	13	25.78	28.75
	14.3	69A	8	1	100	1.00	1.90	8	11	1000	1.00	0.83	9	17.85	20.57
	14.3	61A	8	10	1000	3.00	3.47	8	18	1000	3.00	2.48	7	41.64	47.59
															588.95

Helena Valley Irrigation District

3840 North Montan Avenue, Helena, MT 59602
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Foster Chip		Lateral	T.O.	Month	Day On	Time Military	CFS	Ac/Ft On Day	Month	Day Off	Time Military	CFS	Ac/Ft Off Day	Total Days	Day Use	Total Ac/FT Usage
		HVC	62	8	10	1000	1.50	1.74				1.50	0.00	-11	(32.72)	(30.98)
		14.3	68	8	11	1100	3.00	3.22	8	15	900	3.00	2.23	3	17.85	23.30
		11.9	61A	8	18	1000	2.00	2.31	8	19	1100	2.00	1.82	0	0.00	4.13
		11.9	61A	8	19	1100	1.00	1.07				1.00	0.00	-20	(39.66)	(38.59)
Trego	41.6 AC	14.3	69A	8	25	1200	1.00	0.99				2.00	0.00	-26	(51.56)	(50.57)
Siewert	38.4 AC							0.00				0.00	0.00	-1	0.00	0.00
FosterC	138.1 AC							0.00				0.00	0.00	-1	0.00	0.00
Foster W	318.1 AC							0.00				0.00	0.00	-1	0.00	0.00
Total =	**536.2 AC**							0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
								0.00				0.00	0.00	-1	0.00	0.00
																(92.71)

AC/FT Allocated		1608.60
Used To Date		496.25
Balance		**1112.35** **Acre Feet**
Excess Water	$	7.00
Total Paid	$	-
Total Due	**$**	-

<< ***AMOUNT DUE ON OR BEFORE SEPTEMBER 30, 2020***

Amount Paid

Total Paid $ -

LATER 11.9 FLOW ANALYSIS

From: Sharon Foster
To: Shawn Higley
Subject: RE: Flow Measurements for Lateral 11.9
Date: Wednesday, August 26, 2020 8:11:56 AM

Here is what I got from Glen:

	Water Needed	Farmer gets	Water Loss
1 pivot	7.0 cfs	2.5 cfs	4.5 cfs
2 pivots	13.0 cfs	4.5 cfs	8.5 cfs
Max Water	22.0 cfs	4.5 cfs	17.5 cfs – includes flooding, wheel line, pivots

Hope this helps

Sharon K. Foster
HVID Office Manager
Helena Valley Irrigation District (HVID)
3840 N. Montana Avenue
Helena, MT 59602
(406) 442-3292

From: Shawn Higley <shigley@wwcengineering.com>
Sent: Wednesday, August 19, 2020 5:30 PM
To: Sharon Foster <sharonfoster@hvid-mt.com>
Subject: Flow Measurements for Lateral 11.9

Sharon,

Do we have any flow measurements available for Lateral 11.9 that would verify the 70% estimated seepage? If not can we get some this month? Thanks,

Shawn

WWC ENGINEERING
Shawn Higley, P.E. | Branch Manager
1275 Maple Street, Suite F | Helena, MT 59601
Tel 406-443-3962 | Cell 406-459-3379
WWCengineering.com

Date	Upstream Flow (cfs)	Guderian Usage (cfs)	Johnson Usage (cfs)	Foster Usage (cfs)	Brown Usage (cfs)	Downstream Flow (cfs)	Total Loss (cfs)
5/1/2018	3	0	0	0	0	0	3
5/2/2018	3	0	0	0	0	0	3
5/3/2018	3	0	0	0	0	0	3
5/4/2018	3	0	0	0	0	0	3
5/5/2018	3	0	0	0	0	0	3
5/6/2018	3	0	0	0	0	0	3
5/7/2018	3	0	0	0	0	0	3
5/8/2018	3	0	0	0	0	0	3
5/9/2018	3	0	0	0	0	0	3
5/10/2018	3	0	0	0	0	0	3
5/11/2018	3	0	0	0	0	0	3
5/12/2018	3	0	0	0	0	0	3
5/13/2018	3	0	0	0	0	0	3
5/14/2018	3	0	0	0	0	0	3
5/15/2018	3	0	0	0	0	0	3
5/16/2018	3	0	0	0	0	0	3
5/17/2018	4	0	0	0	0	0	4
5/18/2018	4	0	0	0	0	0	4
5/19/2018	4	0	0	0	0	0	4
5/20/2018	4	0	0	0	0	0	4
5/21/2018	4	0	0	0	0	0	4
5/22/2018	4	0	0	0	0	0	4
5/23/2018	6	0	0.5	0	0	0	5.5
5/24/2018	7	0	0.5	0	0	0	6.5
5/25/2018	9	0	0.5	0	0	0	8.5
5/26/2018	9	0	0.5	0	0	0	8.5
5/27/2018	9	0	0.5	0	0	0	8.5
5/28/2018	9	0	0.5	0	0	0	8.5
5/29/2018	9	0	0.5	0	0	0	8.5
5/30/2018	11	0	0.5	0	0	0	10.5
5/31/2018	11	0	2	0	0	0	9
6/1/2018	11	0	2	0	0	0	9
6/2/2018	11	0	2	0	0	0	9
6/3/2018	11	0	2	0	0	0	9
6/4/2018	11	0	2	0	0	0	9
6/5/2018	11	0	2	0	0	0	9
6/6/2018	11	0	2	0	0	0	9
6/7/2018	11	0	2	0	0	0	9
6/8/2018	11	0	2	0	0	0	9
6/9/2018	11	0	2	0	0	0	9
6/10/2018	11	0	2	0	0	0	9
6/11/2018	3	0	2	0	0	0	1
6/12/2018	3	0	0	0	0	0	3
6/13/2018	11	0	0	0	1.5	0	9.5

6/14/2018	10	0	0	0	1.5	0	8.5
6/15/2018	3	0	0	0	1.5	0	1.5
6/16/2018	3	0	0	0	1.5	0	1.5
6/17/2018	3	0	0	0	1.5	0	1.5
6/18/2018	3	0	0	0	0	0	3
6/19/2018	3	0	0	0	0	0	3
6/20/2018	3	0	0	0	0	0	3
6/21/2018	3	0	0	0	0	0	3
6/22/2018	3	0	0	0	0	0	3
6/23/2018	3	0	0	0	0	0	3
6/24/2018	3	0	0	0	0	0	3
6/25/2018	3	0	0	0	0	0	3
6/26/2018	3	0	0	0	0	0	3
6/27/2018	3	0	0	0	0	0	3
6/28/2018	3	0	0	0	0	0	3
6/29/2018	3	0	0	0	0	0	3
6/30/2018	3	0	0	0	0	0	3
7/1/2018	3	0	0	0	0	0	3
7/2/2018	3	0	0	0	0	0	3
7/3/2018	3	0	0	0	0	0	3
7/4/2018	3	0	0	0	0	0	3
7/5/2018	3	0	0	0	0	0	3
7/6/2018	10	0	0	0	1.5	0	8.5
7/7/2018	13	0	0	0	1.5	0	11.5
7/8/2018	13	0	0	0	1.5	0	11.5
7/9/2018	13	0	0	0	1.5	0	11.5
7/10/2018	13	0	0	0	1.5	0	11.5
7/11/2018	13	0	0	0	1.5	0	11.5
7/12/2018	13	0.5	0	0	1.5	0	11
7/13/2018	13	0.5	0	0	1.5	0	11
7/14/2018	13	0.5	0	0	1.5	0	11
7/15/2018	13	0.5	0	0	1.5	0	11
7/16/2018	13	0.5	0	0	1.5	0	11
7/17/2018	13	0.5	0	0	1.5	0	11
7/18/2018	13	0.5	0	0	3.5	0	9
7/19/2018	13	0	0	0	3.5	0	9.5
7/20/2018	13	0	0	0	3.5	0	9.5
7/21/2018	13	0	0	0	1.5	0	11.5
7/22/2018	13	0	0	0	1.5	0	11.5
7/23/2018	5	0	0	0	1.5	0	3.5
7/24/2018	11	0	0	0	1.5	0	9.5
7/25/2018	11	0.5	2.5	0	1.5	0	6.5
7/26/2018	11	0.5	2.5	0	1.5	0	6.5
7/27/2018	11	0.5	2.5	3	1.5	0	3.5
7/28/2018	11	0.5	2.5	3	1.5	0	3.5
7/29/2018	11	0.5	2.5	3	1.5	0	3.5
7/30/2018	11	0.5	2.5	3	1.5	0	3.5

7/31/2018	11	0.5	2.5	3	1.5	0	3.5
8/1/2018	11	0	2.5	3	1.5	0	4
8/2/2018	11	0	2.5	3	1.5	0	4
8/3/2018	13	0	2.5	3	1.5	0	6
8/4/2018	13	0	2.5	3	0	0	7.5
8/5/2018	13	0	2.5	3	0	0	7.5
8/6/2018	9	0	2.5	3	0	0	3.5
8/7/2018	12	0	2.5	0	0	0	9.5
8/8/2018	12	0	2.5	0	0	0	9.5
8/9/2018	12	0.5	2.5	0	0	0	9
8/10/2018	12	0.5	2.5	0	0	0	9
8/11/2018	12	0.5	2.5	0	0	0	9
8/12/2018	12	0.5	2.5	0	0	0	9
8/13/2018	12	0.5	2.5	0	0	0	9
8/14/2018	12	0.5	2.5	0	0	0	9
8/15/2018	11	0.5	2.5	0	0	0	8
8/16/2018	8	0	2.5	0	0	0	5.5
8/17/2018	8	0	2.5	0	0	0	5.5
8/18/2018	8	0	2.5	0	0	0	5.5
8/19/2018	8	0	2.5	0	0	0	5.5
8/20/2018	8	0	2.5	0	0	0	5.5
8/21/2018	5	0	2.5	0	0	0	2.5
8/22/2018	3	0	0	0	0	0	3
8/23/2018	2	0	0	0	0	0	2
8/24/2018	2	0	0	0	0	0	2
8/25/2018	2	0	0	0	0	0	2
8/26/2018	2	0	0	0	0	0	2
8/27/2018	2	0	0	0	0	0	2
8/28/2018	2	0	0	0	0	0	2
8/29/2018	2	0	0	0	0	0	2
8/30/2018	2	0	0	0	0	0	2
8/31/2018	2	0	0	0	0	0	2
9/1/2018	2	0	0	0	0	0	2
9/2/2018	2	0	0	0	0	0	2
9/3/2018	2	0	0	0	0	0	2
9/4/2018	2	0	0	0	0	0	2
9/5/2018	2	0	0	0	0	0	2
9/6/2018	2	0	0	0	0	0	2
9/7/2018	2	0	0	0	0	0	2
9/8/2018	2	0	0	0	0	0	2
9/9/2018	2	0	0	0	0	0	2
9/10/2018	2	0	0	0	0	0	2
9/11/2018	2	0	0	0	0	0	2
9/12/2018	2	0	0	0	0	0	2
9/13/2018	10.5	0	0	0	0	0	10.5
9/14/2018	10.5	0	0	0	0	0	10.5
9/15/2018	9.5	0	0	0	0	0	9.5

9/16/2018	9.5	0	0	0	1.5	0	8
9/17/2018	9.5	0	0	0	1.5	0	8
9/18/2018	9.5	0	0	0	1.5	0	8
9/19/2018	9.5	0	0	0	1.5	0	8
9/20/2018	9.5	0	0	0	1.5	0	8
9/21/2018	9.5	0	0	0	1.5	0	8
9/22/2018	9.5	0	0	0	1.5	0	8
9/23/2018	2	0	0	0	0	0	2
9/24/2018	2	0	0	0	0	0	2
9/25/2018	2	0	0	0	0	0	2
9/26/2018	2	0	0	0	0	0	2
9/27/2018	2	0	0	0	0	0	2
9/28/2018	2	0	0	0	0	0	2
9/29/2018	2	0	0	0	0	0	2
9/30/2018	2	0	0	0	0	0	2

6.82 cfs average

834 cfs

1654 acre-feet

1403 acre-feet through August

Date	Upstream Flow (cfs)	Guderian Usage (cfs)	Johnson Usage (cfs)	Foster Usage (cfs)	Brown Usage (cfs)	Downstream Flow (cfs)	Total Loss (cfs)
5/1/2019	0					0	0
5/2/2019	0					0	0
5/3/2019	0					0	0
5/4/2019	0					0	0
5/5/2019	0					0	0
5/6/2019	0					0	0
5/7/2019	0					0	0
5/8/2019	0					0	0
5/9/2019	0					0	0
5/10/2019	3					0	3
5/11/2019	3					0	3
5/12/2019	3					0	3
5/13/2019	3					0	3
5/14/2019	5					0	5
5/15/2019	5					0	5
5/16/2019	5					0	5
5/17/2019	5					0	5
5/18/2019	5					0	5
5/19/2019	5					0	5
5/20/2019	5					0	5
5/21/2019	5					0	5
5/22/2019	5					0	5
5/23/2019	5					0	5
5/24/2019	5					0	5
5/25/2019	5					0	5
5/26/2019	5					0	5
5/27/2019	5					0	5
5/28/2019	5					0	5
5/29/2019	5					0	5
5/30/2019	7.5					0	7.5
5/31/2019	7.5					0	7.5
6/1/2019	7					0	7
6/2/2019	7					0	7
6/3/2019	7					0	7
6/4/2019	14					0	14
6/5/2019	17	0.5	2.5			0	14
6/6/2019	18	0.5	2.5			0	15
6/7/2019	21	0.5	2.5			0	18
6/8/2019	23	0.5	2.5			0	20
6/9/2019	23	0.5	2.5			0	20
6/10/2019	23	0.5	2.5			0	20
6/11/2019	23		2.5			0	20.5
6/12/2019	23		2.5	1		0	19.5
6/13/2019	23		2.5	1	1	0	18.5

6/14/2019	23	2.5	1	1	0	18.5
6/15/2019	23	2.5	1	1	0	18.5
6/16/2019	23	2.5	1	1	0	18.5
6/17/2019	20	2.5	1	1	0	15.5
6/18/2019	17	2.5	1	1	0	12.5
6/19/2019	14	2.5	1	1	0	9.5
6/20/2019	13	2.5	1	1	0	8.5
6/21/2019	12	2.5	1	2.5	0	6
6/22/2019	12		1	2.5	0	8.5
6/23/2019	12		1	2.5	0	8.5
6/24/2019	12		1	2.5	0	8.5
6/25/2019	1		1		0	0
6/26/2019	1		1		0	0
6/27/2019	1		1		0	0
6/28/2019	4		1		0	3
6/29/2019	4		1		0	3
6/30/2019	4		1		0	3
7/1/2019	8		1	1.5	0	5.5
7/2/2019	8		1	1.5	0	5.5
7/3/2019	8		1	1.5	0	5.5
7/4/2019	8		1	1.5	0	5.5
7/5/2019	4		1	1.5	0	1.5
7/6/2019	8		1		0	7
7/7/2019	8		1	1	0	6
7/8/2019	8		1	1	0	6
7/9/2019	8		1	1	0	6
7/10/2019	3		1	1	0	1
7/11/2019	3		1		0	2
7/12/2019	4		1		0	3
7/13/2019	4		1		0	3
7/14/2019	4		1		0	3
7/15/2019	8		1	1.5	0	5.5
7/16/2019	8		1	1.5	0	5.5
7/17/2019	8		1	1.5	0	5.5
7/18/2019	7		1	1.5	0	4.5
7/19/2019	4		1	1.5	0	1.5
7/20/2019	4		1		0	3
7/21/2019	4		1		0	3
7/22/2019	4		1		0	3
7/23/2019	4		1		0	3
7/24/2019	4		1		0	3
7/25/2019	7		1	1.5	0	4.5
7/26/2019	7		1	1.5	0	4.5
7/27/2019	7		1	1.5	0	4.5
7/28/2019	7		1	1.5	0	4.5
7/29/2019	7		1	1.5	0	4.5
7/30/2019	7			1.5	0	5.5

7/31/2019	8	0.5	1.5			0	6
8/1/2019	8	0.5	1.5			0	6
8/2/2019	8	0.5	1.5			0	6
8/3/2019	8	0.5	1.5			0	6
8/4/2019	8	0.5	1.5			0	6
8/5/2019	8	0.5	1.5			0	6
8/6/2019	9.5		1.5	2		0	6
8/7/2019	9.5		1.5	2		0	6
8/8/2019	9.5		1.5	2		0	6
8/9/2019	11		1.5	2		0	7.5
8/10/2019	11		1.5	2		0	7.5
8/11/2019	11		1.5	2		0	7.5
8/12/2019	5		1.5	2		0	1.5
8/13/2019	5			1		0	4
8/14/2019	5			1		0	4
8/15/2019	5			1		0	4
8/16/2019	5			1		0	4
8/17/2019	5			1		0	4
8/18/2019	5			1		0	4
8/19/2019	6			1		0	5
8/20/2019	8		2	1		0	5
8/21/2019	8		2	1		0	5
8/22/2019	8		2	1		0	5
8/23/2019	7		2	1		0	4
8/24/2019	4		2			0	2
8/25/2019	4					0	4
8/26/2019	4					0	4
8/27/2019	4					0	4
8/28/2019	4					0	4
8/29/2019	4					0	4
8/30/2019	4				0.5	0	3.5
8/31/2019	4				0.5	0	3.5
9/1/2019	4				0.5	0	3.5
9/2/2019	4					0	4
9/3/2019	4					0	4
9/4/2019	4					0	4
9/5/2019	4					0	4
9/6/2019	4					0	4
9/7/2019	4					0	4
9/8/2019	4					0	4
9/9/2019	4					0	4
9/10/2019	4					0	4
9/11/2019	4					0	4
9/12/2019	4					0	4
9/13/2019	4					0	4
9/14/2019	4					0	4
9/15/2019	4					0	4

9/16/2019	4	0	4
9/17/2019	0	0	0
9/18/2019	0	0	0
9/19/2019	0	0	0
9/20/2019	0	0	0
9/21/2019	0	0	0
9/22/2019	0	0	0
9/23/2019	0	0	0
9/24/2019	0	0	0
9/25/2019	0	0	0
9/26/2019	0	0	0
9/27/2019	0	0	0
9/28/2019	0	0	0
9/29/2019	0	0	0
9/30/2019	0	0	0

6.49 cfs average

794 cfs

1575 acre-feet

1449 acre-feet through August

Date	Upstream Flow (cfs)	Guderian Usage (cfs)	Johnson Usage (cfs)	Foster Usage (cfs)	Brown Usage (cfs)	Downstream Flow (cfs)	Total Loss (cfs)
4/22/2020	3					0	3
4/23/2020	3					0	3
4/24/2020	3					0	3
4/25/2020	3					0	3
4/26/2020	3					0	3
4/27/2020	3					0	3
4/28/2020	3					0	3
4/29/2020	3					0	3
4/30/2020	3					0	3
5/1/2020	3					0	3
5/2/2020	3					0	3
5/3/2020	3					0	3
5/4/2020	3					0	3
5/5/2020	3					0	3
5/6/2020	3					0	3
5/7/2020	3					0	3
5/8/2020	3					0	3
5/9/2020	3					0	3
5/10/2020	3					0	3
5/11/2020	3					0	3
5/12/2020	3					0	3
5/13/2020	4	0.5				0	3.5
5/14/2020	4	0.5				0	3.5
5/15/2020	4	0.5				0	3.5
5/16/2020	4	0.5				0	3.5
5/17/2020	4	0.5				0	3.5
5/18/2020	4	0.5				0	3.5
5/19/2020	4	0.5				0	3.5
5/20/2020	4					0	4
5/21/2020	3					0	3
5/22/2020	3					0	3
5/23/2020	3					0	3
5/24/2020	3					0	3
5/25/2020	3					0	3
5/26/2020	3					0	3
5/27/2020	3					0	3
5/28/2020	3					0	3
5/29/2020	5	0.5				0	4.5
5/30/2020	6	0.5		1		0	4.5
5/31/2020	6	0.5		1		0	4.5
6/1/2020	6	0.5		1		0	4.5
6/2/2020	9	0.5		1	1.5	0	6
6/3/2020	13	0.5		1	1.5	0	10
6/4/2020	13	0.5		1	1.5	0	10

6/5/2020	13			1	1.5	0	10.5
6/6/2020	11			1	1.5	0	8.5
6/7/2020	11			1	1.5	0	8.5
6/8/2020	9			1	1.5	0	6.5
6/9/2020	9			1		0	8
6/10/2020	10		2.5	1		0	6.5
6/11/2020	10		2.5	1		0	6.5
6/12/2020	10		2.5	1		0	6.5
6/13/2020	10		2.5	1		0	6.5
6/14/2020	10		2.5	1		0	6.5
6/15/2020	10		2.5	1		0	6.5
6/16/2020	10		2.5	1		0	6.5
6/17/2020	10		2.5	1	1.5	0	5
6/18/2020	10			1	1.5	0	7.5
6/19/2020	10			1	1.5	0	7.5
6/20/2020	4			1	1.5	0	1.5
6/21/2020	4			1		0	3
6/22/2020	4			1		0	3
6/23/2020	0					0	0
6/24/2020	0					0	0
6/25/2020	3					0	3
6/26/2020	10			1	1.5	0	7.5
6/27/2020	9			1	1.5	0	6.5
6/28/2020	9			1	1.5	0	6.5
6/29/2020	3			1	1.5	0	0.5
6/30/2020	3					0	3
7/1/2020	3					0	3
7/2/2020	3					0	3
7/3/2020	3					0	3
7/4/2020	3					0	3
7/5/2020	3					0	3
7/6/2020	3					0	3
7/7/2020	3					0	3
7/8/2020	3					0	3
7/9/2020	10				1.5	0	8.5
7/10/2020	10				1.5	0	8.5
7/11/2020	10				1.5	0	8.5
7/12/2020	10				1.5	0	8.5
7/13/2020	11				1.5	0	9.5
7/14/2020	12			1	1.5	0	9.5
7/15/2020	12	0.5		1	1.5	0	9
7/16/2020	12	0.5		1	1.5	0	9
7/17/2020	12	0.5		1	1.5	0	9
7/18/2020	12	0.5		1	1.5	0	9
7/19/2020	12	0.5		1	1.5	0	9
7/20/2020	5	0.5		1	1.5	0	2
7/21/2020	4	0.5		1		0	2.5

7/22/2020	4			1		0	3
7/23/2020	9		2.5	1		0	5.5
7/24/2020	9		2.5	1		0	5.5
7/25/2020	9		2.5	1		0	5.5
7/26/2020	9		2.5	1		0	5.5
7/27/2020	9		2.5	1		0	5.5
7/28/2020	9		2.5	1		0	5.5
7/29/2020	12		2.5	1	1.5	0	7
7/30/2020	12		2.5	1	1.5	0	7
7/31/2020	11	0.5	2.5	1	1.5	0	5.5
8/1/2020	11	0.5	2.5	2		0	6
8/2/2020	11	0.5	2.5	2		0	6
8/3/2020	11	0.5	2.5	2		0	6
8/4/2020	11	0.5		2		0	8.5
8/5/2020	11	0.5		2		0	8.5
8/6/2020	11	0.5		2		0	8.5
8/7/2020	10	0.5		2		0	7.5
8/8/2020	10			2		0	8
8/9/2020	10			2		0	8
8/10/2020	12		1	2		0	9
8/11/2020	12		1			0	11
8/12/2020	12		1			0	11
8/13/2020	12		1			0	11
8/14/2020	12		1		1	0	10
8/15/2020	12				1	0	11
8/16/2020	12				1	0	11
8/17/2020	12				1	0	11
8/18/2020	9			2	1	0	6
8/19/2020	7			2		0	5
8/20/2020	7			1		0	6
8/21/2020	7					0	7
8/22/2020	7					0	7
8/23/2020	7					0	7
8/24/2020	7					0	7
8/25/2020	7					0	7
8/26/2020	4				1	0	3
8/27/2020	4					0	4
8/28/2020	4					0	4
8/29/2020	4					0	4
8/30/2020	4					0	4
8/31/2020	4					0	4

6.83 cfs average

710.5 cfs

1409 acre-feet

LATERAL 11.9 HYDROPOWER CALCUATIONS

Power Estimation for Lateral 11.9 Small Hydropower Project

Power Formula: $P = m \times g \times H_{net} \times \eta$

Where:

P	power, measured in Watts (W).
m	mass flow rate in kg/s (numerically the same as the flow rate in litres/second because 1 litre of water weighs 1 kg)
g	the gravitational constant, which is 9.81 m/s^2 **9.81** m/s^2
H_{net}	the net head. This is the gross head physically measured at the site, less any head losses. To keep things simple head losses can be assumed to be 10%, so Hnet=Hgross x 0.9
η	the product of all of the component efficiencies, which are normally the turbine, drive system and generator

For a typical small hydro system the turbine efficiency would be 85%, drive efficiency 95% and generator efficiency 93%, so the overall system efficiency would be:

Efficiency: **0.85 x 0.95 x 0.93 = 0.751 i.e. 75.1%** **0.751**

MIN Flowrate:	**1800** gpm	=	**4.00** cfs	=	**113.27** l/s	or	kg/s	
MAX Flowrate:	**10350** gpm	=	**23.00** cfs	=	**651.29** l/s	or	kg/s	
AVG Flowrate:	**2925** gpm	=	**6.50** cfs	=	**184.06** l/s	or	kg/s	
MIN Head:	**50** feet	=	**15.24** m	=	**21.6** psi			
MAX Head:	**65** feet	=	**19.812** m	=	**28.1** psi			
AVG Head:	**65** feet	=	**19.812** m	=	**28.1** psi			

MIN H_{net}:	**13.716** m				
MAX H_{net}:	**17.8308** m				
AVG H_{net}:	**17.8308** m				
$Power_{min}$:	**11445.67** W	**11.45** kW	**274.7** kWh/day	**100264.1** kWh/yr	
$Power_{max}$:	**85556.40** W	**85.56** kW	**2053.4** kWh/day	**749474.1** kWh/yr	
$Power_{avg}$:	**24178.98** W	**24.18** kW	**580.3** kWh/day	**211807.9** kWh/yr	

https://www.renewablesfirst.co.uk/hydropower/hydropower-learning-centre/how-much-power-could-i-generate-from-a-hydro-turbine/

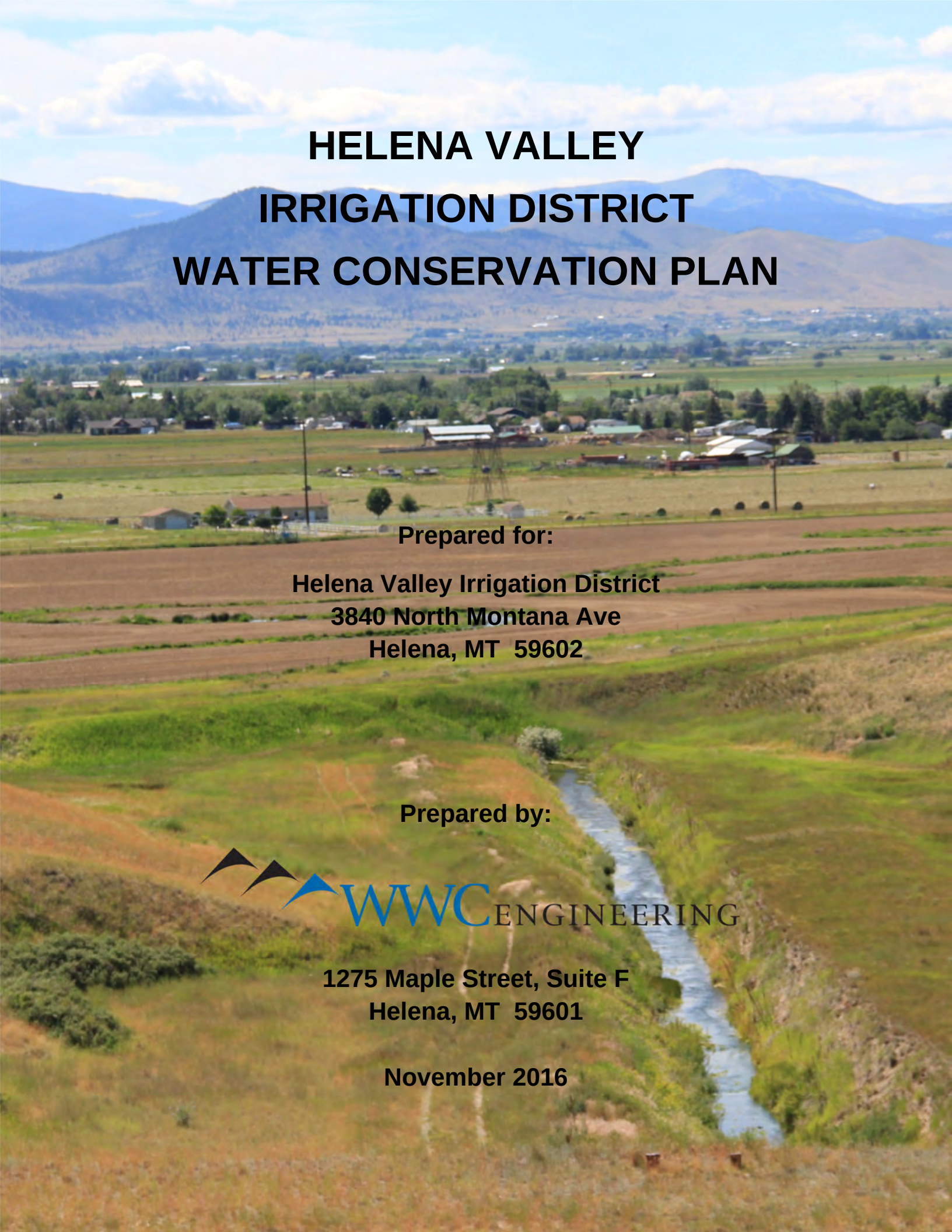
Energy = Power*Time
kWh = kW*h

Off-Peak Purchase Power Rate = $0.053 per KWh
On-Peak Purchase Power Rate = $0.093 per KWh
*** Based on NorthWestern Energy Rates

Estimated Return based on 4 hours On-Peak and 20 hours Off-Peak: $5,298 per year

HVID Irrigation Season Duration: 153 days
Total Annual Electric Generation: 88785 kWh

APPENDIX B
WATER CONSERVATION PLAN EXERPT



HELENA VALLEY
IRRIGATION DISTRICT
WATER CONSERVATION PLAN

Prepared for:

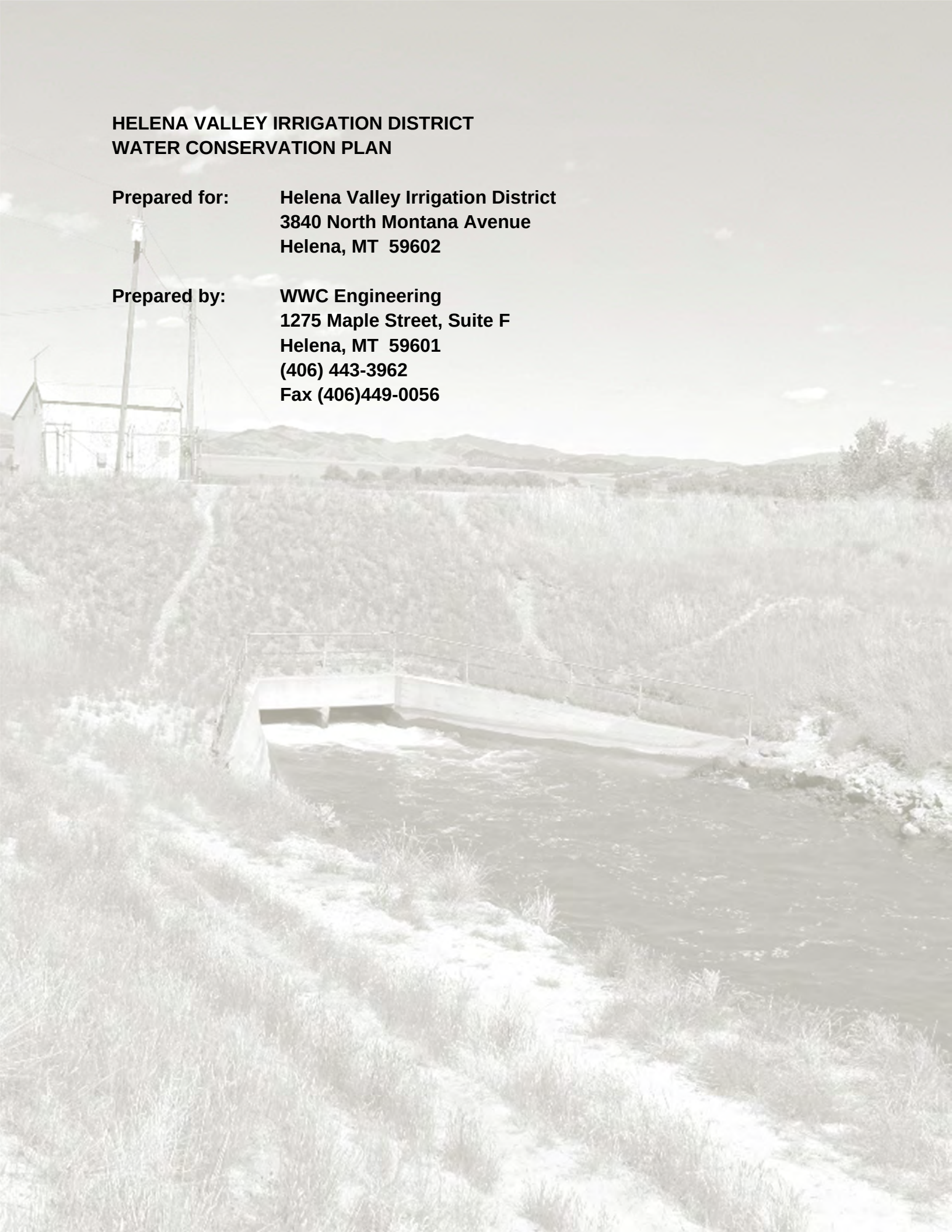
Helena Valley Irrigation District
3840 North Montana Ave
Helena, MT 59602

Prepared by:

WWC ENGINEERING

1275 Maple Street, Suite F
Helena, MT 59601

November 2016



HELENA VALLEY IRRIGATION DISTRICT
WATER CONSERVATION PLAN

Prepared for: **Helena Valley Irrigation District**
3840 North Montana Avenue
Helena, MT 59602

Prepared by: **WWC Engineering**
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APPENDIX

1.0 DESCRIPTION OF THE DISTRICT

1.1 General Description and Location

The Helena Valley Unit of the Pick-Sloan Missouri Basin Program is located in central Montana, approximately 3.5 miles west of Canyon Ferry Dam on the Missouri River. The principal purposes of the unit are irrigation and municipal water for the City of Helena. Features of the unit include a tunnel, dam, regulating reservoir, canal, pumping plant, and other facilities to furnish water to about 17,600 acres and 300 water users, including municipal use by the City of Helena. The Helena Valley Irrigation District's (HVID) system was constructed by the Bureau of Reclamation (BOR) between 1956-1958, and operation and management was transferred to the HVID immediately following construction.

The Helena Valley Unit water supply is discharged from Canyon Ferry Reservoir, 17 miles east of Helena on the Missouri River. The Helena Valley Pumping Plant, located below Canyon Ferry Dam, lifts water by turbine-driven pumps to the Helena Valley Tunnel. Water flows by gravity through the 2.7-mile tunnel under the Spokane Hills into the Helena Valley. From there, the Helena Valley Canal conveys the water around the south, west, and north sides of the valley, terminating through a wasteway into Lake Helena. The Helena Valley Regulating Reservoir, with an active capacity of 5,897 acre-feet, is located at mile 11 of the Helena Valley Canal. This reservoir regulates pumped water and supplies water through a two-level outlet works to the municipal works constructed by the City of Helena.

1.2 History

From 1956 to 1958, the HVID was built in order to reclaim land destroyed or inundated by the backing up of water from Canyon Ferry Dam. The HVID was part of a multi-purpose project that involved the creation of three new irrigation districts; East Bench Irrigation District (Dillon), the Crow Creek Unit (Toston), and the HVID. Between the three irrigation districts enough land was irrigated to partially offset irrigated acres covered by water in Canyon Ferry Reservoir. Over the past several years, the HVID has developed a priority list for the repair and/or rehabilitation of existing components of its irrigation infrastructure in order to conserve water. Previously completed projects on this list have provided significant improvements to the irrigation efficiency and water conservation ability of the system and demonstrate the HVID's committed effort towards conservation of water.

1.3 FEATURES

1.3.1 Helena Valley Pumping Plant

The Helena Valley Pumping Plant, located 500 feet downstream from Canyon Ferry Dam, houses two 3,500-horsepower Francis type hydraulic turbines; each turbine is connected directly to a 150-cubic-foot-per-second centrifugal pump; and the two pumps lift a total of 300 cubic feet per second of water to the inlet end of the Helena Valley Tunnel. Water is supplied to the pumping plant by a 10-foot diameter welded steel penstock pipe from Canyon Ferry Dam. A portion of the water from the reservoir is pumped up to the tunnel through a 75-inch-diameter discharge line; the remainder is discharged into the Missouri River. A 10-foot-long reducer section at the upstream end connects the penstock pipe to the 13-foot diameter conduit liner pipe in Canyon Ferry Dam. A 60-ton fixed-wheel gate in the upstream face of Canyon Ferry Dam regulates the flow of water into the penstock. An exposed manifold provides for future installation of a small power plant. A 92-inch butterfly valve is located in each of the two branches for the turbines.

1.3.2 Helena Valley Tunnel

The Helena Valley Tunnel passes through a high range of hills on the left bank of the Missouri River, approximately 14 miles east of Helena, Montana. The gravity flow tunnel conveys water in a westerly direction through the Spokane Hills which separates the Helena Valley and the Missouri River. The water is pumped into the tunnel from Canyon Ferry Reservoir by two hydraulic turbine-driven pumps. The tunnel is concrete lined, horseshoe shaped, 7 feet in diameter, and 2.7 miles long. The tunnel capacity is 300 cubic feet per second with the water depth at 5.5 feet. The invert at the tunnel inlet end is 73.41 feet above Canyon Ferry Reservoir's maximum water surface elevation and 211.16 feet above the horizontal centerline of the pumps.

1.3.3 Helena Valley Dam, Reservoir, and Canal

Water flowing from the Helena Valley Tunnel at mile 2.8 discharges into the 300-cubic-foot-per-second Helena Valley Canal. The canal is 31.7 miles long, with 10.2 miles unlined and 21.5 miles lined. At mile 11, the canal discharges into a 10,451-acre-foot capacity regulating reservoir known as the Helena Valley Regulating Reservoir. The Helena Valley Dam, which forms the reservoir is an earth fill structure 94 feet high, with a crest length of 2,650 feet with a 600-foot-long dike extending from the left abutment of the dam. The reservoir has 5,897 acre-feet of conservation storage for irrigation and municipal water use by the City of Helena. A 350-cubic-foot-per-second outlet, located in the earthen dam, is used to control the water supply to the Helena Valley Canal and municipal water to the City of Helena. Between the reservoir and mile 17, the canal provides facilities for water delivery service to 10 irrigation ditches which, historically, have been diverting water from Prickly Pear Creek. Between miles 17 and 22, facilities

are provided for service to existing ditches that, historically, have diverted water from Prickly Pear and Tenmile Creeks. These facilities have allowed the HVID to enter into an agreement with the Clark Fork Coalition to augment stream flows within Prickly Pear Creek. In doing so, the HVID conserves water for Prickly Pear Creek that would otherwise be used for irrigation purposes. The canal terminates at Lake Helena, which occupies the lower part of the valley approximately 2.6 miles east of the intersection of Interstate 15 and Lincoln Road.

1.3.4 Lateral and Drainage System

A complex system of laterals and drains is used to convey water from the main canal to irrigation users throughout the Helena Valley. The lateral system is 64.8 miles long, which includes 51.9 miles of unlined channel, 12.7 miles of lined channel, and 0.2 mile of pipe. The laterals mostly stem off of the main canal and generally convey water north towards Lake Helena. The drainage system is 56.5 miles long, including 26.6 miles of open drains and 29.9 miles of pipe drains.

1.3.5 Operations

Operation and maintenance functions are performed by the Helena Valley Irrigation District. Operation and maintenance procedures for the irrigation district includes operating and maintaining all the irrigation infrastructure described previously, completing new projects when necessary, regulating and monitoring water use and delivery, record keeping, coordinating with City of Helena and other major water users, among many other duties. The HVID was formed in 1958 and was designed to reclaim land that was destroyed or inundated by the backing up of water from Canyon Ferry Dam. The HVID operates in accordance with Montana Code Annotated Title 85, Chapter 7; and HVID policies. The HVID staff consists of four members; a manager, office manager, and two ditch riders. The HVID's Board of Commissioners is comprised of five elected Board members which, defined by state statute, is the legal governing body of the District. The HVID is broken into five Divisions, and each elected Commissioner represents one of those Divisions. The HVID is funded through annual assessments, currently assessed at a rate of $18.10 per acre.

1.4 CLIMATE

Helena’s weather is usually clear, sunny, and dry; with low humidity levels making both summer and winter temperatures more comfortable. Because Helena is on the “dry side” of the Continental Divide, there are generally sunnier days here than west of the Divide. Warming periods between snowfalls prevent heavy accumulations, and valley snow depths rarely exceed five or six inches. The Western Regional Climate Center (WRCC) data for Helena, MT shows that the area experiences a total average annual

precipitation of 11.90 inches, an average maximum temperature of 55.4 degrees Fahrenheit, and an average minimum temperature of 32.3 degrees Fahrenheit.

1.5 Topography

The elevation at the Helena Regional Airport, which is located near the southern boundary of the HVID, is 3,873 feet above mean sea level. Most of the land within the District is located on the valley floor with only minor undulations present. Most of the irrigable lands are irrigated using surface application methods such as center pivots or wheel lines.

1.6 Soils

Soils within the Helena Valley vary slightly throughout the irrigable lands within the HVID. Generally, the soils consist of various types of loams, from silty loams to more cobbly, or gravelly loams. Using the Natural Resources Conservation Service's Web Soil Survey, a soil map for the Helena Valley was created and is included in Appendix A. Additionally, a water management report that focuses on irrigation, both general and sprinkler, is included in Appendix A. Generally, the soils within the HVID do not have limitations or are only somewhat limited for flood and sprinkler irrigation, a practice that is very popular within the District.

1.7 Water User Information

The HVID currently serves approximately 300 water users throughout the Helena Valley and approximately 18,000 irrigable acres. Included in those users are special water projects such as water for waterfowl nesting, irrigation water for the Seibel Soccer Complex, wetland habitat, conservation of in-stream flows for Prickly Pear Creek, as well as providing municipal water for the City of Helena. The HVID diverts approximately 85,000 acre-feet of water annually for all these users. The Helena Valley Regulating Reservoir allows the HVID to adequately meet the demands of all HVID users by providing over 10,000 acre-feet of storage capacity that acts as a buffer to meet system demand. This reservoir ensures consistent water delivery to each user throughout the irrigation season.

1.8 Crop Distribution

According to the 2014-2015 HVID Crop Report, 7,065 acres within the HVID utilize sprinkler irrigation methods while 1,149 acres use flood irrigation techniques. The cropland in the HVID consists of several crops including hay, alfalfa, wheat, barley, and oats. As of 2014-2015, there are 4,723 acres in hay production, 2,012 acres in alfalfa production, 100 acres in wheat production, 174 acres in barley production, 19 acres in

oat production, 767 acres of pasture, and 419 acres are idle. The crop reports for 1999, 2005, and 2014 are included in Appendix B. Table 1 depicts the primary HVID crops over time.

Table 1. Crop Changes Over Time

Year	Total Acres Reporting	Pasture	Hay	Alfalfa	Wheat	Barley	Oats	Idle Acres
1999	15,924	2,597	231	11,309	434	647	57	650
2005	17,232	2,479	2,355	8,611	740	271	56	2,720
2014*	8,214	767	4,723	2,012	100	174	19	419

*The HVID stopped mandatory crop reporting in 2005, therefore the 2014 data is only reflective of approximately 46% of all irrigable acres within the District. In 2014, approximately 9,786 acres were unreported.

2.0 INVENTORY OF WATER RESOURCES

2.1 SURFACE WATER SUPPLY

The HVID includes approximately 18,000 acres of irrigated lands receiving water from the Missouri River near the Canyon Ferry Dam. Two pumps within the pump station on the downstream side of the dam can pump 360 cfs of water into a canal that conveys water to the Helena Valley Regulating Reservoir. The reservoir has a 10,000-acre-foot capacity that can be used as a regulating facility during times of high water demand or during drought conditions.

2.2 WATER RIGHTS

The HVID owns a water right for up to 22,235.3 acres of land, 18,111.6 acres located within the HVID boundary and 4,123.7 acres located outside the boundary. Currently, the HVID is using this water right to serve approximately 18,000 acres of irrigable lands. The priority date for this water right is March 17, 1959. The HVID operates under a single water right that has multiple uses including power generation, irrigation, stock water, domestic, fish and wildlife, and recreation. The use of this water right for several purposes does not increase the extent of the water right, rather it decrees the right to alternate and exchange the use (purpose) of the water in accord with historical practices. Appendix C includes the water rights data obtained from the Department of Natural Resources and Conservation's Water Right Query System.

3.0 HVID WATER BUDGET

The HVID utilizes several measuring locations throughout their system and portable flow measuring devices carried by the ditch riders in order to collect flow data.

Additionally, the District employs two ditch riders that are tasked with collecting data and ensuring water delivery to the users of the HVID system. The HVID makes a constant effort to continually improve flow data collection. The following sections will describe this data and how it correlates with the water budget analysis.

3.1 Water Budget Data

The HVID's water budget is based on measurements taken at the inlet and outlet of the Helena Valley Regulating Reservoir as well as at lateral turnouts throughout the District. Other factors for the water budget include the net water supply, operational spills, transportation losses such as seepage or evapotranspiration, and individual deliveries. Since 2005, the HVID has collected data at these locations in order to better understand their water delivery system and improve water conservation throughout the District. The water measurement program includes using portable flow meter equipment to measure flows within the main canal, inflows into the reservoir, and outflows from the reservoir. Individual farm turnout deliveries are measured at the turnout using these same portable flow meters that are carried by the HVID ditch riders. Additionally, losses within the system are based on the HVID's best estimates from years of data collection and experience. Table 2 shows the total water diverted into the Helena Valley Canal from 2005 – 2015.

Table 2. Diverted Water to the Main Canal at the Helena Valley Regulating Reservoir Outlet Works

Irrigation Season	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005				3334	11924	12070	17318	19788	13350			
2006				5538	15240	12291	21266	19305	12687			
2007				4756	12980	11261	17429	13326	10669			
2008					11789	13964	16213	22436	14962			
2009				2538	11759	16647	15947	16532	8477			
2010			2060	2360	11018	9984	13905	14678	8670			
2011				3438	11335	7698	14617	20546	14698			
2012					15305	14966	17345	18321	12844			
2013				3974	19306	12057	16927	15797	15041			
2014				2021	14656	14656	20474	17942	10351			
2015				3868	16040	17090	19730	18180	12150			

*All data in acre-feet

3.2 Water Budget Analysis

The HVID ditch riders are responsible for all water measurements. The ditch riders take measurements at the reservoir inlet and outlet, various locations throughout the main

canal, at each lateral, and at each turnout. Landowners are responsible for keeping track of their water usage and reporting it to the HVID each irrigation season. Data has been collected for the last ten years in order to gain a better understanding of the water delivery system and to improve water conservation for the HVID and its users. The following tables and graphs illustrate the water delivery and water usage data for the past ten years in the HVID system.

Chart 1. Reservoir Outlet Works Annual Discharge (Acre-Feet)

Chart 1 illustrates the amount of water discharged from the Helena Valley Regulating Reservoir into the Helena Valley Canal for delivery to the users of the HVID system. Data from the HVID's records was used for this chart.

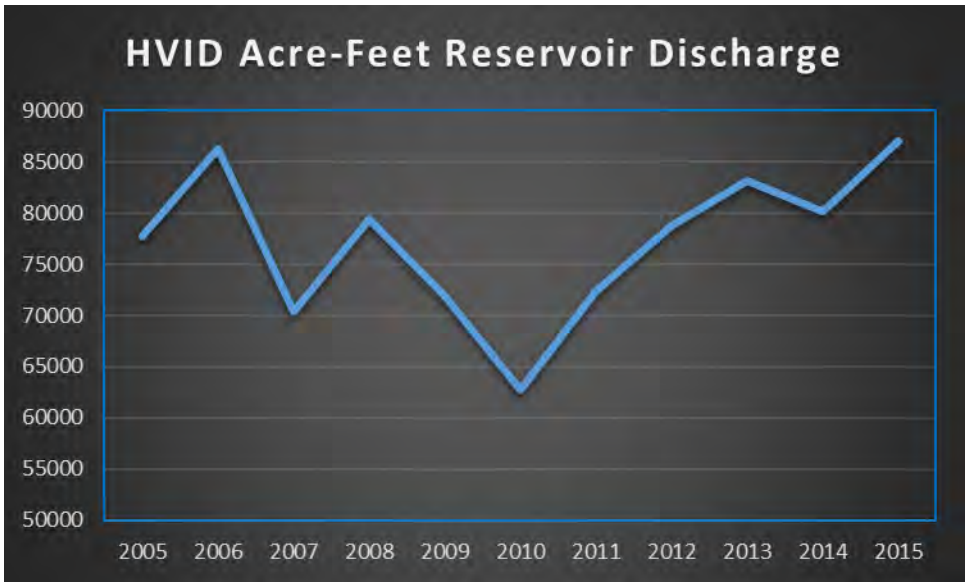


Chart 2. HVID Water Delivered (Acre-Feet)

Chart 2 illustrates the amount of water delivered to the users of the HVID system in a year. Water records from the HVID were used to create this chart.

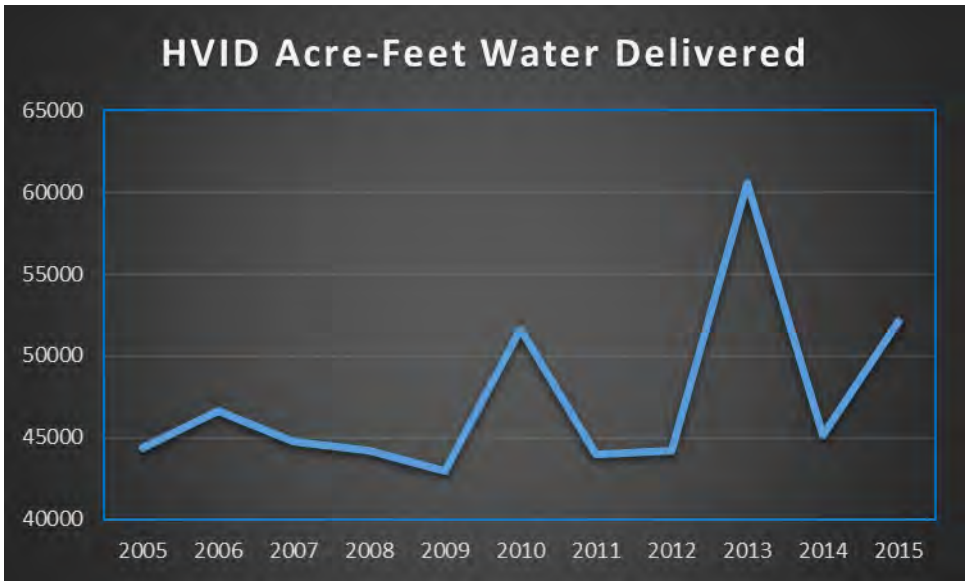
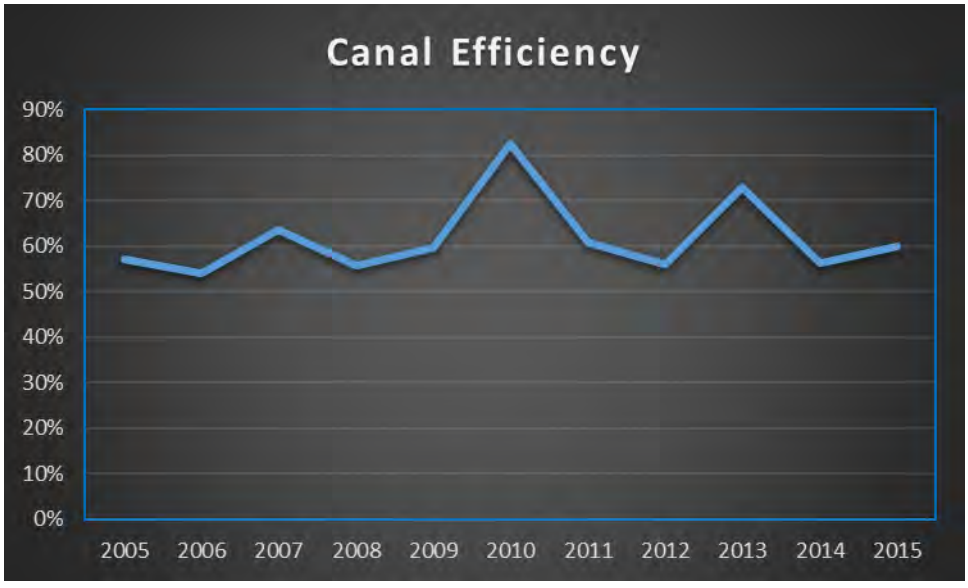


Chart 3. Canal Delivery Efficiency

Chart 3 plots the annual canal delivery efficiency. Canal efficiency was calculated by dividing the delivered water by the amount of water discharged from the Helena Valley Regulating Reservoir.



4.0 PAST AND EXISTING WATER CONSERVATION MEASURES

The HVID has completed several projects in the past that have helped the District conserve and manage water within their system. Projects have included several

canal/lateral linings, pipeline conversions, and development of water conservation plans. The HVID Main Canal currently includes 21.5 miles of lined canal. The total canal length is 31.7 miles long, making 67.8% of the canal lined in order to combat seepage related losses and improve water conservation. Similarly, the laterals within the HVID include 12.7 miles of either lined channel or pipeline. The following is a list of past HVID projects that demonstrate the HVID's commitment to better water conservation. Table 3 includes a list of water conservation specific projects that have been completed by the HVID and Appendix D includes photos of infrastructure throughout the District.

4.1 1988 Water Conservation Plan

In 1988, the HVID developed a Water Conservation Plan as part of their newly developed Water Conservation Program. The objective of the program was to improve utilization of water within the District through water conservation, water management, and improved water data collection.

4.2 2000 Water Conservation Plan

In 2000, the HVID updated their Water Conservation Plan to include updated objectives and goals. The plan was updated to better reflect the changing long-term goals and planning ideas in order to improve the overall water use of the District.

4.3 2010 Main Canal Lining Project

In 2010, the HVID completed a lining project for approximately 2,100 linear feet of the HVID Main Canal. The project involved grading approximately 4,315 linear feet of the HVID Main Canal to the desired canal dimensions and installing Huesker Canal^3 liner along 2,100 linear feet of the canal. This project demonstrates the HVID's commitment towards water conservation and management.

Table 3. Completed System Improvements

Year	Project	Task	Results
Completed Canal/Lateral Water Savings Projects			
2014	Lateral 10.1 Lining	Lined 1,320' of lateral	Eliminated seepage related losses and erosion
2013	Lateral 20.7 Lining	Lined 1,320' of lateral	Eliminated seepage related losses and erosion
2008	Helena Valley Main Canal Lining	Lined (2,100') and graded (4,315') the Main Canal	Eliminated seepage related losses and erosion
Infrastructure Replacement or Repair Projects			
2016	Lateral 27.8 Check Structure Replacement	Replaced check structure due to aging	Eliminated potential failure
2016	Lateral 27.8 Check Structure Repair	Fixed damaged check structure	Preserved service life of the structure
2015	Lateral 10.1 Turnout Repair	Fixed damaged turnout	Preserved service life of the structure
2015	Lateral 10.1 Check Structure Repair	Repaired damaged and worn check structure	Preserved service life of the structure
2015	Lateral 20.7 Drop Structure Repair	Fixed damaged drop structure	Preserved service life of the structure
2016	Lateral 9.2 Check Structure Repair	Fixed damaged check structure	Preserved service life of the structure
2016	Lateral 6.3 Repair	Repaired wash out within Lateral 6.3	Eliminated erosion and preserved service life of the lateral

5.0 WATER MANAGEMENT PROBLEMS AND OPPORTUNITIES

5.1 WATER MEASUREMENT AND ACCOUNTING

Problem: During the busy irrigation season, ditch riders sometimes are unable to completely measure water within the system, making it very difficult to get an accurate representation of water use and delivery. All flow measurements are taken with portable flow meters that the ditch riders carry with them.

Opportunity: Install additional water measurement equipment at critical points within the system.

5.2 SEEPAGE

Problem: Main canals and laterals experience significant losses due to seepage that reduces the efficiency of HVID's water delivery system. Seepage could also cause loss of productive farmland and may have an impact on downstream water quality.

Opportunity: Install pipelines and/or line the canals and laterals that show signs of seepage or are in areas where the soils are well-drained and promote seepage. By lining or converting to pipeline, water delivery efficiency will improve and farmland can remain productive.

5.3 Deteriorating Infrastructure

Problem: Old and deteriorating structures within the HVID system are coming close to reaching their design life and could use repair or replacement. Technology has improved since the installation of some of these structures that could help improve water delivery and distribution. With modernization of agriculture practices the delivery system needs to adapt as well.

Opportunity: Assess and prioritize infrastructure improvements in order to complete projects that will provide the maximum improvement to the water delivery and distribution system.

5.4 Water Quality

Problem: Water management within the HVID system has an impact on the water quality of both the Helena Valley Regulating Reservoir and Lake Helena.

Opportunity: The HVID has an opportunity to implement projects that will improve water management and water conservation. As a result of these projects, water quality issues can be minimized for the benefit of all HVID users. Improved water quality through implementation of water conservation projects such as linings and pipelines will benefit fisheries, recreation, and drinking water.

5.5 Noxious Weeds

Problem: Noxious weeds have a negative effect on the HVID system in many ways including high costs to control weeds, farmland production, and streambank erosion. Noxious weeds can spread to irrigated cropland through the waterway, therefore, causing significant financial losses to agricultural production.

Opportunity: Partnering with HVID landowners and/or putting a weed management program in place that will help manage noxious weeds.

6.0 SHORT-TERM AND LONG-TERM GOALS

6.1 5-YEAR GOALS

Goal 1: *Improve conveyance efficiency by 20% to address HVID system capacity, maintenance issues and costs, timeliness of deliveries, water measurement, and water management*.

- **Objective 1: Fund or seek financial assistance for water conservation projects such as canal linings, pipeline conversions, infrastructure improvements, or infrastructure assessments.**
- **Objective 2: Evaluate and establish effective water delivery methods and improve wherever possible.**
- **Objective 3: Improve the water measurement program to adequately monitor flows within all parts of the HVID system.**
- **Objective 4: Reduce waste water.**
- **Objective 5: Maintain existing infrastructure in a useful condition.**

Goal 2: *Improve on-farm efficiencies.*

- **Objective 1: Increase water user education within the next five years and encourage more efficient irrigation practices.**

Goal 3: *Improve water management and operations.*

- **Objective 1: Increase the amount of flow data collected every year for the next five years.**
- **Objective 2: Improve water data collection equipment within the next five years or install permanent measuring devices at critical points throughout the HVID system. The HVID is currently seeking a Department of Natural Resources and Conservation grant to fund the implementation of a Supervisory Control and Data Acquisition (SCADA) system at the outlet of the regulating reservoir.**

6.2 LONG-TERM GOALS

The long-term goal of the HVID is to improve water management and water delivery into the foreseeable future through improved efficiencies, both on-farm and within the delivery system so that the HVID can ensure an adequate water supply to meet the needs of the irrigators in a cost-effective way.

7.0 EVALUATION OF CONSERVATION MEASURES

The following breaks down the HVID's tasks that will be necessary to improve water conservation within the water delivery system:

7.1 WATER MEASUREMENT

Description: Install water measuring devices at critical points throughout the delivery system. Improve water measurement at all farm turnouts. Implement a SCADA system at the Helena Valley Regulating Reservoir Outlet Works in order to more efficiently manage the HVID system and improve water measurements. A study of the canal and lateral distribution system will be completed to evaluate the feasibility of installing water measurement devices to record water distribution among the canals and laterals. Installation of measuring devices will be completed on a priority basis. The study will be completed as soon as funding becomes available.

Legal and Institutional Considerations: None

Environmental Considerations: None

7.2 IMPROVE CONVEYANCE EFFICIENCY

Description: An evaluation of the conveyance system will be necessary in order to determine which areas of the conveyance system experience the most significant water losses and can be improved through the implementation of water conservation projects such as canal/lateral linings and pipeline conversions. Conveyance system improvement projects will be accomplished on a priority basis and as funding becomes available.

Legal and Institutional Considerations: Each project will need to be evaluated on its own merits.

Environmental Considerations: Each project will need to be evaluated with respect to its environmental impacts.

7.3 GIS MANAGEMENT

Description: Develop a GIS system that will allow the HVID to better manage the overall distribution system. A GIS program will provide the HVID with a centralized information system that can keep track of all data within the HVID system.

Legal and Institutional Considerations: None.

Environmental Considerations: None.

7.4 INFRASTRUCTURE MAINTENANCE

Description: Maintain existing infrastructure in working order. Maintenance projects will be completed on a priority basis.

Legal and Institutional Considerations: Review with each project.

Environmental Considerations: Review with each project.

7.5 EDUCATION

Description: Educate ditch riders on effective water management and improved irrigation delivery efficiency through workshops and other trainings. Educate the HVID Board of Directors on the benefits of effective water management and conservation through workshops and other trainings. Additionally, education for water users regarding their role in water management and how to improve on-farm irrigation efficiency. The HVID will utilize training assistance from institutions such as the NRCS to help find ways to improve irrigation efficiency.

Legal and Institutional Considerations: None.

Environmental Considerations: None.

8.0 ADOPTED PLAN ELEMENTS

Most of the adopted plan elements include the continuation of current water conservation measures. The Water Conservation Plan will provide the HVID with a blueprint to achieve improved water management, water conservation, improved water delivery efficiency, and on-farm efficiencies.

8.1 WATER MEASUREMENT

Install water measuring devices at critical points throughout the delivery system in order to better understand water delivery. Currently, the HVID is seeking DNRC grant funding in order to implement a SCADA system at the outlet of the regulating reservoir. The HVID plans to expand on this project to create a SCADA network of their entire

distribution system. SCADA will maximize the management capabilities of the HVID by providing real-time data within a user-friendly platform. Once one SCADA system is installed, others can be linked together to create one, centralized network of data collection and infrastructure control.

8.2 Improve Conveyance Efficiency

Several conveyance system improvements can be made throughout the HVID system in order to improve delivery efficiency. Projects such as canal/lateral linings, pipeline conversions, infrastructure improvements, etc. will help improve efficiency by eliminating water losses and improving management of the system.

8.3 GIS Management

Develop a GIS system that will allow the HVID to better manage the overall distribution system from one centralized information system.

8.4 Infrastructure Maintenance

Maintain existing infrastructure in working order. Repair or replace any infrastructure that has surpassed its service life.

8.5 Education

Educate ditch riders on effective water management and improved irrigation delivery efficiency through workshops and other trainings. Educate the HVID Board of Directors on the benefits of effective water management and conservation through workshops and other trainings. Additionally, provide education for water users regarding their role in water management and how to improve on-farm irrigation efficiency. The HVID will utilize training assistance from institutions such as the NRCS to help find ways to improve irrigation efficiency.

9.0 IMPLEMENTATION SCHEDULE AND BUDGET

Table 4. Implementation Schedule and Budget

Adopted Measure	2016	2017	2018	2019	2020	2021	Funding Source
O&M Projects							
Annual Canal Shaping	$5,000	$5,150	$5,305	$5,464	$5,628	$5,796	HVID
Annual Weed Management	$1,000	$1,030	$1,061	$1,093	$1,126	$1,159	HVID
Infrastructure Maintenance	$5,000	$5,150	$5,305	$5,464	$5,628	$5,796	HVID
Specialized Projects							
Regulating Reservoir SCADA System		$157,030					DNRC Grant/HVID
Totals	**$11,000**	**$168,360**	**$11,670**	**$12,020**	**$12,381**	**$12,752**	

10.0 WATER CONSERVATION PLAN MONITORING AND APPROVAL

The Helena Valley Irrigation District will strive to achieve the goals of this Water Conservation Plan. The District will continue to monitor the plan and update any information, as necessary. The Helena Valley Irrigation District Board of Commissioners hereby adopt this Water Conservation Plan on 13th Day of December, 2016.

John F Baucus, President

Mark T. Diehl, Vice President

Thomas E. Nicholls, Commissioner

Craig Winterburn, Commissioner

Donald L. Burnham, Commissioner

APPENDIX C
HVID COMMITMENT LETTER

Helena Valley Irrigation District

3840 North Montana Avenue, Helena, MT 59602 (406) 442-3292
sharonfoster@hvid-mt.com Web Site: hvid-mt.com

September 3, 2020

To Whom It May Concern:

The Helena Valley Irrigation District (HVID) wished to confirm our commitment of in-kind and/or cash match funding for the Lateral 11.9 Pipeline Conversion Project should our application to the Bureau of Reclamation's WaterSMART Grant Program be successful.

HVID acknowledges our commitment to fund the amount of $481,761 to the project in the form of cash, labor, equipment, and management necessary to complete the project. The HVID agrees that upon the successful award of the WaterSMART grant we will make available the pledged resources in the form of cash, labor, equipment, and management necessary to fulfill our funding obligation as soon as it is feasible for the project to begin.

Neither the Management nor the Commissioners of the HVID foresee any time constraints, contingencies or conditions that may interfere with our fulfillment or our contribution obligations under the terms outlined in the grant application.

Sincerely,

SHARON K. FOSTER, OFFICE MANAGER
HELENA VALLEY IRRIGATION DISTRICT

APPENDIX D
LETTERS OF SUPPORT

LEWIS & CLARK CONSERVATION DISTRICT
790 Colleen Street • Helena, Montana 59601 • 449-5000 ext 5

September 15, 2020

USBOR

RE: USBR WaterSmart Funding for Helena Valley Irrigation District (HVID)

To Whom It Concerns;

The Lewis & Clark Conservation District Board of Supervisors would like to convey their support for the HVID Lateral 11.9 Pipeline Conversion Project.

The projected water savings of 75% is significant and has been identified by the HVID as a top priority. Canal seepage has been an ongoing problem for neighbors, flooding crawlspaces and basements.

If you have further questions, please contact us at 406-449-5000 ext. 5 or via email at chris@lewisandclarkcd.org.

Sincerely,

LEWIS AND CLARK CONSERVATION DISTRICT

Chris Evans
District Administrator

APPENDIX E
RESOLUTION

HELENA VALLEY IRRIGATION DISTRICT
RESOLUTION
Resolution - HVID, 2020-02
September 1, 2020

WHEREAS; the Helena Valley Irrigation District has the legal authority to enter into an agreement, and intends to submit a Water Efficiency Grant to the United States Bureau of Reclamation's (USBR) WaterSMART Program in 2020, and;

WHEREAS; the Helena Valley Irrigation District, located in Helena, Montana commits to assisting in the funding of, implementation of, the construction of, operation of, and to performing the future maintenance for the proposed Lateral 11.9 Pipeline Conversion Project per the stipulations of the foregoing grant application (if successful and awarded), and;

WHEREAS; the Helena Valley Irrigation District contributions of cash and in-kind management, labor, and equipment services for the preferred alternative of the aforementioned grant application have been estimated at up to 51% of the total projects per the budgeting calculation forms included in the WaterSMART Grant Application, and;

WHEREAS; the Helena Valley Irrigation District hereby appoints Jim Foster, HVID Manager, as the official with legal authority to enter into an agreement (if successful and awarded);

THEREFORE, BE IT RESOLVED: The Helena Valley Irrigation Commissioners support the application and herby commits to the supply of in-kind labor, management, equipment, and/or cash to satisfy the required match as stipulated in the Funding Plan of the WaterSMART Grant Application submittal for the Lateral 11.9 Pipeline Conversion Project. The Helena Valley Irrigation District has budgeted for the planned capital and resource expenditures and will work with Reclamation to meet the established deadlines for entering into a grant or cooperative agreement.

COMMISSIONERS:

JOHN F. BAUCUS, PRESIDENT — September 1, 2020

MARK T. DIEHL, VICE-PRESIDENT — September 1, 2020

GARY BURNHAM — September 1, 2020

THOMAS E. NICHOLLS — September 1, 2020

CRAIG WINTERBURN — September 1, 2020

ATTEST:

JAMES A. FOSTER, SECRETARY — September 1, 2020