

TR-146

Water Rights Analysis Package (WRAP) Model Description and User's Manual

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The evolution of the Water Rights Analysis Package (WRAP) is outlined in the "Model Development Background" section of Chapter 1 of this report. The model was developed in conjunction with a series of university research projects sponsored by the Texas Water Resources Institute, U.S. Geological Survey, Brazos River Authority, Texas Advanced Technology Program, Texas Water Development Board, and Texas Natural Resource Conservation Commission. W. Brian Walls, David D. Dunn, Anil R. Yerramreddy, and Gerardo Sanchez-Torres addressed various aspects of model development and application in their thesis and dissertation research as graduate students in the Civil Engineering Department at Texas A&M University. The revised October 1996 as well as the original March 1993 editions of this report document a modeling package consisting of three computer programs called WRAP2, WRAP3, and TABLES. The October 1996 edition of the software and documentation reflect the following revisions to the March 1993 version.

- A watershed flow option has been added to WRAP2 and WRAP3 to supplement the control point approach for defining the location of system components and inputting naturalized streamflows. Flows at water right locations are computed as a function of the flows at control points provided as input. A flexible methodology is incorporated in the model that allows streamflows at water rights sites to be expressed as a function of control point flows optionally using information ranging from simple drainage area ratios to more complex relationships.
- Dimension limits were changed to increase the maximum number of control points from 50 to 200. The maximum number of water rights and reservoirs was decreased from 2,000 to 1,700. The new watershed flow option allows up to 200 water rights sites in addition to the control point locations. Any of the dimension limits can be easily changed in the future as needed for particular applications.
- Minor revisions to program TABLES include adding means in most of the tables and refining several headings.
- Numerous minor refinements were made throughout this report to update or clarify the presentation.

- "Appendix G: Guidelines for Developing WRAP Input" is a new addition to the report.

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