Documentation of Model Input and Output Values for Simulation of Regional Ground-Water Flow, Carbonate-Rock Province, Nevada, Utah, and Adjacent States

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By Donald H. Schaefer

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DISKETTE

(In pocket at back of report)

High-density, double-sided, soft-sectored, 5-1/4-inch diskette with text, input, and output files

CONVERSION FACTORS

Multiply	*By*	*To obtain*
inch (in)	2.540	centimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer

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ABSTRACT

Documentation of model input values and sample output used during a conceptual evaluation of the regional ground-water flow in the carbonate-rock province of the Great Basin, Nevada, Utah, and adjacent states, has not been published previously. In this report, the documentation, consisting of a listing of input values and sample output, is contained on a 5-1/4-inch diskette in files presented in American Standard Code for Information Interchange (ASCII) format. These files require approximately 220,000 bytes of disk space on an IBM-compatible microcomputer using the MS-DOS operating system.

INTRODUCTION

Ground-water flow in an area composed of basin fill and underlain by carbonate rock in western Utah, eastern Nevada, and small parts of Arizona, California, and Idaho was studied as part of the U.S. Geological Survey's Great Basin Regional Aquifer-System Analysis (RASA; Harrill and others, 1983). A two-layer digital model was developed for the eastern part of the Great Basin, using a computer program written by McDonald and Harbaugh (1988). Results of the modeling effort are given by Burbey and Prudic (1991).

Although the report by Burbey and Prudic (1991) summarizes the data input to the model, a detailed description of grid location, a listing of model input values, and sample output have not been published previously. The purpose of this report, which is a supplement to the report by Burbey and Prudic (1991), is to provide a more detailed documentation of the model.

MODEL GRID

Organization of the model grid was based on a composite of U.S. Geological Survey base maps for Arizona, California, Idaho, Nevada, and Utah. The model grid is oriented northeasterly, parallel to the prevailing trend of fault-block mountains and adjacent valleys in the area (Burbey and Prudic, 1991, p. 17). The grid network contains 60 columns, 62 rows, and 2 layers. The width of each cell (in the row direction) is 5.0 mi. The length of each cell (in the column direction) is 7.5 mi. The latitudes and longitudes of the four corners of the grid (beginning at the origin of the grid at the northwestern corner and continuing in a clockwise direction) are as follows.

Corner	North latitude	West longitude
Northwest	42° 7′ 30"	117° 2′ 45"
Northeast	41° 22′ 31"	111° 17′ 9"
Southeast	34° 49′ 20"	112° 57′ 50"
Southwest	35° 30′ 26"	118° 14′ 32"

INPUT AND OUTPUT FILES

The original input files and output for the flow model were developed on a Prime computer and transferred to an IBM-compatible microcomputer (operating under MS-DOS version 3.3). Files on the diskette are the same as the original Prime computer files and are presented in American Standard Code for Information Interchange (ASCII) format.

Although the model program can be used on a variety of computers, the input files might have to be reorganized depending on the specific computer and compiler being used. The computer program is written in Fortran 77.

The input files and the sample output are on one high-density, double-sided, soft-sectored diskette with a capacity of 1.2 megabytes. The root directory on the diskette contains one file (README.DOC, which is a copy of the printed text of this report) and two subdirectories (INPUT and OUTPUT). Tables 1 and 2 show the contents of the subdirectories INPUT and OUTPUT and descriptions of the files. Data contained in the files are in units of feet and seconds, except as noted. Record lengths of the input files are shown in table 1. The record length of the model output is 132 characters.

TABLE 1.--*Model-input files, Fortran units, maximum record lengths, sizes, and descriptions*

[IBOUND, variable showing status of model cell]

File	Fortran unit	Maximum record length (characters)	Size (bytes)	Description
BASIC.DTA	5	*(1)*	472	Basic input data
DRAIN.DTA	20	*(1)*	1,593	Regional spring data
BCF.DTA	15	*(1)*	286	Block-centered-flow data
EVTRATE.DTA	49	*(1)*	11,532	Evapotranspiration rate over grid
EVT.DTA	29	*(1)*	180	Evapotranspiration data
GHB.DTA	50	*(1)*	4,991	General-head-boundary data
SHEAD.TOP	32	*(1)*	15,624	Starting heads, top layer
SHEAD.BOT	33	*(1)*	15,624	Starting heads, bottom layer
TRANS.TOP	35	*(1)*	23,064	Transmissivity, top layer
TRANS.BOT	38	*(1)*	11,532	Transmissivity, bottom layer
IBOUND.TOP	30	*(1)*	11,532	Boundary, top layer
IBOUND.BOT	31	*(1)*	11,532	Boundary, bottom layer
OC.DTA	19	*(1)*	126	Output control data
RECH.DTA	17	*(1)*	19,430	Recharge data (areal recharge)
SIP.DTA	18	*(1)*	74	Strongly implicit procedure data
LSELEV	48	*(1)*	19,344	Land-surface elevation
VCONT	36	100	37,943	Vertical hydraulic conductivity and vertical grid spacing
Total			184,879	

[1] Record length is 80 characters or less.

TABLE 2.--*Sample-output file, Fortran unit, size, and description*

File	Fortran unit	Size (bytes)	Description
CARB.LST	6	34,520	Output for steady-state simulation

REFERENCES CITED

Burbey, T.J. and Prudic, D.E., 1991, Conceptual evaluation of regional ground-water flow in the carbonate-rock province of the Great Basin, Nevada, Utah, and adjacent states: U.S. Geological Survey Professional Paper 1409-D, 87 p.

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