MEMORANDUM

FROM: Neal P. Dixon

TO: File

DATE: September 22, 1986

RE: Scope of Work for a Study of the River Mechanics of the Sacramento River in the Vicinity of the GCID Pump Station and CDF&G Fish Screen

PROJECT: R3013.A0

INTRODUCTION

Glenn-Colusa Irrigation District (GCID) and California Department of Fish and Game (CDF&G) are interested in funding a study of the mechanics and morphology of the Sacramento River in the Hamilton City-Woodson Bridge reach to determine probable future conditions of the the river at the GCID diversion.

The pumping station operated by GCID and fish screens operated by CDF&G at the GCID pump station intake are experiencing problems as a result of degradation of the Sacramento River bed in the vicinity of the diversion. Since 1970, the river bed has dropped approximately 3 feet at the mouth of the pump station intake channel. This degradation appears to have been related to significant channel shortening in the reach from Hamilton City to Woodson Bridge during this period.

The pump station will operate satisfactorily at existing river levels under all but low flow conditions. If the river can be expected to continue at or above present levels, improved maintenance of the intake channel and some minor channel improvements may be all that is necessary to assure pump station operability. Further decrease in river elevation, however, will require some significant action on the District's part to assure their ability to divert at design capacity under low flow conditions.

The fish screen, on the other hand, is not working properly under current conditions. Consideration is presently being given to the modification of the screens so they will work effectively at lower water surface elevations. Before definite plans can be drawn up, however, it is important that the probable future river movements be anticipated and taken into account.

Proper operation of the fish screens also requires adequate bypass flows to carry fish removed from the diverted flow safely back to the river. The differential in water surface elevation between the mouth of the intake channel and the point of bypass return is a central factor in providing for this return flow.

WORK SCOPE

Questions to be addressed during the course of the study are listed below.

- Primary emphasis is on the definition of probable future changes in river elevation, gradient, and geometry in the vicinity of the GCID diversion. This evaluation should consider historical information on behavior of the river, flow regime, river bed and bank characteristics, cultural activities on the river banks, existing and planned channel maintenance works, and other pertinent factors.

The following items are of secondary concern:

- What would be the effect on the mechanics of the river of installing a removable barrier (fabridam, or bascule gate) just downstream from the mouth of the intake channel? The barrier would be raised only during periods of relatively low flow (say 10,000 cfs or less).

- What would be the effect on river mechanics of a series of permanent wing dams or groins downstream from the mouth of the intake channel? The wing dams would be intended to raise the river water surface at the mouth of the GCID intake channel approximately 2 to 3 feet, and would remain in place permanently.

- What could be done to reduce sediment deposition in the GCID intake channel?

The consultant will be responsible for obtaining all information needed to carry out the investigation.