DOCUMENTATION OF MODEL INPUT AND OUTPUT VALUES FOR THE SIMULATION OF THE GROUND-WATER FLOW SYSTEM AND PROPOSED WITHDRAWALS IN THE NORTHERN PART OF VEKOL VALLEY, ARIZONA

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ABSTRACT

This report and the attached 3 1/2-inch diskette contain, in compressed format, the data sets for the model of ground-water flow in the Northern part of Vekol Valley. The data sets can be uncompressed using a program provided with this report. The uncompressed files require approximately 3.1 megabytes of disk space on an IBM-compatible microcomputer using the MS-DOS operating system, and all files are presented according to the American Standard Code for Information Interchange.

INTRODUCTION

A four-layer digital model of the ground-water flow system was developed as part of a study of the northern part of Vekol Valley, Arizona, using the MODFLOW program by McDonald and Harbaugh (1988). Results of the Vekol Valley study are described in a report by Hollett and Marie (1986). Although that report summarizes the data input to the model, detailed documentation of grid location, model input, and sample output has not been published previously. This report, which is a supplement to the report by Hollet and Marie (1986), provides detailed, electronic documentation of the model data.

MODEL GRID

Organization of the model grid was based on a composite of U.S. Geological Survey topographical maps, which are identified in Figures 1 and 2 of Hollett and Marie (1986). For model-grid orientation, the intersection of the right edge of column 6 and top edge of row 4 is located about 50 ft. southwest of the intersection of sections 16, 17, 20 and 21 in Township 6 South and Range 1 East (Hollett and Marie, 1986, fig. 8). The model grid is oriented with rows of model cells aligned in the east-west direction and columns of model cells aligned in the north-south direction.

INPUT AND OUTPUT FILES

The original input and output files for the Vekol Valley flow model were developed on a Prime[1] computer and transferred to an IBM-compatible microcomputer (operating under MS-DOS version 3.3). The files were then compressed so that they could be placed on a single diskette. The compression program produced a single file that contains all input and output files.

The diskette included with this report contains a copy of this text (README.DOC), the library of compressed files (VEKOL.ZIP), and the decompression program (PKUNZIP.EXE). The decompression program is provided by PKWARE, Inc., 7545 North Port Washington Road, Glendale, Wisconsin. Permission to copy PKUNZIP is granted freely, provided all copies acknowledge and reference the authors and distributors of the program PKUNZIP.exe. The library can be decompressed by typing PKUNZIP followed by the library name VEKOL.ZIP and

1. Use of trade name in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

pressing enter. The decompressed files will be the same as the original Prime computer files and will consist of text characters represented according to the American Standard Code for Information Interchange (ASCII).

Files for the Vekol Valley model are on a high-density, double-sided, soft-sectored, 3 1/2-inch diskette with a capacity of 1.44 megabytes. The root directory on the diskette contains three files: (1) README.DOC, (2) the decompression program PKUNZIP.EXE, and (3) the compressed file VEKOL.ZIP that contains all the input and output files for the Vekol Valley flow model. The compressed file VEKOL.ZIP will unconcompress and form all input and output files.

The MODFLOW ground-water model program runs on a variety of computers, but procedures for opening input data files are different for different computers, operating systems and Fortran compilers. This report does not address procedures for compiling the MODFLOW program or opening the model data sets on specific Fortran units.

Two simulations were made using the model: steady-state simulation and a transient simulation that is a projection of the system response to a proposed withdrawal plan. Input files for the steady-state and transient simulations are listed in table 1. Record lengths of the input files are 80 or fewer characters. There are two output files: the steady-state simulation output is file VEKSS.OUT, whereas the transient output is file VEKTRN.OUT. Each record on the output file contains 132 or fewer characters. Data contained in the files are in units of feet and days.

Table 1. File name, Fortran unit number, file size, and description of input data sets for the Vekol Valley, Arizona, ground-water flow model

File name	Fortran unit	Size (Bytes)	Description of file
bas.ss	1	90962	Basic package data for steady-state simulation
bcf.ss	11	89749	Block-centered flow package data for steady-state simulation
drn.ss	13	1646	Drain package data for steady-state simulation
rch.ss	18	3625	Recharge data for steady-state simulation
sip.ss	19	74	Strongly implicit procedure package data for steady-state simulation
bas.trn	1	91731	Basic package data for transient-state simulation; starting heads are the ending heads from steady-state simulation
bcf.trn	11	125495	Block-centered flow package data for transient simulation
wel.trn	12	4210	Well package data for transient simulation
drn.trn	13	1742	Drain package data for transient simulation
rch.trn	18	3716	Recharge data for transient simulation
sip.trn	19	74	Strongly implicit procedure package data for transient simulation

REFERENCES CITED

Hollett, K. J. and Marie, J. R., 1986, Simulation of the ground-water flow system and proposed withdrawals in the northern part of Vekol Valley, Arizona: U.S. Geological Survey Water-Resources Investigations Report 86-4340, 68 p.

McDonald, M. G. and Harbaugh, A. W., 1988, A modular three-dimensional finite-difference ground-water flow model: U.S. Geological Survey Techniques of Water-Resources Investigations, Book 6, Chapter A1, 586 p.