

## EXECUTIVE SUMMARY

### INTRODUCTION

The Pondera County Canal and Reservoir Company (PCCRC) is planning for a major rehabilitation project on the East Dam of Lake Frances. This Executive Summary serves to provide information about the PCCRC, the current condition of the East Dam structure, the recommended alternative and the design basis for providing water to meet the needs of the 80,000 acres of irrigated agricultural lands, as well as the City of Conrad's municipal water supply.

### HISTORY OF THE PCCRC

The irrigation project dates back to the late 1800's when W.G. Conrad and his brother acquired over 50,000 acres of land. They constructed a ditch system in excess of 50 miles in length to provide water for irrigating hay. Their diversions included one out of Lake Frances, near Valier. They sold shares in the company for irrigation of nearly 13,000 acres. The Conrad Brothers sold the company in 1908 when it became an irrigation project under provisions of the 1894 "Carey Act". It was expanded to include land from the Public Domain deemed irrigable.

The PCCRC was originally incorporated in 1909 as the Teton County Canal and Reservoir Company. The Articles of Incorporation were amended in 1927 and its name changed to the Pondera County Canal and Reservoir Company. Construction of the irrigation company was finally completed in 1948, and in 1953 ownership was turned over to the PCCRC.

Since that date, the PCCRC has maintained Swift Dam, 360 miles of canals, hundreds of diversions and two dam structures on Lake Frances, the East Dam and the North Dam for delivery of water to the shareholders of the company.

### CURRENT SITUATION

Today there are approximately 79,840 shares held by 395 shareholders. The owners of these shares irrigated 64,017 acres in 2003. In addition to irrigation supply, the City of Conrad owns 2,180 shares or 2.74% of the total, which is the sole source of municipal water for the City. The irrigated acres of the PCCRC are shown in Figure 1.

The water supply for PCCRC is stored in Lake Frances and released to shareholders, including the City of Conrad through the East and the North Dams. Lake Frances lies directly south of the Town of Valier and 14 miles northwest of the City of Conrad. Lake Frances is an off-stream storage reservoir that is filled by diversion of water from Birch and Dupuyer Creeks. Its capacity is 105,000 acre-feet.

The East Dam, located on the southeast end of the reservoir was originally constructed in 1908-1910. Dam inspections conducted by PCCRC through the years have revealed

game birds. According to Montana Fish, Wildlife and Parks (FWP) biologists, the small island in Lake Frances is home to several Great Blue Heron rookeries and numerous goose nesting sites. The lake is highly used as a rest stop for migratory waterfowl.

The lake itself provides valuable habitat for healthy populations of walleye, Northern pike and yellow perch. Current fish trends from FWP annual sampling efforts show that the number of all principal fish species is quite high relative to historic data. Gill net catches of walleye and Northern pike in 2003 were the highest observed over the last 11 years, as was the relative weight of the fish caught. According to FWP records, angler days on Lake Frances have ranged from 7,500 to nearly 17,500 since 1991.

### **Current and Future Population**

The population for the County as a whole is 6,433, which ranks 32<sup>nd</sup> out of 56 counties in Montana. There are a total of 2,410 households in the County with an average household size of 2.63. The population of Conrad, the County Seat, is 2,681. The only other incorporated municipality in the County is Valier, with a population of 490. Unincorporated municipalities include Brady, Dupuyer, Heart Butte and Ledger. Pondera County is also home to several Hutterite Colonies: Birch Creek Colony, Kingsbury Colony, Miami Colony, and Pondera Colony.

The irrigated lands of the PCCRC are represented by 395 shareholders, or a population of 3,884, including the City of Conrad, which is 58 percent of the total County population. Over the next 20 years, the population of Conrad is projected to be 3,014 making the future population of the PCCRC shareholders about 4,217.

### **Economic Conditions**

The median household income for Pondera County is \$30,464, which is 8.4 percent less than the State median household income of \$33,024. The predominant industry is agriculture, which represents 16.2 percent of the jobs in the County. Government provides a nearly equal number of jobs, followed by retail trade, health care and construction.

According to the USDA Montana Agricultural Statistics, in 2001 and 2002, the total cash receipts for all crops in Pondera County were \$19,086,000 and \$34,655,000, respectively.

### **Historical and Future Crop Production**

According to US agricultural statistics, the number of field crops harvested in Pondera County in 2003 was 306,910 acres, including dry land and irrigated crops. Of those acres, approximately 23 percent are irrigated, 97 percent of which are irrigated by water supplied from the PCCRC.

## EXISTING EAST DAM STRUCTURE

### Description of Existing Facilities

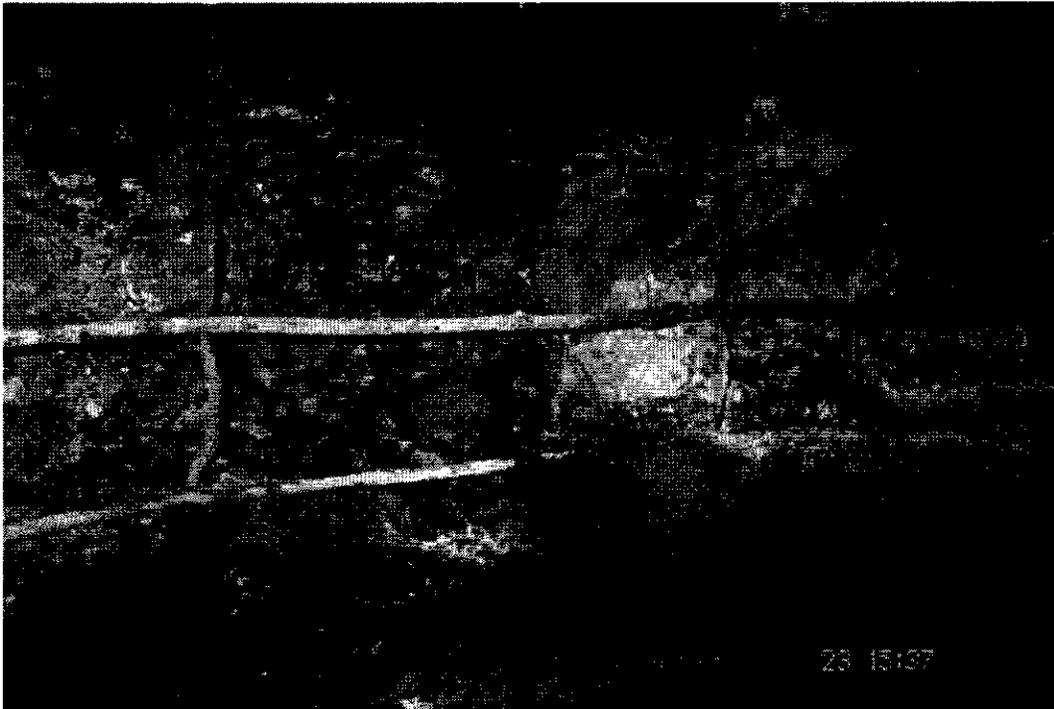
The East Dam specifications are shown in Table 2. As stated previously, the East Dam was constructed in 1908-1910.

<b>TABLE 2 EAST DAM SPECIFICATIONS</b>	
<b>Criteria</b>	
Date Constructed	1908-1910
Dam Type	Earth Fill
Dam Classification	High Hazard
Dam Height	57 feet
Dam Crest Width	20 feet
Dam Width at Base	294 feet
Length of Dam	700 feet
Design Outlet Capacity	950 cfs (currently operated at 450 cfs)
Spillway Capacity	Not Applicable
Reservoir Capacity	105,130 acre-feet

### Operations and Capacity Assessment

Based on the 1998 Dam Inspection and subsequent stability analyses, conclusions about the operations and capacity of the East Dam are summarized as follows:

- Because of the extent of deterioration of the outlet conduit, discharges from the East Dam outlet works are limited to that required for project irrigation demand, approximately 400 to 500 cfs, or roughly half of the original design capacity. Abnormally high reservoir water surface elevations and outlet releases higher than typical irrigation demand would accelerate deterioration of the concrete in the outlet pipe, further limiting its allowable flow rate. Condition of the concrete in the outlet tunnel is shown in Photos 1 and 2 below.
- The outlet works of the East Dam do not meet current dam safety design criteria for adequate draw-down capacity, air vents and cavitation protection, and smooth transition sections in the outlet conduit. The concrete does not meet current dam safety design criteria for strength and the factors of safety for structural design of the outlet are not adequate.



**Photo 2: Exposed Rebar in East Dam Outlet Conduit**



**Photo 3: East Dam Showing Dam Tower (on dam) and Reservoir Gate Tower (right)**

1. Develop Alternative Storage Sites
2. Develop Alternate Water Sources
3. Scale Down the Irrigation Project

**Alternative 1: No Action**

The “No Action” alternative involves deferring any capital improvements or operational changes to the existing dam to some time in the future. The consequence of this alternative, however, is continued risk to public health, public safety, and private property and potentially severe water restrictions during the summer; the loss or decrease in irrigation supply to about 395 farms within the PCCRC. Because this alternative does not address the problem, is not recommended and will not be considered further.

**Alternative 2: Construct a New Dam and Outlet Works Downstream of the Existing Dam**

This alternative would involve replacement of the existing dam and outlet works with a new structure located immediately downstream from the existing dam. Components of this alternative include:

1. New dam embankment
2. New embankment core wall
3. New gate control towers
4. New outlet conduit
5. New outlet stilling basin

**Alternative 3: Rehabilitate Existing Outlet Works**

This alternative would involve rehabilitation of the existing outlet works including both dam and reservoir gate towers and the outlet conduit. Work completed to date has discovered that the strength of the concrete is low and structural integrity of the dam towers is questionable. Therefore, this alternative is not recommended at this time.

**Alternative 4: Rehabilitate Existing Dam and Replace Outlet Works**

This alternative would include rehabilitation or replacement of the existing dam embankment and replacement of the existing outlet works by removing the existing outlet conduit and gate towers and constructing a new outlet conduit and gate towers.

income of the company. The operation and maintenance budgets for the past five years are shown in Table 4.

Year	Operating Income	Expense & Depreciation	Net Profit (Loss) From Operations
1999 – 2000	\$878,303	(\$906,608)	(\$28,305)
2000 – 2001	\$947,527	(\$956,459)	(\$8,932)
2001 – 2002	\$907,548	(\$1,006,556)	(\$99,008)
2002 – 2003	\$1,238,068	(\$1,253,748)	(\$15,680)
2003 – 2004	\$1,082,169	(\$1,131,737)	(\$49,568)

Table 5 provides a summary of the notes payable currently held by the PCCRC. Reserves for the two notes are required and total \$96,562.

Note	Amount	Annual Payment	Date Issued	Maturity Date
Water Development Loan	\$555,000	\$52,972	1988	2009
Renewable Resource Program Revenue Bonds	\$400,000	\$40,886	1994	2009

Revenue for financing the East Dam Rehabilitation project would be generated through the maintenance fees assessed annually to share holders. Prior to 2003, the maintenance fees had been \$11.25 per share. In 2003, the maintenance fee was increased to \$14.25 per share, with \$8.50 going to operation and maintenance and \$5.75 going into the watershed fund, which is used for capital improvements to the irrigation system infrastructure. It is anticipated that the maintenance fee for 2005 will be increase by \$0.50 per share to \$14.75 per share to cover additional operation and maintenance fees.

For an average shareholder with approximately 400 shares, the anticipated annual cost would be \$5,900. The City of Conrad is the second largest shareholder with 2,180. The anticipated annual cost to the City for PCCRC maintenance fees would \$32,155.

### **Funding Sources**

For the PCCRC, a privately-owned, non-profit organization, there are only a few potential sources of revenue available to finance the rehabilitation of the East Dam.

<b>TABLE 6 COST OF FINANCING EAST DAM REHABILITATION</b>				
<b>Cost</b>	<b>0% Grant</b>	<b>25% Grant</b>	<b>50% Grant</b>	<b>75% Grant</b>
Total Cost of Project	\$5,900,000	\$5,900,000	\$5,900,000	\$5,900,000
Total Grant Amount	\$0.00	\$1,475,000	\$2,950,000	\$4,425,000
Total Cost to Be Financed	\$5,900,000	\$4,425,000	\$2,950,000	\$1,475,000
<b>Total Annual Cost</b>	<b>\$617,135</b>	<b>\$462,851</b>	<b>\$308,568</b>	<b>\$154,284</b>
Annual Increase to Shareholder with 400 Shares	\$3,100	\$2,325	\$1,550	\$775

Without any grant, the average PCCRC shareholder with 400 shares would be required to pay an additional annual cost of \$3,100 for 20 years on top of their 2005 anticipated annual assessment of \$5,900. The annual increase to the City of Conrad would be an additional \$16,893 above their anticipated annual assessment of \$32,155.