State of California

The Resources Agency

Memorandum

Date : October 29, 1985

To : 1. Bob Potter
2. Arthur Gooch
3. Bob Whiting
4. David Kennedy

From : Ray Hoagland
Department of Water Resources

Subject: Changing the Discount Rate

Your approval is requested to change the Department's existing discount rate and related policy. The last such change was made in June 1982 and tied the Department's rate to that used by federal water agencies. Currently, that rate is 8-5/8 percent.

A formal review of the discount rate was undertaken as part of the sizing and cost allocation aspects of the Los Banos Grandes investigation. This coincided with the views of an increasing number of analysts within the Department questioning the appropriateness of the federal rate. The result of the review, along with recommendations, is summarized below.

Because of the nature of water projects as economic investments, DWR discount rates are appropriately derived from the yields* of taxable, long term, low risk securities, both public and private. In recent months the average yields for these securities have been in the 11 to 12 percent range. These yields reflect investors' expectations for long-term inflation, as well as perceptions about risk and other factors. Generally, Department economic studies, as well as studies by federal agencies, are made in terms of constant (i.e. inflation-adjusted) dollars. As a consequence, the discount rate used must be an inflation-adjusted rate.** (The inflation-adjusted rate is called a real discount rate; unadjusted, it is called a nominal discount rate.)

At this time, the most reasonable estimate for average long term inflation is 5 percent. Multiplying the nominal factor of 1.115 (corresponding to the midpoint of the 11 to 12 percent range cited above) by the inflation adjustment factor of 1/1.05 gives a factor of 1.062. This latter

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* Yields, as opposed to interest rates at issue, are determined by the resale value of bonds.

** Economic analyses are not to be confused with financial repayment analyses which are shorter-term and are based on inflated dollars and the interest rates at issue of tax-free bonds.

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factor corresponds to a rate of 6.2 percent. On this basis, 6 percent* is recommended as the real discount rate to be assumed for Department economic analyses. If it is required that an economic study be done in terms of inflated dollars for a specific reason, then an 11 percent* nominal discount rate should be used.

A word about the federal discount rate. Federal criteria specify that the rate will be adjusted annually based on "...the average yield during the proceeding Fiscal Year on interest-bearing marketable securities of the United States which, at the time of the computation is made, have terms of 15 years or more remaining to maturity...". Based on rates of return over the past year, this would suggest a discount rate in the neighborhood of 11 percent. However, the federal criteria also state that "in no event shall the rate be raised or lowered more than one-quarter of one percent for any year". As a consequence, the current federal discount rate of 8-5/8 percent does not reflect "full" rates of return on United States securities nor is it a real rate adjusted for inflation. It is felt that the gap between the federal rate and either a real rate or the going rate on securities warrants a departure from federal criteria.

In view of the above, it is recommended that:

1. The Department adopt a 6 percent discount rate for use in its planning studies. Said rate is to be considered a "real" rate that is, a rate that has been adjusted for inflation. Future benefits and costs would be projected in constant dollars (no increase due to inflation).

2. In the event that inflation is included in the analysis, a 5 percent inflation rate will be assumed. Future benefits and costs will be factored up at this rate. The appropriate "nominal" discount rate would include inflation and be 11 percent. (In effect, for long term planning purposes, a 6 percent real rate is equivalent to an 11 percent nominal rate.)

3. These discount rates would not apply to cooperative studies with the Federal Government if it was decided that federal criteria would be used.

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* Rounded for computational convenience

4. Due to the many uncertainties surrounding the factors influencing the determination of discount rates and long term inflation rates, the Department's policy shall be reviewed annually.

RECOMMEND APPROVAL:

Arthur Gooch, Chief
Division of Planning

Date: 11/4/85

RECOMMEND APPROVAL:

Robert E. Whiting
Deputy Director

Date: 11/4/85

APPROVED:

David N. Kennedy
Director

Date: 11-5-85