

Exhibit E - Operation and Maintenance Report

COLORADO RIVER RECOVERY PROGRAM
FY 2011 ANNUAL PROJECT REPORT
PROJECT NUMBER:116/C33

RECOVERY PROGRAM

I. Project Title: Operation and Maintenance of the Fish Screen and Maintenance of the Fish Passage Facility at the Redlands Water And Power Company Diversion Dam

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III. Project Summary: The Redlands Water and Power Diversion, located on the Gunnison River near Grand Junction, CO, diverts water into the Redlands Power Canal. A fish passage structure was constructed around the diversion dam in 1996. A fish screen and fish return pipeline was constructed in the canal in 2004. The fish passage is operated by the US Fish and Wildlife Service. Redlands operates and maintains the fish screen and performs maintenance on the fish passage.

IV. Study Schedule: Redlands makes every effort to operate the fish screen whenever diverting water into Power Canal. Maintenance on the fish passage is performed after the US Fish and Wildlife Service completed annual operation.

V. Relationship to RIPRAP: Colorado River Action Plan: Mainstem II.B.3.

VI. Accomplishment of FY 2010 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

The following major maintenance activities were completed on the fish passage.

- 1) Refer to US Fish and Wildlife Service. Bob Burdick
- 2) Redlands Water and Power cooperated with FWS on maintenance

The following improvements were made to the fish passage:

- 1) Refer to US Fish and Wildlife Service. Bob Burdick
- 2) Redlands Water and Power cooperated with FWS on maintenance

The fish screen was operated during the following periods

- | | | |
|-------------|---------|---|
| 1) online | 4-1-11 | Inside screen bottom is clean with no sand |
| 2) bypassed | 4-3-11 | Screens plugged with sticks and grass. Brushes stuck and would not move |
| 3) online | 4-6-11 | Online in Manual |
| 4) bypassed | 4-11-11 | Discharge pipe to river plugged. Close gate at river to dislodge debris. |
| 5) online | 4-11-11 | |

| | | |
|--------------|---------|---|
| 6) bypassed | 4-21-11 | Brushes stuck would not move. Flush inside screens with water flows. Air compressor controller issues. |
| 7) online | 5-17-11 | Online in Auto |
| 8) bypassed | 6-15-11 | Screens plugged. Air compressor controller issues. |
| 7) online | 6-22-11 | Online in Auto |
| 8) bypassed | 6-23-11 | Screens plugged. Troubleshoot Automation problems. |
| 9) online | 6-29-11 | Online in Auto |
| 10) bypassed | 7-17-11 | Screens plugged. Air compressor controller issues continue from spring. |
| 11) online | 7-20-11 | Replace brushes on brush arms. |
| 12) bypassed | 8-16-11 | Discharge plugged. |
| 13) online | 8-17-11 | Discharge gate was vibrating closed and trapping debris. Handle chained & locked. |
| 14) bypassed | 9-27-11 | Screens plugged with very small rocks. Inside bottom of screen has two plus feet of sand over 60 % of area. Air nozzles had been lifting/stirring sand up and trapping it in the screens. |

The following major maintenance activities were completed on the fish screen:

- 1) Complete service on air compressor increased to twice per season
- 2) Complete service on trash rake
- 3) Replaced brush drive motors and gear boxes with more suitable units.
- 4) Completed conversion to new Automation program.
- 5) Continued daily log book and maintenance log entries.
- 6) Completed Industrial Electricity and Hydraulic Systems training for Mark Sievers.

The following improvements were made to the fish screen:

- 1) Added carport over top of Automation control area.

VII. Recommendations:

- 1) Add water flow meter to discharge pipe.
- 2) Add manhole or cleanout in discharge line for power cleaning.
- 3) Add concrete apron on East edge of trash rake to aid in debris removal.

- 4) Add water level sensors below Fish screen to regulate water level in canal accurately when in bypass mode.
- 5) Clean settling basin above fish screen to allow sand to be trapped before entering the fish screen.

VIII. Project Status: On schedule and on budget.

IX. FY 2010 Budget Status

- A. Funds Provided: \$85,000* (2009)
- B. Funds Expended: \$ *(RWP)

See attached FY2010 Invoice summary for detail of expenditures by activity.

X. Status of Data Submission (Where applicable): Not applicable

XI. Signed: Kevin E. Jones November 14, 2011
Principal Investigator Date

Summary:

The 10-1- 2010 through 9-30-2011 season was frustrating and did not measure up to RWP goals for the operation of the fish screen. The high runoff which gave us heavy debris loads and muddy water well into August made operations difficult at best. We are working on plans to clean the canal above the fish screen and build in some traps to prevent sand from entering the screen area. Unfortunately any traps will have to be cleaned out with machines and hauled away resulting in extra costs to the fish screen.

On the plus side the automation worked out very well towards the end of the season as we were able to work the startup issues out. The automation will save much wear and tear on the equipment at the fish screen facility by reducing run times. The sand which settled inside the screen area will have to be mechanically removed with a skid steer and a crane and the screens will be cleaned with small grinders and stainless steel brushes. The air nozzles will be changed to eliminate the agitation of the sand which resulted in plugged screens.

There have been difficulties and a definite learning curve to the operation of the fish screen but we have also welcomed many improvements and successes. RWP looks forward to a successful 2011-2012 season with more time online for the fish screen. We have hundreds of pictures from the last several years of the fish screen and fish passage available to share.