



GA0024 09

**OREGON WATER RESOURCE DEPARTMENT
WATER CONSERVATION, REUSE AND STORAGE
GRANT PROGRAM**

RECEIVED
SEP 02 2008
WATER RESOURCES DEPT
SALEM, OREGON

I. Grant Information

Project Name: Surface Water Storage Assessment

Type of Grant Requested: Water Conservation Reuse Above Ground Storage
 Storage Other Than Above-Ground [Including Aquifer Storage and Recovery (ASR)]

Program Funding Dollars Requested: \$ \$67,000 Total cost of planning study: \$ \$134,000
Note: Request may not exceed \$500,000

II. Applicant Information

Applicant Name: <i>Kerns Rainbow Ranch, Inc.</i>	Co- Applicant Name:
Organization:	Organization:
Address <i>45917 Quail Road</i> <i>Haines, OR 97833</i>	Address:
Phone <i>541-856-3449</i>	Phone:
Fax: <i>1-999-889-1303</i>	Fax:
Email: <i>jkerns@bmi.net</i>	Email:

Fiscal Officer Name: <i>Jan Kerns</i>	Principle Contact:
Organization: <i>Kerns Rainbow Ranch, Inc.</i>	Organization:
Address: <i>45917 Quail Road</i> <i>Haines, OR 97833</i>	Address:
Phone: <i>541-856-3449</i>	Phone:
Fax: <i>1-888-889-1303</i>	Fax:
Email: <i>jkerns@bmi.net</i>	Email:

Certification:

I certify that this application is a true and accurate representation of the proposed work for a project planning study and that I am authorized to sign as the Applicant or Co-Applicant. By the following signature, the Applicant certifies that they are aware of the requirements of an Oregon Water Resources Department grant and are prepared to implement the project if awarded.

Applicant Signature: *Kerns Rainbow Ranch, Inc. by Janice L. Kerns* Date: 8/30/2008
Print Name: *Kerns Rainbow Ranch, Inc. by Janice L. Kerns* Title: *Secretary/Treasurer*

III. Planning Study Summary

Please give a brief summary of the planning study using no more than 150 words.
The assessment study will evaluate the feasibility of, and potential for, construction of 6 supplemental irrigation water storage structures located on the property of the owners of Kerns Rainbow Ranch, Inc., The storage water is needed for later-season (mid-July through October) irrigation. The assessment study will include site geologic and soil evaluations, suitability for dam construction, analysis of hazard potential, water storage and fill volume calculations, preliminary engineering of dam/retaining structures, necessity/options for sealing of containment area, specifications and location of construction materials, and preliminary design of a connecting delivery system to the existing irrigation system. There will also be an evaluation of any necessary wetland mitigation(s) as well as wildlife benefits and enhancements

IV. Grant Specifics

Section A. Common Criteria

Instructions: Answer all questions in this section by typing the answer below the question. It is anticipated that completed applications will result in additional pages.

1. Describe how the planning study will be performed. Include:

- a. A description of the planning schedule/timeline, which includes identifying all key tasks. (Section VI provides an opportunity for a “graphical” representation of the schedule.)

Proposed scope of work:

1. *Mapping and surveying of 6 potential storage site locations. This would include evaluating potential for water stored (acre feet) and proposed necessary dam height to reach storage capacity goals. This will be accomplished using traditional survey techniques (total station, GPS, levels) as well as GIS analysis for larger scale analysis.*

2. *Evaluate site suitability based upon the following factors:*

A. *Geology*

B. *Terrain*

C. *Water delivery to impoundment*

D. *Water delivery from impoundment to irrigation system*

E. *Supply water availability*

F. *Wetland deliniation and impacts*

G. *Potential impact to downstream areas -- consideration of habitat improvement and dam, failure analysis.*

3. *Preliminary planning for construction details -- dam fill, lining/sealant determination, outlet structure details.*

4. *Determine if wetland mitigation action is necessary. If so, scope out where mitigation action could be taken.*

- b. When the planning study could begin.

Upon funding availability

2. Provide a description of the relevant professional qualifications and/or experience of the person(s) that will play key roles in performing the planning study. If the personnel have not been decided upon, include a description of the professional qualifications and/or experience of the person(s) you anticipate will play key roles in performing the planning study.

Kerns Rainbow Ranch, Inc. personnel will provide the fiscal and organizational services for the project. Kerns Rainbow Ranch has personnel that is trained in planning, implementation, and operation of irrigation projects, having installed 15 miles of irrigation pipeline and 2000 acres of sprinkler irrigation. In addition, one of the KRR personnel was the construction project manager for the installation of 14 miles of livestock water pipeline, over 100 troughs on 12 separate landowners.

Technical expertise will be procured as needed for such services as: design; geological consultation and permitting. Dan Axness, of McMillen Engineering will be the primary engineering consultant assisting with the planning study. Dan Axness is a principal engineer with over 17 years of

experience in the planning and design of water resources, irrigation, and fisheries engineering projects. Dan has led the planning, design and construction of a number of water storage structures of this size in Eastern Oregon and the Pacific Northwest. Growing up on a ranch outside of Baker City, Oregon, Dan brings an understanding of the farming and ranching community and has a proven ability to communicate with irrigators and project stakeholders and specifically the Kerns' whom he has worked with on a professional basis for the last 17 years. While working for the NRCS in Baker City, Dan developed an in-depth understanding of irrigation systems from the diversion structure to the field including irrigation reservoirs, fish passage structures, fish screens, bypass pipelines, canals, pipelines and sprinkler and flood irrigation systems. In addition, Dan has led reservoir siting analyses for the Corps of Engineers, private landowners and industrial food processing clients in Oregon and Washington. Dan will be supported with a multi-discipline in-house team of professionals. McMillen Engineering maintains expertise in civil, mechanical, transportation, fisheries engineering, permitting, and CAD designers. Table 3 summarizes our team member's related and overall experience.

3. What local, state or federal project permitting requirements/issues do you anticipate in order for the planning study to be conducted?

None anticipated. We will explore with the Baker County Planning Department, Water Resources Department, Oregon Division of State Lands and the Army Corp of Engineers what their "next step" permitting process will be, so we'll be prepared to seamlessly move to the construction phase, if the assessment study proves to provide a positive cost/benefit ratio.

4. Are permits/governmental approvals required for the planning study? If yes, indicate whether you have obtained the necessary permits/governmental approval. If you have not obtained the necessary permits/governmental approval, describe the steps you have taken to obtain them.

None needed at the assessment stage.

5. Describe your goal (which must be based on evaluating the feasibility of developing a water conservation, reuse or storage project) and how this study helps to achieve the goal.

The goal of the assessment will be to determine the feasibility of storage irrigation water in some intermittent flow drainages. Through the assessment study we will be able to determine if the amount of stored water will be worth the cost of construction of the 6 potential storage sites. We will be looking at the cost/benefit of the project -- both short and long term.

We wish to continue to move toward a long-term water conservation management plan. We currently operate without any storage capability. This creates several problems for managing an effective Irrigation Water Management (IWM) program. The basis of an effective IWM program is to be able to apply water when needed in the correct quantity. In our current situation, excess run-off water in the spring escapes us. We also experience water shortages in the later season which prevents adequate irrigation, reduced yields, and reduced quality. We must depend on ground water from wells as stream-flows dwindle. As energy costs increase and ground water elevations fall, operation of these wells will continue to increase in cost.

By containing the run-off water as well as utilizing water from Rock Creek, Willow Creek, and perhaps Pine Creek, during the non-irrigation season, we will be creating a reservoir of stored water for use later in the summer, when our surface water gets in short supply. An additional benefit of having stored water will be to resolve the conflict of heavy reliance of annual small grain crops which are grown due to the shortage of late-season irrigation water. Annual crops require significant

energy input for tillage and replanting and have a much greater potential for soil loss than do perennial hay crops.

We would like to explore the possibility of a permit to use "excess" water for storage filling during the early part of irrigation season when the heavy snow melt causes streams to rapidly rise, and irrigators can't use all the water. Typically there is one-to-two weeks of this event which threatens down-stream infrastructure -- roads, culverts , and even the City of Haines.

We need more water for later-season irrigation than our present surface water rights allow. The potential of developing some storage ability would help to reduce the use of our irrigation wells, thus saving electricity to pump the groundwater, as well as reducing the removal of groundwater from this aquifer.

6. Describe the technical aspects of the planning study and why your approaches are appropriate for accomplishing the goal of the planning study.

The planning study will be looking at typical cropping systems and water needs, as well as the engineering required to construct the storage dams. It will also look at the design and engineering of the delivery systems from each storage facility to connect to our mainline delivery system which delivers our surface and groundwater to the center pivots and wheellines. The engineering must be done to determine the cost/benefit of the projects, as well as the feasibility of construction in the desired locations.

A. Kerns Rainbow Ranch system inventory and analysis:

- Typical crop inventory*
- Historical crop water use demand*
- Historical delivered water records*
- Representation (numerical & graphical) of actual delivered vs. estimated crop demands*
- Effect of water supply on crop yields and quality*
- Quantity needed from storage for late season water*
- Existing delivery infrastructure*
- Available water to fill project storage*

B. Storage site inventory and analysis

- Site suitability*
- Identify needed infrastructure for delivery to and from storage sites*
- Identify needed design, permits, mitigation and construction components for storage sites*
- Cost/benefit analysis for each site*

C. Storage construction design

- 75 % complete design for impoundments*
- Attempt to use common approach whenever possible for structures and components*
- Prepare plan for any mitigation efforts required*
- Begin investigation & initial preparation for any permits necessary*

7. Describe the level of involvement, interest and/or commitment of different entities associated with the planning study (attach letters of support). Describe how these entities will benefit or be impacted by the planning study.

Kerns Rainbow Ranch, Inc., and the principal owners of it, are the only entities involved.

While it is anticipated that there will be a "spin-off" benefit to both big game and water-fowl by increasing the availability of water, and habitat, we are not considering that the game (and ODFW) are an entity. Another "spin-off" benefit will be additional ponded surface water availability for fire suppression by Oregon Department of Forestry, the U.S. Forest Service and the B.L.M..

Any concerns by downstream water users will be addressed in the study, and in the permitting process.

Above-Ground Storage

Please answer the following three questions **BEFORE** proceeding:

Will the project divert greater than 500 acre-feet of surface water annually? Yes No

Will the project impound surface water on a perennial stream? Yes No

Will the project divert water from a stream that supports sensitive, threatened or endangered species? Yes No

If you answered "Yes" to any one of these questions, by signature on this application, you are committing to include the following elements in your planning study:

- **Analyses of by-pass, optimum peak, flushing and other ecological flows of the affected stream and the impact of the storage project on those flows;**
- **Comparative analyses of alternative means of supplying water, including but not limited to the costs and benefits of water conservation and efficiency alternatives and the extent to which long-term water supply needs may be met using those alternatives;**
- **Analyses of environmental harm or impacts from the proposed storage project;**
- **Evaluation of the need for and feasibility of using stored water to augment in-stream flows to conserve, maintain and enhance aquatic life, fish life and any other ecological values; and**
- **For a proposed storage project that is for municipal use, analysis of local and regional water demand and the proposed storage project's relationship to existing and planned water supply projects.**

Proceed in answering the following questions:

1. Describe when and to what extent the project associated with the planning study includes provisions for using stored water to augment instream flows to conserve, maintain and enhance aquatic life, fish life or other ecological values.

There are two small "creeks" (common name Shaver Creek, and Hunt Creek) that are intermittent, and do not "go anywhere" -- i.e., they disappear shortly after they pop-up. There is another "wet spot" that does not flow water, and has neither a defined beginning nor end. None of these have any connectivity nor established channel at the bottom end, so there is no possibility of augmenting in-stream flows. There are no fish in any location.

Other ecological values would be enhancement of water availability for both big game and water-fowl. All are in big game travel routes and established habitat areas, and would be well used. These additional watering sources could also help to deflect the big game from travelling through high value cropland in search of water.

2. Describe the water supply need(s) that the project associated with the planning study in intended to meet. Applicant should reference supporting documentation that would be available upon request.

The late season stored water would give us better water management for our crops. Our surface rights (although the majority are quite senior) do run out in the latter part of the summer. We have irrigation wells to supplement the late season irrigation needs. Having storage water available would reduce the demand for electricity for pumping, as well as help conserve the groundwater in this aquifer. It would save both energy and groundwater.

3. Explain how the project associated with the planning study will meet the water supply need(s), and indicate what percentage of that need will be met. (For example: If your water supply need is 20,000 acre-feet of additional water and the project will supply 10,000 additional acre-feet, 50% of your need will be met).

Ideally, the lands under this project need approximately 2100 acre feet of additional water to supplement the adjudicated rights that currently serve them. This project could conceivably provide at least 250 acre feet of stored water (50 acre feet per impoundment, or 12% of the additional need). Two hundred fifty acre feet would supply 900 gpm (2cfs) for approximately 60 days. This is the equivalent of use of two of our present wells and will supply full later season irrigation to 150 acres.

4. Present convincing argument that there are no other reasonably achievable alternatives that would be able to meet the water supply need(s). Applicant may reference supporting documentation that would be available upon request.

Kerns Rainbow Ranch has demonstrated that water conservation is an extremely viable method in making scarce water go farther. We have had on-going water conservation construction and implementation projects for many years. We have converted from surface/flood irrigation to center pivots, wheellines where pivots are not applicable, and hand lines for corners. All these methods are utilized. All pivots are low pressure with drop tubes. We have also constructed a high-pressure, gravity flow delivery system which has taken 165 hp of pumps off the delivery system.

We have heavily invested in water conservation projects where the water availability and the quality of the ground warrant it. However, there are some of our lands that do not warrant heavy investment in water conservation projects, as the soil quality is not capable of growing high value crops, and the water availability is from a junior right.

The irrigation reservoirs in this watershed (Rock Creek, Killamacue, and Pine Creek) are already adjudicated to other users. There are no other major storages on the actual drawing board for this watershed. A Baker County group of irrigators (WASH committee) is in the preliminary stages of assessing the feasibility of several large storages in a number of watershed basins, but implementation and construction of them is a long way off. Kerns Rainbow Ranch fully supports and endorses this broader scope impoundment study.

We presently have four irrigation wells that serve our property, and permits for 4 more to be constructed. Wells are very expensive to construct, to install the pumps and delivery system infrastructure, and to operate and maintain. As the cost of materials continues to climb they will get even more expensive to construct. Electric rates are projected to really escalate over the coming years, making the wells even more expensive to operate.

If the assessment/feasibility study proves that these smaller storages will perform as we expect, and if the cost/benefit analysis proves that they are a good investment, we can reduce our reliance on the groundwater wells. (There will always be a degree of need for the wells as "insurance" for the years that there is lower than normal snowpack to create the run-off projected to be captured by these storages.)

This project would be a positive step towards reducing electricity used in pumping from our wells. It also would reduce the permitted withdrawals from this aquifer. It is a "win-win" project both from electricity savings and from reduced draw on groundwater

5. Provide data and information on the associated project and the project's sources of water supply:
- The location of the associated project. (Include the basin, county, township, range and section.)

Powder River Basin -- HUC # 17050203 -- Baker County

Project #1 -- Shaver Creek T 7S, R 38E W.M., Sec. 34

Project #2 -- Parker Place T 8S, R 38E W.M., Sec. 11

Project #3 -- Between CJ's T 8S, R 38E W.M., Sec. 11

Project #4 -- Tim's house T 8S, R 38E W.M., Sec. 12

Project #5 -- Sackos pump T 8S, R 38E W.M., Sec. 12

Project #6 -- Hunt Creek T 8S, R 38E W.M., Sec. 34

** See attached Google aerial photo map and attached HUC legals with lat/long*

- The name(s) and river mile(s) of the source water and what they are tributary to, if applicable.

No connectivity to any surface water source.

- Whether the project will be off-channel or on-channel.

These projects are "off-channel" in that they will be collecting and impounding run-off that has no channel for connectivity to any live surface water. Shaver Creek has a defined channel for a short distance, and then disappears to never re-surface. Hunt Creek has no channel once it leave the base of the mountain. It has two surface rights for it's use, and is totally used for early irrigation. It does not run later than mid-June. It does not connect to any channel nor surface water.

- Water availability to meet project storage. (Typically, the Department evaluates new storage projects using a 50 percent water availability analysis.)

On a normal snowpack year, the proposed impoundments will fill from normal spring runoff. They will partially fill in drought years, due to the scope of their collection areas.

During drought years, we may need to supplement filling of them from either Rock, Willow or Pine Creek. Rock and Willow creeks are screened within our system, so we have built-in fish passage controls. Any withdrawals for storage would occur during non-irrigation season or flood stage from rapid snow melt

A portion of the site assesment is to quantify the available water to meet project storage.

- Proposed purposes and uses of stored water.

Supplemental irrigation water

- Environmental flow needs and water quality requirements of supply source water bodies.

In the event that we needed to supplement the normal run-off water to fill the storage to capacity, we would propose to be using Rock Creek, Willow Creek and Pine Creek during the off-irrigation season of the year and flood stage created by rapid snow melt in the spring. All are tributaries of the Snake River. Willow Creek is not listed for any threatened or endangered species. Rock and Pine Creeks are listed as Critical Habitat for bull trout.

N
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K-HAINES



5 miles west of Haines, Oregon. (Baker County)
See legal descriptions for pond locations.

Google map to accompany application for Kerns Rainbow Ranch, Inc.

ATTACHMENT 1

Powder River Basin -- HUC # 17050203 -- Baker County

				Latitude	Longitude				
Pond 1	Shaver Creek	T 7S	R 38E W.	Sec. 34	44.90466	-118.045194	-118.045194, 44.90466		
Pond 2	Parker Place	T 8S	R 38E W.	Sec. 11	44.89302	-118.018482	-118.018482, 44.89302		
Pond 3	Between CJ's	T 8S	R 38E W.	Sec. 11	44.886523	-118.014459	-118.014459, 44.886523		
Pond 4	Tim's house	T 8S	R 38E W.	Sec. 12	44.884193	-118.008041	-118.008041, 44.884193		
Pond 5	Sackos pump	T 8S	R 38E W.	Sec. 12	44.883141	-118.002613	-118.002613, 44.883141		
Pond 6	Hunt Creek	T 8S	R 38E W.	Sec. 34	44.869577	-117.996885	-117.996885, 44.869577		

Quads Sheets				
Anthony Butte	Tucker Flat	North Powder		
Anthony Lakes	Rock Creek	Haines		
Bourne	Elkhorn Peak	Wingville		
Pond 6 Quads				
Rock Creek	Haines	Magpie Peak		
Elkhorn Peak	Wingville	Baker		
Phillips Lake	Blue Canyon	Bowen Valley		

ATTACHMENT 2 — LEGAL LAT/LONG

KERUS RAINBOW RABBIT, INC

6. Provide a review of the local, state, and/or federal permitting requirements and issues posed by the implementation of the project associated with the planning study.

No permits will be required for the study. We anticipate the following permits will be required for the construction and implementation of the project:

Baker County Planning Department -- no issues anticipated.

Oregon Water Resources Department -- permits will be required for storage, and possibly additional permits for supplement irrigation of surface water. No issues anticipated.

Oregon Division of State Lands -- no issues anticipated since we will not be in any stream channels that are live flowing streams with connectivity to tributaries. We may have wetland issues to address in 5 of the 6 projects. In that case we are prepared to do wetland mitigation activities.

U.S. Army Corps of Engineers -- since we are working with waters of the United States (snow pack runoff) we will be consulting with them, and securing any required permits to comply with their requirements.

V. Match Funding Information

Applicants must demonstrate a minimum dollar-for-dollar match based on the total funding request. The match may include a) secured resources, b) previously expended resources, and/or c) pending resources. For secured funding, you must attach a letter of support from the match funding source that specially mentions the dollar amount shown in the "Amount/Dollar Value" column. For pending resources, documentation showing a request for the matching funds must accompany the application. For resources that have been previously expended, the expenditure must have occurred on or after July 1, 2005. Resources expended prior to July 1, 2005 are not eligible for match purposes.

The Type of matching funds may include:	The Status of matching funds may include:
<ul style="list-style-type: none"> • The value of in-kind labor, equipment rental and materials essential to the planning study provided by the applicant or partner*. 	<ul style="list-style-type: none"> • Secured funding commitments from other sources.
<ul style="list-style-type: none"> • Cash is direct expenditures made in support of the planning study by the applicant. 	<ul style="list-style-type: none"> • Associated and documented expenditures for the planning study from non-program sources incurred on or after July 1, 2005.
	<ul style="list-style-type: none"> • Pending commitments of funding from other sources. In such instances, Department funding will not be released prior to securing a commitment of the funds from other sources. Pending commitments of the funding must be secured within 12 months from the date of the award.

*"Partner" means a non-governmental or governmental person or entity that has committed funding, expertise, materials, labor, or other assistance to a proposed planning study. OAR 690-600-0010.

Match Funding Source (if in-kind, briefly describe the nature of the contribution)	Type (✓ One)	Status (✓ One)	Amount/ Dollar Value	Date Match Funds Available (Month/Year)
<i>Kerns Rainbow Ranch</i>	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending	\$67,000	<i>January 09</i>
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		

VII. Project Planning Study Budget

Section A

Please provide an estimated line item budget for the project planning study. An example would include: labor, materials, equipment, contractual services and administrative costs.

Line Items <i>Note: Administrative costs may not exceed 10% of the total funding requested by the Department.</i>	Unit Number (e.g. # of hours)	Unit Cost (e.g. hourly rate)	In-Kind Match	Cash Match Funds	OWRD Grant Funds	Total Cost
<i>Administrative costs included in project planning study elements in the in-kind match column.</i>	120	\$50.00	\$6,000			\$6,000
<i>On-Site Planning, surveying, storage analysis, wetland mitigation planning, pipeline connection details, outlet details</i>	920	\$50.00	\$46,000			\$46,000
<i>Excavation/Drilling by Kerns Rainbow Ranch for subgrade and fill investigation</i>	120	\$125.00	\$15,000			\$15,000
<i>Professional Services provided by McMillen Engineering and other contractors</i>	600	\$100.00			\$60,000	\$60,000
<i>Lab and Equipment Expenses by McMillen Eng.</i>					\$5,000	\$5,000
<i>Travel and Reproduction Expenses</i>					\$2,000	\$2,000
Administrative Costs						
Total for Section A			\$67,000		\$67,000	\$134,000
Percentage for Section A			50%		50	100%

Section B

If Grant amount requested is \$50,000 or greater, you **MUST** complete Section B. Elements (key tasks) in Section B should be the same as the elements (key tasks) in Section VI (Project Planning Study Schedule).

To add a project to the inventory of potential conservation opportunities, please provide the following information for each conservation project.

This is a <input checked="" type="checkbox"/> Capital Conservation Project <input type="checkbox"/> Programmatic Conservation Project	
Project #/Name	Please see attached
Project Description	
Estimated Future Savings	
Seasonality	
Estimated Future Costs	
Implementation Schedule	
What are the barriers to implementation, e.g. funding?	
This is a <input type="checkbox"/> Capital Conservation Project <input type="checkbox"/> Programmatic Conservation Project	
Project #/Name	
Project Description	
Estimated Future Savings	
Seasonality	
Estimated Future Costs	
Implementation Schedule	
What are the barriers to implementation, e.g. funding?	

- Include this form with your application -

Inventory of Potential Conservation Opportunities

Kerns Rainbow Ranch, Inc.

“Wish list” of Water Development and Conservation Projects

For the last 20 years we have been in an intensive “water conservation” mode, as we have found better ways to deliver and utilize our available water. Please consider the “wish list” projects listed below to be added to your list of potential conservation opportunities. The surface water sources for them would be Rock Creek, Willow Creek and Pine Creek.

In the early 1970’s Kerns Rainbow Ranch began implementing new and better irrigation application practices when we moved from all flood irrigation to some hand line sprinkler irrigation. The next improvement was the move to wheelline irrigation. In 1987 the first center pivot was installed. Low pressure sprinkler packages have been installed on all of our pivots to conserve water.

Although the conversion to center pivot water application did a better job of applying the water, it did not make the surface water last longer into the irrigation season. The first irrigation well was drilled in 1992 for supplemental irrigation. Since that time, two more wells have been brought on line, for supplemental irrigation.

Wells are expensive to construct, and expensive to operate. This application for the assessment of potential storage water will round-out our water availability, be less costly to deliver than well water, and will conserve groundwater in the Baker Valley aquifer.

Our irrigation delivery system developed in stages, which were appropriate for that particular need or portion of the system. We now face some major impediments to a full system that is both energy efficient, and has unconstrained delivery capability.

We also have permits to drill 4 more irrigation wells, and are evaluating and prioritizing them for construction. For example, the ones that will be the least expensive to drill, and have the best prospect of getting good water, will also have to have the delivery system totally redone. The 6” and 8” mainline pipe needs to be replaced with 12” to achieve the most efficiency in pushing the water up-gradient. The well location that will have the most efficient delivery system already in place, will be the most expensive to drill due to the anticipated depth to adequate water. Each year that construction is delayed increases the cost of both the well construction and the delivery system due to the rapidly escalating cost of steel and metal.

In 2004 a high pressure, gravity flow mainline system was installed. That system has allowed us to remove 165 hp of booster and lift pumps from our irrigation delivery system. It also has the benefit of delivering pre-cleaned water to our pivots, which has reduced our maintenance costs on nozzles.

“Wish list” for higher efficiency delivery and water conservation

1. Increase mainline capacity to reduce friction. Reduced friction will reduce the cost of pumping the water through the pipe.
2. Increased mainline capacity will also allow us to more efficiently utilize the high pressure mainline capacity for full-system delivery.
3. Consolidate diversions into the high pressure/gravity flow mainline to reduce ditch and evaporation loss. This will enable us to go to sprinkler irrigation on lands that are not suitable for planting high-value crops, and where we cannot justify the expenditure of moving to sprinkler application instead of flood application. These lands are primarily pastures and are presently being flood irrigated. Sprinkler irrigation would both save water, and would yield higher production.
4. Pipeline for Williams Ditch (Pine Creek) delivery. This will eliminate a lot of ditch loss and water evaporation from the open ditch.
5. Construct additional gravity flow/high pressure delivery systems to eliminate lift and booster pumping for water delivery.
6. Fish screen all POD's after consolidation of diversions.
7. Investigate a small power generation facility in conjunction with a gravity flow/high pressure diversion.

All of these projects need to be done to make our farm/ranch operation operate in the most energy efficient manner possible, and conserve the most water. They will all be expensive, but cost and environmentally effective.

Construction of large scale storages on Rock Creek and Pine Creek.

Construction of these large scale storages would be a community effort, probably led by the Baker County Watershed and Stream Health (WASH) committee. These could potentially benefit thousands of acres for supplemental irrigation, as well as providing valuable flood control and in-stream later season flow augmentation.