

**Bonneville Power Administration
Fish and Wildlife Program FY98 Watershed Proposal Form**

Section 1. General administrative information

Title **Improve Return Flow Water Quality**

Bonneville project number, if an ongoing project 8048

Business name of agency, institution or organization requesting funding
Roza-Sunnyside Board of Joint Control

Business acronym (if appropriate) RSBOJC

Proposal contact person or principal investigator:

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Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name

NPPC Program Measure Number(s) which this project addresses.

NMFS Biological Opinion Number(s) which this project addresses.

Other planning document references.

Subbasin.

Lower Yakima River

Short description.

Improve the quality of water discharged from individual farming operations. This will be accomplished by identification of sources of lower quality return flows using aerial photography and field inspections. Technical assistance will be made available.

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction		Watershed
*	Resident fish		O & M		Biodiversity/genetics
*	Wildlife	X	Production		Population dynamics
	Oceans/estuaries		Research	*	Ecosystems
	Climate		Monitoring/eval.		Flow/survival
	Other		Resource mgmt		Fish disease
			Planning/admin.		Supplementation
			Enforcement	X	Wildlife habitat enhancement/restoration
			Acquisitions		

Other keywords.

Water quality, soil erosion, fish survival, wildlife habitat

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Aerial Photography	a	Obtain current high quality photography of RSBOJC service area
2	Define Sources of Sediment	a	Interpret photos to identify irrigation methods
		b	Field verify sources of sediment
3	Prioritize Severity of Problems	a	Establish criteria for ranking
		b	Develop a priority list

4	Pilot Program Implementation	a	Identify several farms for technology demonstration
5	Full Scale Implementantation	a	Provide technical assistance and funding support to farms

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	6/1998	8/1998	1.00%
2	8/1998	1/1999	1.00%
3	1/1999	1/1999	1.00%
4	2/1999	10/1999	2.00%
5	10/1999	12/2004	95.00%
			TOTAL 100.00%

Schedule constraints.

Financial impact to landowners may affect implementation schedule.

Completion date.

2004

Section 5. Budget

FY99 budget by line item

Item	Note	FY98
Personnel	RSBOJC Staff	\$22,000
Fringe benefits		\$11,000
Supplies, materials, non-expendable property		
Operations & maintenance		
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		
PIT tags	# of tags:	
Travel	Vehicle mileage	\$2,000
Indirect costs	Office overhead	\$3,000
Subcontracts	Aerial photographs	\$30,000
Other		
TOTAL		\$68,000

Outyear costs

Outyear costs	FY99	FY00	FY01	FY02
Total budget	\$105,000	\$1,700,000	\$1,700,000	\$1,700,000
O&M as % of total				

Section 6. Abstract

The Roza-Sunnyside Board of Joint Control (RSBOJC) service area contains over 170,000 acres of irrigated farm land. Many of the soil types in the project are very fine textured and of excellent quality for growing crops. However, they tend to be highly erodeable. Due to their very small particle size, the eroded soil remains in suspension in the waterways ultimately making its way to the Yakima River. The proposed project to improve the quality of the return flows will have many positive effects. The basic concept of the water quality improvements will focus on conversion of surface flooding irrigation methods (rill, furrow, and wild flooding) to controlled rate application systems such as sprinkler or drip systems. Some of the more significant benefits are: a) the loss of soil from the farmed fields will be reduced, b) drain channel maintenance costs (sediment removal) will be reduced, and c) the quality of the Yakima River will be improved.

The water quality improvements will be achieved through a four step program which will consist of: inventory of sediment sources using aerial photography and field verification, prioritization of problem areas, operation of a pilot program, and full scale implementation.

With adequate funding, the program could be started during the 1998 irrigation season. Full implementation could occur between the years 1999 and 2004. The water quality improvements would be achieved as soon as the on farm improvements are made during implementation. The success of the program would be measured as part of the RSBOJC water quality monitoring program. The presence of constituents such as turbidity, suspended solids, and fecal coliform in the water returning to the Yakima River are expected to diminish as the return flow improvement program is implemented.

Section 7. Project description

a. Technical and/or scientific background.

The water quality of the Yakima River has been evaluated by many agencies. Those studies conclude that the low flow rates and high levels of turbidity that exist at certain times of the year are detrimental to fish and wildlife. Several studies and on going data collection programs identify agricultural practices as significant sources of suspended sediments. The very fine texture of soil in the lower Yakima Valley that makes it premium farm land also contributes to the basin's water quality problem. The fact that the soil erodes very easily and then stays in suspension for long periods of time makes it necessary to actively manage the problem that has existed for many years.

Recent efforts to conserve water by improving irrigation distribution systems and modernizing farm practices have had some influence on water quality, especially turbidity. However, there are significant areas that still use irrigation practices (rill, furrow, and wild flooding) that result in soil erosion. The areas that contribute to the problem have not been identified or inventoried.

b. Proposal objectives.

It is the objective of the return flow improvement project to improve the quality of water returning to the Yakima River. The program represents significant increment of improvement that can be achieved with cooperation from the farm operators. The work will generally enhance the current farming practices and will improve the irrigation water application efficiency. The project will result in a substantial amount of water savings.

The success of the return flow improvement project can be monitored by expanding the agency's water quality program. Much background data has already been collected and will serve as a benchmark to measure the improvements.

c. Rationale and significance to Regional Programs.

The rationale behind the return flow improvement project is very basic. In most cases, irrigation systems can be converted from surface systems to controlled application systems (sprinklers or drip) without changing the crop pattern. However, most of the proposed systems will require installation of pumping and filtration equipment. These systems will require power and annual maintenance. Some farmers may not be willing or able to pay all of these costs and may need financial support.

d. Project history

The proposed program represents an acceleration of the gradual modernization of irrigation application techniques. Farm operators in the RSBOJC system have been converting to more efficient (less erosive) irrigation methods for many years. In most cases, financial constraints limit the rate at which the modernization is implemented. In the past, the factors that generally motivated a farmer to convert were: labor savings and water savings. Although most all farmers agree that erosion is undesirable, there has been very little incentive to invest money for that single purpose. Consequently, there are still a significant number of farms that are rill and furrow irrigated.

e. Methods.

Implementation of the return flow improvement project will consist of several sequential steps. It will be necessary to inventory the irrigation practices within the RSBOJC to determine the sources of sediment laden runoff water. The use of current aerial photography would expedite the preliminary work to survey the project which serves more than 170,000 acres. It is possible that the photography needed for this project will

also be usable for other related work. To supplement the photo interpretation work, it will be necessary to make a field review the specific farms targeted for improvements. Details such as crop pattern, utilities, topography, soil characteristics, land ownership, and access will be best determined in the field.

After the potential sites are identified, it will be necessary to evaluate the benefits and impacts associated with each one. A priority ranking for the sites can be developed to assure that the work is directed toward the ones that will produce the best results at reasonable costs.

The construction activities that will be required are expected to be the same as currently practiced by qualified local irrigation equipment installers. The work that will be needed to convert the systems will have to be done during the non-irrigation season.

There will be a need for continuing inspection and maintenance of the irrigation equipment. It is expected that the farm operators will be willing and able to assume this responsibility. No continuing O & M budget is projected as part of the publicly funded project.

f. Facilities and equipment.

The planning work needed to initiate the return flow improvement project is similar to the type of work regularly performed by the RSBOJC staff. It is not anticipated that it will be necessary to acquire any additional specialized equipment or facilities. The workload to implement the project will require at least one additional staff member early in the project and two members during the construction phase.

g. References.

CH2M HILL, 1975. Agricultural Return Flow Management in the State of Washington. Prepared for Washington State Department of Ecology.

Department of Ecology, 1990. Statewide Water Quality Assessment 350 (B) Report, State of Washington.

USGS, 1976. Sediment Transport by Irrigation Return Flows in the Lower Yakima River Basin, Washington. Open File Report 78-946.

Section 8. Relationships to other projects

The return flow improvement project is related to efforts currently underway and proposed to improve the quality of water in the lower reaches of the Yakima River. This project very specifically links to and depends upon the RSBOJC water quality monitoring program. It is also closely tied to the waterway buffer strip improvement program. Aerial photography that is needed for the buffer strip program will expedite the return flow improvement program.

On a larger scale, the improvements made to the RSBOJC irrigated farms will produce significant increments of water quality improvement and water savings that are complementary to the programs done by others in the Yakima Basin.

Section 9. Key personnel

The work will be accomplished with RSBOJC staff and a limited amount of staff hired locally for the duration of the project. The workload at the beginning of the project will require one additional staff member. After the first year of planning work, the workload will increase and at least two staff members will be needed to manage the program.

Section 10. Information/technology transfer

The project is expected to serve as a demonstration of the benefits that can be achieved by managing the quality of water that returns to irrigation and drainage waterways by using improved irrigation techniques. This concept could be applied to many other irrigation and drainage projects.