11/17/10

INSTRUCTIONS
OUTLINE OF PUEBLO REPORTS

All Pueblo reports are to be submitted in the same format and address the following topics. Using the example provided by the Pueblo de Cochiti, all other pueblos are requested to begin work on their own report. For questions please contact Viola Sanchez at 505-270-3046 or vsanchez@usbr.gov .

Background. The Pueblo will detail historical, cultural, economic, and other factors important to understanding their values, needs, and problems bearing on the overall irrigation infrastructure improvement project.

Eligibility of Facilities. In order to be eligible, there must be an existing irrigation or drainage facility which will be repaired, rehabilitated, or replaced. The Pueblo will show existing irrigation and drainage facilities and the areas served by these facilities on a map and/or with photographs. Descriptions of each facility will be listed separately.

Proposed Projects. The Pueblo will show proposed projects on a map and include a summary spreadsheet for all proposed projects. A more detailed description of each individual proposed project will also be included.

Adjudications and/or Negotiated Water Rights Settlements. The Pueblo will discuss any ongoing water rights adjudications or negotiated settlements and whether these will have an impact on proposed projects.

Water Management. The Pueblo will describe water management within the pueblo and with outside entities which may be affected by proposed projects. Possible examples include internal scheduling, roles of mayordomos or tribal officials, water measurement, cooperative arrangements with upstream or downstream pueblos or acequia groups, agreements resulting from adjudications or negotiated settlements, etc.

Land Ownership. Land ownership issues which may affect projects, and how they will be handled by the Pueblo, will be addressed.

Checkerboarding. The location and extent of non-Indian facilities or non-Indian users sharing facilities with Pueblos, and how it will be handled on proposed projects, will be addressed.

Operation and Maintenance. The Pueblo will describe plans on how they plan to operate, maintain, and eventually replace facilities reconstructed through this project, including financing if required.

Cost Share. The Pueblo will describe ways in which they can provide part or all of the necessary 25% non-federal cost share and whether they will request a hardship waiver for some or all of the cost sharing requirements.

Utilization of Reconstructed Facilities. The Pueblo will describe planned utilization of reconstructed facilities, including (if applicable) the time frame to farm areas after improvements are made.

REPORT OF THE PUEBLO DE COCHITI
Study for New Mexico Pueblos Irrigation Infrastructure Project

Background. The Pueblo de Cochiti has practiced irrigated agriculture since time immemorial. In more recent times irrigation diversions have been from the Rio Grande and the Santa Fe River. Through the federal Act of March 13, 1928, the Pueblo de Cochiti became part of the Middle Rio Grande Conservancy District (District). Instead of having multiple diversions from the Rio Grande, the irrigation ditches were combined so they could be served by one diversion structure, the District's Cochiti Diversion Dam. Irrigation from the Santa Fe River was not affected by the Pueblo de Cochiti's inclusion in MRGCD.

At the inception of the District, the Pueblo had many more, smaller farm fields than it does today, although total irrigable acreage has remained the same. Families were growing mainly food crops for personal consumption or barter. Farming was much more labor intensive, with whole families working their fields. There was a minimum of mechanized farm equipment. There were far more farm ditches than there were today, and lands were not leveled.

As a result of flooding during the floods of 1941 and 1942, the Bureau of Indian Affairs terraced farm fields in the 1950's, creating much larger plots which lent themselves to more mechanized agriculture. The fields were mostly rectangular and were laid out in a grid. Fewer farm ditches were required to supply water to these larger fields. Some of the farm ditches were eventually concrete lined.

As part of the Middle Rio Grande Project, the U.S. Army Corps of Engineers was tasked with constructing a flood control dam and reservoir on the main stem of the Rio Grande to protect downstream communities from flooding and water logging of valley lands due to sediment deposition. Over the objections of the Pueblo de Cochiti, the location chosen to build the facility was on Pueblo de Cochiti land. The MRGCD's Cochiti Diversion Dam would be submerged by the new reservoir, as well as some of the Pueblo's prime farm lands. Diversions to the MRGCD system, the East Cochiti Main Canal on the east side of the Rio Grande and the Sile Main Canal on the west side of the Rio Grande, would now be from Cochiti Reservoir.

The construction and impoundment of water in Cochiti Reservoir by the Corps of Engineers proved disastrous to the Pueblo de Cochiti. The rise in water table downstream of the dam caused by the impounded water resulted in the Pueblos' previously fertile farm lands becoming water logged. In some cases, farm fields became lakes. Other farm fields had such a high water table that crops could not be grown. The Pueblo de Cochiti sued the Corps of Engineers and won (settled?), resulting in the construction of a subsurface pipe drainage system to drain the farmlands. However, due to the farm lands being submerged for over 20 years, most of the earthen ditches predating reservoir construction had crumbled. An entire generation lost the farming skills and knowledge that was historically passed on from fathers to sons (parents to children?). Farm equipment had been sold. Traditions of community-wide ditch cleaning in the spring, necessary to maintain and repair ditches, were lost. Because the practice of irrigated agriculture is central to Pueblo culture, its loss had a devastating effect on Pueblo cultural practices, retention of language, (Lee add more)

After construction of the new drainage facilities, some of the old farm ditches were rebuilt with money from the Corps of Engineers settlement. However, funding ran out before all of the old ditches could be repaired or modernized. Also, some concrete lined Pueblo farm ditches were designed and constructed poorly, sloping uphill and being too low relative to the farm fields for proper irrigation.

Changes to laterals and other irrigation facilities resulting from the design and operation of District facilities have led to problems over the years. Poor design on some of the ditches resulted in farm fields being too high relative to the water surface elevation in the supply canal, making irrigation difficult and sometimes impossible. MRGCD, in an attempt to divert less over the years, lowered the water surface elevation of the main canals. There were an insufficient number of check structures on their facilities to enable these reduced diversions and still maintain the water surface elevations necessary for proper irrigation. In some cases, this made turning water out from the main canal to the higher farm ditches and laterals difficult or impossible. A farm enterprise system set up by the Pueblo to farm newly drained fields had to be abandoned (went bankrupt?) because of the failure of MRGCD to supply water at the required elevations. Inadequate or nonexistent maintenance by MRGCD on some of their facilities greatly decreased the water supply available for farming off of some laterals, most notable the Baca and Arquero Laterals.

The Pueblo de Cochiti has partnered with the Bureau of Reclamation, the Natural Resources Conservation Service, and New Mexico State University over the last 11 years to repair and rehabilitate Pueblo irrigation facilities and reinvigorate farming at the Pueblo. In addition, MRGCD concrete lined a portion of the East Cochiti Main Canal running through the Pueblo de Cochiti and installed check structures. The Pueblo de Cochiti also partnered with MRGCD on the reconstruction of the Baca Lateral. New facilities include more modern concrete lined ditches, pressure pipe systems, and high flow turnouts. With changes to terracing, resloping, and laser leveling of farm fields, fewer ditches, pipes, and high flow turnouts are necessary to irrigate the same farm lands (Figure C-3). Far less water is wasted or lost, as the new systems are designed to provide the maximum possible efficiency. New facilities are designed taking into account the crops which will be planted. Education, expertise, and training provided by the NRCS and NMSU have led to more efficient and profitable farming practices, and increase in income to most Pueblo farmers.

Not all of the required repairs and modernization of Pueblo irrigation facilities have been completed to allow the Pueblo to economically and effectively irrigate farm lands in use before the problems caused by Cochiti Reservoir and deficient MRGCD operation and maintenance. Facilities proposed for rehabilitation under this Project will complete the modernization and change to more water-efficient farming that is now underway.

Eligibility of Facilities. Figure C-3 shows eligible irrigation and drainage facilities and irrigated lands on the Pueblo de Cochiti.

Proposed Projects. Some changes have recently been made to the lands in preparation for new pipe systems, high flow turnouts, and concrete lined ditches. Most notably, terracing has been done to allow pipe systems to be installed rather than concrete lined ditch systems. Fields have been laid out in a grid, and smaller fields have been combined to form larger fields. This means that fewer irrigation facilities will be needed, resulting in substantial cost savings. Pipe systems are more water efficient than ditch systems, require less maintenance, and are about one-half to one-third the cost of ditch systems. Where they can be utilized, high-flow turnouts are a fraction of the cost of pipe systems.

Figure C-4 show the location of proposed projects. Table C-1 gives a description and summary in order of priority for the Pueblo de Cochiti. Tables C-2 to C-??? give individual project descriptions.

Adjudications and/or Negotiated Water Rights Settlements. Neither an adjudication nor a settlement of the Middle Rio Grande is underway.

Water Management. The Pueblo de Cochiti has worked in the past with the District on rotation and scheduling during the extreme drought of 2002-2003. The Pueblo de Cochiti works with the District on notifying them of irrigation needs, and cooperates with the District to measure water use on District facilities and one Indian facility, the Baca Lateral, within the Pueblo. The Pueblo de Cochiti will do internal scheduling and rotation as needed off laterals and farm ditches which impact only Pueblo farmers.

Land Ownership. All lands within the Pueblo de Cochiti are owned by the Pueblo. The Pueblo de Cochiti does not have private ownership of its lands. All farmers are assignees. Under current Pueblo regulations, a prospective farmer applies for farmland to the tribal council. It is then granted subject to specific rules. Assignments can be revoked if farming does not begin in a timely manner, and the land assigned to someone else. As the Pueblo remains the landowner, proposed improvements need only the Pueblo's permission, and not that of the individual assignees affected. The Pueblo will work with assignees and notify them of proposed projects affecting their assignments.

There is no limit to the amount of acreage that a farmer can be assigned. In years past, there was a maximum of 10 acres allowed per household. While this is no longer enforced, the Pueblo makes every effort to allow as many individuals as possible to be assigned farm lands. The Pueblo plans to have all lands (with the exception of farm fields subject to rotation or farmer hardship cases) to be farmed either by individual farmers or the Cochiti Environmental Protection Office within one year of the date that improvements are completed.

Checker boarding. All of the Pueblo de Cochiti's proposed projects are entirely within the boundaries of the Pueblo. There are no non-Indian private in holdings within the areas to be improved.

Operation and Maintenance. Operation and maintenance of the facilities is performed by the individual land assignee. Primarily "your ditch or pipe is your responsibility as the farmer", is the designation for land assignees. The Pueblo does major modifications and repair for the entire irrigation system for the Pueblo and land assignees as necessary. These major projects are handled through the Cochiti Department of Natural Resources and Conservation (DNRC). Funding for major projects has been obtained from the Bureau of Reclamation, the US Bureau of Indian Affairs, and the Natural Resources Conservation Services. Major project funding is becoming smaller and more uncertain as time progresses, unless funding can be secured through the New Mexico Pueblos Irrigation Infrastructure Project. The Pueblo is beginning to develop a plan for the management and/or building of a farm budget through farmer payments for lands and services and or cost share as necessary for major projects and O&M in future years.

Cost Share. The Pueblo will provide a cost-share in every project as necessary. Cost share will be reflected through in-kind and monetary work by the land assignee(s) for any work to facilities. The Pueblo does have the option of using annual BIA funds on newly reclaimed facilities as necessary. Cost shares and tax waivers could be ways to increase repair to facilities in future projects.

Utilization of Reconstructed Facilities. The Cochiti Dam has affected the farming in Cochiti in major ways, dislodging a farming know-how from current and future generations. This know-how is essential to farming and maintaining a farming culture for the Pueblo community. The DNRC has been working over the years to reinstitute farming for the members of the Pueblo. The DNRC has instituted a farm program where farmers are afforded services to the farms by Tribal Equipment at low costs, which only

includes bare minimum costs to recover staff time, oils, and gas or diesel. The Pueblo is also working with a number of farm-based outreach organizations, including the New Mexico State University Alcalde extension office, Institute of American Indian Art USDA program, the Bureau of Reclamation, the Natural Resource and Conservation Service, and others to provide farming aid in seed selection and technical assistance in farm and ranching know-how for the Pueblo membership. These efforts have begun to revitalize farming and spark interest where members are awaiting farm improvements to begin farming in assigned areas. The Pueblo has also begun to work with the Tribal council and has instituted some regulations as to land assignment and the use of lands in a timely fashion to ensure all facilities are utilized as soon as they are repaired.

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Table C-1. Pueblo de Cochiti Proposed Projects.

Priority Number	Name	Expected Level of NEPA[1]	Amount to complete NEPA ($)[2]	Amount to complete Study ($)[3]	Amount for Construct-ion ($)[4]	TOTAL NEEDED, STUDY ($)	TOTAL NEEDED, CONSTRUCTION ($)	TOTAL NEEDED, ON-FARM IMPROVEMENTS ($)	Available for On-farm Improve-ments ($)	Available Non-Federal Cost Share ($)
	Herrera Horse Pipe	CEC	$0							
	Sam Arquero Pipe	CEC	$0							
	Watertank Pipe	CEC	$0							
	Vega Pipe	CEC	$0							
	Flour Mill Pipe	CEC	$0							
	Corral North Pipe	CEC	$0							
	Corral South Pipe	CEC	$0							
	Garden Pipe	CEC	$0							
	Steven Herrera Pipe	CEC	$0							
	Arquero Lateral Pipe	CEC	$0							
	Southwest Pipe North	CEC	$0							
	Southwest Pipe South	CEC	$0							
	Southwest High Flow Turnout	CEC	$0							
	Donald Suina Ditch	CEC	$0							
	Triangle Field Ditch	CEC	$0							
	Buffalo Pasture Pipe	CEC	$0							
	West Side Pipe 1 (Mars' Pipe)	CEC	$0							
	West Side Pipe 2 (Aaron's Pipe)	CEC	$0							
	Sile Main Check Structure 1	CEC	$0							
	Sile Main Check Structure 2	CEC	$0							
	Sile Main Check Structure 3	CEC	$0							
	Sile Main Check Structure 4	CEC	$0							
	Sile Main Check Structure 5	CEC	$0							
	Chalan Orchard Pipe	CEC	$0							
	Marcus Chalan Farm Ditch	CEC	$0							
	North Field House Ditch	CEC	$0							
	Costs not assigned to specific project	N/A								
TOTALS			$0	$0	$0	$0	$0	$0	$0	$0
PERCENTAGE OF TOTAL AVAILABLE FOR NON-FEDERAL COST SHARE				%						

[1]CEC indicates Categorical Exclusion Checklist; EA indicates Environmental Assessment; EIS indicates Environmental Impact Statement

[2]$0 means that this item is completed

[3]Study includes aerial surveys, ground surveys, agricultural soils tests, geotechnical soils tests, report writing, database creation, engineering design, specifications, drawings, and cost estimates

[4]Includes costs associated with conducting bids, contract administration, inspection, soils and concrete tests, and other construction associated expenses

Table C-2. INDIVIDUAL PROJECT DESCRIPTION

Priority Number	To be determined
Project Name	HERRERA HORSE PIPE
Project Designation on Figure C-4.	To be determined
Water Supply	MRGCD Sile Main Canal
Service Area	19 acres
No. of Current Assignees	10
Crops to be Grown	Garden crops, alfalfa
Area to be utilized within one year (include fallowed areas if done for soil conservation purposes)	100%
Soil fertility	High
Existing facilities to be replaced	Earthen ditches
Eligibility/Prioritization Checklist	
Are existing facilities being replaced?	Yes
Is there an economic benefit?	Yes
Is there a cultural benefit?	Yes
Is there a water efficiency benefit?	Yes
Is there an improvement in irrigation?	Yes
Potential to address water supply or environmental conflicts?	Yes
Will some or all of the construction have to take place during winter?	Yes
Estimated time to complete construction if funded	2 weeks
Expected or Finished Level of NEPA Compliance	CEC
Is project ready to be constructed (including necessary on-farm Improvements)	Yes

Project Description. The project consists of replacing MRGCD Laterals named the Village Feeder and Trujillo Lateral, one concrete ditch, and five earthen ditches with a PVC pressure pipe system. The new system will service the same farm fields. Ten assignees are currently growing corn and vegetables on these fields. The Village Feeder is a very steep ditch, and makes the water difficult to control at higher flows. The Village Feeder and Trujillo Lateral are rarely maintained by MRGCD. The MRGCD turnouts appear to be over 50 years old. The Pueblo's earthen farm ditches are a continual struggle to maintain. Turnouts are earthen, done by cutting through the ditch berm with a shovel at multiple locations and then repairing the ditch during the course of each irrigation. The fields were originally leveled to irrigate from north to south, but one farmer is irrigating from west to east.

The new project will be a 15-inch diameter, 80 psi PVC pipeline with a 15-inch turnout from the Sile Main Canal. Valves will be spaced at 40-50 ft intervals. The pipeline design flow will be about 7 cfs, and will maximize water use efficiency. Given the crops that will be grown in this area and the high head (difference in elevation) between the water supply and farm fields, a pipe system is the most economical and effective means of irrigating this service area.

The turnout will have to be installed during the winter months when the Sile Main Canal is dry. The rest of the construction can take place at any time of the year, but the preference is for winter construction so as not to interfere with farming during the growing season.

NEPA has already been completed for this project. Engineering designs, drawings, and specifications are complete. Laser leveling (with the associated grid survey) is the only on-farm improvement necessary

for this project. The Pueblo de Cochiti will apply for funding for laser leveling. If funding cannot be obtained, then the Pueblo will laser level these fields as part of the non-Federal cost share.

Cost estimates for construction are dependent on the cost of PVC pipe, which is a petroleum-based product, and is sensitive to fluctuations in the cost of crude oil. Since this project may not be constructed for a number of years after the cost estimate is completed, a 25% contingency for future inflation is built into the cost estimate.

Table C-2. Herrera Horse Pipe Cost Estimate.

NEPA		$0		
Study				
	Survey (Topographic, Design, and Grid for Laser Leveling)	$0		
	Soil Testing	$0		
	Engineering Design (including specifications and drawings)	$0		
	BOR Engineering Review	$0		
Construction				
On-Farm Improvements				
	Laser Leveling			
Available Cost Share				
	From 638 of BIA O&M funds formerly going to MRGCD			
	In-kind services			
	Pueblo funding			
	Individual farmer funding			
Available Cost Share, Percent				