

assure that such standards will be equitable, workable, and enforceable." The practicable approach set out in your statement will be welcomed by all those throughout the Basin who have been concerned about this problem over the last 2 or 3 years. As you know, many throughout the Basin have been quite upset by statements and positions taken by some of your subordinates.

Now, Mr. Secretary, my only comment on your discussion of the Indian water rights, other than emphasizing to the members of the committee the sizable amounts of water involved and the priority given these rights, has to do with the question of the difference between the diversion amounts and the estimated consumptive use. My concern goes beyond the use of water on the Indian reservations; it goes to the determination of return flow throughout the entire Basin. Your staff has already been alerted as to my request for information on this matter. I hope that someone is in a position to give the committee a brief discussion on how the Bureau makes these determinations.

Are you prepared to do that?

Secretary UDALL. Commissioner Dominy would like to address himself to that.

Mr. DOMINY. Return flows from irrigation developments consist of surface water returns which, when collected in drainage facilities, can be measured. They consist of underground returns which mingle with natural underground flows and can't be positively identified. Thus, it is seldom, if ever, possible to get a complete measurement of all return flows. However, procedures have been developed which, by processes of deduction, give highly reliable estimates of return flows.

The quantity of water diverted for irrigation can be accurately measured and is being accurately measured. The effective rainfall over the growing season can be measured and is being accurately measured, which, together with the diverted water, comprises the water available to grow crops.

A great deal of research, primarily by the Department of Agriculture, has gone into the determination of the consumptive use requirements of various crops under varying soil and climatic conditions. In this research, large tanks are filled with soil. Crops are grown in these tanks under conditions which permit the most precise determination of water application and water use requirements—consumptive requirements of the plant.

Reliable consumptive use figures, not only for crops but for non-crop vegetation, are thus derived for varying climatic conditions and from such research, the widely used Blaney-Criddle method of estimated consumptive use has been developed.

When all estimated consumptive uses are subtracted from the total water available, the remainder must constitute return flow. Some of this return flow which percolates through the ground may take extensive periods to reach the main stream. The theoretical estimates are checked periodically by the Bureau of Reclamation and the most recent studies involved operations on the Rio Grande project in New Mexico and Texas and on the North Platte project in Wyoming and Nebraska, which are two of our oldest projects. The actual measurements of surface return flow at these two projects over several years,