

5. Narrative Descriptions (EFN: 723_Narrative.pdf)

Ash Valley Ranch Irrigation Infrastructure Efficiency Project

a. Detailed Project Description

Project Description including Goals/Results Scope of Work, Location, Purpose

The goals/results of the project are to use SNC funds to provide public benefits including the reduction of soil erosion and sedimentation, conservation of ground and surface water and the reduction of energy consumption and greenhouse gas emissions. The project will also assist in maintaining important seasonal wildlife habitat and support the long-term ecological values and economic viability of Ash Valley Ranch and the health of its watershed.

The scope of work includes two main components: 1) the replacement of an inefficient ditch water delivery system with a pvc pipeline delivery system, and; 2) the replacement of two inefficient antiquated diesel pump motors with efficient electric motors. The SNC cap of \$350,000 will not complete the entire project. However, the SNC funded portions of the project will be operative on their own and meet the goals and objectives for the SNC funded completed portions of the project. Other partners are being sought to provide the remaining funds and SNC participation is seen as critical in that effort.

Project location is the eastern portion of Ash Valley, Lassen County, California

The Project purpose is to support the long-term ecological values and economic viability of Ash Valley Ranch agricultural lands and the health of its associated watersheds through the reduction of soil erosion and sedimentation, the conservation of ground and surface water and reduction of energy consumption and greenhouse gas emissions.

Project Summary

The proposed project is located on the Ash Valley Ranch, a cattle operation southeast of Adin, California. The project proposal involves upgrading two diesel pumps currently installed in agricultural wells to electric pumps and the replacement of an old inefficient ditch water delivery system with a state of the art piped delivery system. This will require running an electrical line underground for 1 ½ miles from an existing power line in order to get power to the two new electric pump locations. The antiquated water delivery system currently loses large amounts of water due to seepage. The water from the wells has been used for over a half a century to irrigate a native grassland/wetland pasture that is grazed by ranch livestock and provides a high quality seasonal resource for an abundance of wildlife species.

Project Objectives/Outcomes

- Assist in restoring the Region's physical and living resources
- Aid in the preservation of working landscapes

- Conserve water resources
- Reduce Green House Gases
- Reduce soil erosion and sedimentation
- Protect and enhance habitat for sensitive wildlife and plant species
- Assist the Regional economy

Environmental Setting and Impacts

The project is located on the Ash Valley Ranch, a cattle ranching operation in Lassen County near Adin, CA in Northeastern California. The project area is located in the southeast corner of Ash Valley at 5,000 feet elevation and is within the Holbrook watershed which is part of the Pit River hydrologic unit flowing west toward the Central Valley Region of California. Two soil types are primarily present within the project area, Lakeview loam (264) and Smoke Creek Silty Clay loam (363), which are represented by the Loamy Bottom 9-16" Ecological Site Description which is primarily composed of Basin wildrye (*Leymus cinereus*) (60%) and Basin big sagebrush (*Artemisia tridentata* ssp *tridentata*) (5%) with other meadow grasses and forbs. Wildlife species of importance include sandhill cranes, deer, game birds, raptors, pronghorn, numerous waterfowl, and many other species.

The combination of antiquated diesel pumping plants and inefficient and seeping water delivery systems results in increased energy consumption to pump additional water. This project will result in an increase in water use efficiency by reducing water loss and a decrease in energy consumption because less water will need to be pumped and the new electric pumps will be much more efficient than the antiquated diesel pumps. In addition, by converting the well pumps from diesel to electric, the project will result in a significant reduction in Greenhouse Gas (GHG) emissions and significant reduction in cost to operate the Ash Valley Ranch cattle operation.

The main irrigation ditch is two miles long. Rough estimates based on the soils present in the project location are that 25% of the water being pumped into the irrigation ditch is being lost through percolation and evaporation. Piping of this water would reduce water loss, thereby reducing the amount of water that needs to be pumped, resulting in energy and water conservation and reduced GHG emissions.

In addition, significant benefits to water quality will be achieved. Water tends to stagnate in irrigation ditches resulting in a reduction of dissolved oxygen and increased temperatures. Water in ditches attracts livestock, which trample the ditches adding sedimentation and fecal matter to the water stream. A piping system will reduce these impacts resulting in better quality water reaching the meadow/pasture system.

b. Workplan and Schedule

A project construction plan has been completed, including quantities and estimated costs. Contactor solicitation will commence upon grant execution. Contracts will be let for the new pumps and their installation and for the pipeline construction. Our priorities

for pipeline installation, taking in to account the project bids will be: 1) diesel pump replacements; 2) the north/south mainline; 3) the east west mainline; 4) extensions to the mainline. Project work on these phases of the project needs to be conducted in October-December when the irrigation season concludes and soils are drier.

The extension of the electric lines to the pumps will begin in mid-summer. Lines are being placed underground with the landowner providing an in-kind donation of the trench digging and backfilling. The electrical extension work will be performed by the local Rural Electrical Association/Utility Company, Surprise Valley Electric. They have provided us with a quote for the work and the price is included in our budget.

The pre and post water pumping/flow monitoring will occur during the irrigation season before the project is started and after the work is completed.

Months (Assumes April 2013 Start-up)	1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18	19	20	
Workplan Table																				
Project layout		■																		
Prepare bid solicitations		■																		
Setup photo monitoring points (pre-construction)			■	■	■															
Contractor selection				■	■	■														
Electrical line extension					■	■	■	■												
Diesel pump replacement									■											
Pipeline Construction									■	■										
Pump production monitoring					■	■													■	
Photo monitoring				■															■	
Month 6 progress report								■												
Month 12 progress report													■							
Prepare completed installation GIS files																				■
Final progress report and closeout																				■

c. Restrictions, Technical/Environmental Documents and Agreements

No extraordinary restrictions have been placed on this project. A Conservation and Stewardship Plan has been developed for the Ash Valley Ranch which includes several studies analyzing potential environmental and cultural impacts of implementing the proposed project. Environmental studies include a synopsis of potential project impacts on federal and state listed wildlife and plant species, U.S. Forest Service and California wildlife species of special concern, and plant species on the California Native Plant Society Inventory of Rare and Endangered Plants of California. The Genesis Society has conducted a Class III Archaeological Survey covering the project area. Back-up documentation of environmental compliance is provided on the Full Application submittal CD in EFN 723_CEQA_NEPA_SupportDocs.pdf

California Environmental Quality Act (CEQA):

The project is exempt from CEQA per Article 19: Categorical Exclusions, Section 15304: Minor Alterations to the Land

The Pit Resource Conservation District staff and its Board of Directors have reviewed the proposed project environmental analysis and determined that it is exempt from the California Environmental Quality Act under Section 15304 of the Guidelines, which exempts minor alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes. The Pit RCD filed a Notice of Exemption with the Lassen County Clerk (see attached Notice). Back-up documentation of environmental compliance is provided on the Full Application submittal CD in EFN 723_CEQA_NEPA_SupportDocs.pdf

National Environmental Policy Act (NEPA):

Project is not subject to NEPA.

d. Organizational Capacity

Pit RCD employs a Business Manager who handles their day-to-day activities and also serves as bookkeeper. All other work is furnished by independent contractors, including a Watershed Coordinator and a Project Director who manages terrestrial projects. The Pit RCD also contracts for Registered Professional Forester Services, Biological and Botanical services (including monitoring) and Cultural Resource/Archaeological services. All contracted staff work closely together to successfully implement Pit RCD projects.

The majority of the project work will be accomplished by a Licensed Contractor who will be hired through a competitive bidding process.

The Pit RCD has implemented a wide variety of projects and it is not unusual for the organization to annually manage over \$1 million in project funding. The Pit RCD has conducted Western Juniper reduction on over 10,000 acres in Lassen & Modoc Counties over the last 10 years. The RCD has successfully completed and managed several SNC funded projects. In 2010, a 3.5 million dollar NRCS Conservation Innovative Grant was successfully completed resulting in the restoration of over 4,000 acres of sagebrush steppe. The Pit RCD is in the final year of our 2.8 million dollar NRCS Cooperative Conservation Partnership Initiative (CCPI) resulting in the restoration of an additional 4,000 acres of sagebrush steppe, eastside pine, and riparian habitat. The Pit RCD has completed all projects on time and within budget. In summary, PRCD has the expertise and capacity to complete the Ash Valley Ranch Irrigation Infrastructure Efficiency Project.

e. Cooperation and Community Support

The Lassen County Board of Supervisors and the Natural Resource Conservation Service (NRCS) have both provided letters of support for this project. The project aims to reduce air pollution from diesel exhaust, conserve water, and reduce greenhouse gas emissions. As such, the project meets many of the community goals outlined within the Upper Pit River Watershed Management Strategy developed by the Pit River Watershed Alliance for which the Pit RCD is a member.

f. Long-Term Management and Sustainability

In their current condition, the ditches that deliver water to the Ash Valley Ranch meadow system within the project area require on-going maintenance to remove sedimentation and weedy species to ensure that the network performs properly. With a piping system, this maintenance and loss of water and function will be eliminated therefore creating a more manageable, sustainable, and reliable water delivery system.

Reduced water loss will result in less pumping within the wells which will sustain the life of the pumps.

Improved agricultural practices have great potential to increase the amount of carbon (C) sequestered in cropland soils and to mitigate carbon dioxide (CO₂) emission effects on climate change (Lal et al 1999). Climate change refers to long-term alterations in temperature, precipitation, wind, and other elements of the Earth's climate system. The climate system is influenced by the concentrations of various atmospheric gases, some of which contribute to the phenomenon of global warming. These gases are called "greenhouse gases" (GHGs). GHG's can absorb heat and restrict absorbed heat from reflecting back to outer space. Since the 1750s, the concentrations of three naturally occurring GHGs: water vapor (CO₂); methane (CH₄); and Nitrous oxide (N₂O) in the atmosphere have increased by 30, 145, and 13% respectively (Follett 2001). Agricultural activities contribute to CO₂ emissions to the atmosphere from fossil-fuel combustion, farm chemical manufacture, soil erosion processes, and the loss of native soil organic matter. Lal et al. (1998) made estimates that CO₂ emissions for agriculture are about 42.9 million metric tons of carbon yr⁻¹ or about 3% of all United States sources. This project will meet the goals of the State of California and the global community to reduce GHG emissions and assist in the long-term management and sustainability of the Earth's climate system.

The property is a working cattle ranch with a keen emphasis on wildlife. Adaptive range management will continue to be implemented to ensure the meadow systems are sustained for cattle operations and abundant wildlife use while using the least amount of water and energy as possible.

g. Performance Measures

We will report quantities and/or values of the following performance measures:

Performance Measures for all Categories

i) Number of People Reached

The Pit RCD will provide updates on our website, <http://www.pitriverriveralliance.net/pitracd/> regarding project implementation and successes. The project will also be featured in our quarterly newsletter and a field tour.

ii) Dollar Value of Resources Leveraged for the Sierra Nevada

The Pit RCD has a successful track record leveraging funds and we will leverage additional resources beyond those included in our budget.

iii) Number and Type of Jobs Created

Project will result in construction sector jobs relating to pipe construction and agricultural well production.

iv) Number of New, Improved or Preserved Economic Activities

Project will help preserve ranching, which is currently suffering in the region by reducing the overall cost and labor required to operate water delivery system.

b) Performance Measures Specific to Project Type

i) Reduction in Energy Use.

Pre-project diesel consumption will be compared to post-project electricity use to document the reduction in overall energy use.

ii) Reduction in Water Consumption

Pre-project water pumping time will be compared to post-project water pumping time to document the reduction in overall water use.

h. Budget Narrative

The diesel pump replacement and pipeline installation work will be solicited through two separate bid requests. It is possible that a single contractor could be awarded both contracts.

Diesel motors will be replaced with one 40 HP and one 80 HP three-phase induction motor. Each pump unit installation will include a variable frequency drive panel that will convert incoming fixed frequency single-phase power into a variable frequency and voltage for controlling the speed of the three-phase induction motor. Pumps will be installed in late October after the end of the irrigation season. A total of \$55,646 in SNC funding has been budgeted for this component of the project work.

8,280 feet of primary electrical line will be extended to the two pump locations in a buried trench. The work will be done by the local electric utility company, Surprise Valley Electric. They have given us a quote of \$25,600 to extend the electric service.

Work will be conducted between July and October with the landowner digging and filling in the trenches. SNC funds will be used to pay for the line extension charges billed by Surprise Valley Electric for this portion of the project.

Pipeline design calls for 17,050 feet of 20" PVC pipe; 3,400 feet of 15" PVC pipe and 2,400 feet of 12" pipe and associated valves and fittings. Pipeline will be installed in a buried trench during the months of October-November, after the irrigation season is over and when soil conditions are their driest. We have budgeted a total of \$320,605 for pipeline work with SNC funds being used to pay for \$240,754 of the work and landowner funds of \$80,000 to pay for the balance.

Project and Contractor Management will be provided by the Pit Resource Conservation District Project Director for the SNC project. We have budgeted \$15,000 for this work.

\$3,000 has been budgeted for monitoring and \$10,000 has been budgeted to cover the Pit Resource Conservation District's administrative expenses in connection with the project.

We will not know the precise cost for the pump and pipeline phases of the project work until we have received bids. We will prioritize the work to be done on the project as follows: 1) diesel pump replacements; 2) the north/south mainline pipeline; 3) the east west mainline pipeline; 4) extensions to the mainline pipeline. The work we will complete with the SNC funding will be fully functional and meet all the goals and objectives of the project.

The landowner is providing a \$20,000 in-kind contribution in the form of trenching and backfilling for the electrical line extension. The landowner is also providing an \$80,000 cash contribution toward irrigation pipeline installation costs that will not be covered by the SNC grant due to the \$350,000 cap.

Other funding sources being considered for any unfunded project needs include: NRCS/EQIP funding and California Department of Water Resources funding through the Upper Pit Integrated Watershed Management Plan funding application which will be submitted in March of 2013.