ASCE Manuals and Reports on Engineering Practice No. 85

Quality of Ground Water

Guidelines for Selection and Application of Frequently Used Models

ASCE

AMERICAN SOCIETY OF CIVIL ENGINEERS

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Guidelines for Selection and Application of Frequently Used Models

Prepared by the Committee on Ground Water Quality of the
Environmental Engineering Division of the
American Society of Civil Engineers

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ABSTRACT:

The Task Committee on Contaminated Ground Water Modeling was approved in September 1990 by the Executive Committee of ASCE's Environmental Engineering Division with the express purpose of assessing widely used models of contaminated ground water. In order to accomplish this, the committee first surveyed the professional community to determine which models are in frequent use; it then classified these models according to a unified set of criteria that they had developed. Based on these criteria, the task committee created guidelines for the application of the models that include the capabilities and limitations of each model. This monograph represents the valuable information compiled by this task committee.

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85 Quality of Ground Water
86 Operation and Maintenance of Ground Water Facilities
87 Urban Runoff Quality Manual
88 Management of Water Treatment Plant Residuals
89 Pipeline Crossings

FOREWORD

The Task Committee on Contaminated Ground Water Modeling was approved in September 1990 by the Executive Committee of ASCE's Environmental Engineering Division. The task committee was formed with the express purpose of assessing widely used models of contaminated ground water. Udai P. Singh of CH2M Hill initiated the formation and activities of this task committee and served as the contact member of the Executive Committee through the publication of this monograph. In 1992, this task committee was named as the Division's Ground Water Quality Committee.

The two principal objectives of this committee have been to: (1) survey the professional community to determine which models are in frequent use, and classify those models according to a unified set of criteria developed by this task committee, and (2) develop guidelines on the application of these models that describe capabilities and limitations. This monograph presents the valuable information that the committee has compiled.

The original task committee was organized into five groups, led as follows:

- C. Harold Emmett, Jr., P.E., ATSDR: Task I. Conduct a survey of professionals to determine which ground water quality models are in frequent use.
- Lakshmi N. Reddi, Ph.D., P.E., Kansas State University: Task II. Develop criteria for classifying the models.
- R. Lee Peyton, Jr., Ph.D., P.E., University of Missouri-Columbia: Task III. Review, evaluate, and classify the models.
- Bijay K. Panigrahi, Ph.D., P.E., P.G., Remedial Engineering & Science, Inc.: Task IV. Document input parameter requirements and implementation guidance.
- Ashok Pandit, Ph.D., P.E., Florida Tech: Task V. Summarize model capabilities and limitations.

Other committee members who significantly contributed to the preparation of this monograph include:

- Abnish C. Amar, Ph.D., P.E., Entech Engineers, Inc.
- Brenton M. Hamil, P.E., Florida Department of Transportation
- Charles S. Hebson, Ph.D., P.E., Robert G. Gerber, Inc.
- James H. Jensen, P.G., PEER Consultants
- Daniel E. Medina, Ph.D., P.E., Northeastern University
- R. Kerry Rowe, Ph.D., P.E., University of Western Ontario

The final draft, based on four years of effort, was reviewed for the Society by an independent Blue Ribbon Panel consisting of:

- Charles B. Andrews, P.E., S.S. Papadopulos & Associates, Inc.
- Chester R. McKee, Ph.D., P.E., In Situ, Inc.
- Miguel A. Medina, Ph.D., P.E., Duke University
- James W. Mercer, P.G., Geo Trans, Inc.

Model developers who commented on the final draft included R. Kerry Rowe of the University of Western Ontario, Leonard F. Konikow of the U.S. Geological Survey, Thomas A. Prickett of Thomas Prickett & Associates, Milovan S. Beljin of the University of Cincinnati, Clifford I. Voss of the U.S. Geological Survey, Chunmiao Zheng of the University of Alabama, Sumant Gupta of CH2M Hill, and Brendan M. Harley of Camp, Dresser and McKee, Inc. Steven C. McCutcheon, P.E. of the USEPA Environmental Research Laboratory in Athens, Georgia edited the final manuscript. The standing committee integrated all comments into the final version of the report.

Sayed M. Sayed, Ph.D., P.E., Chair
Committee on Ground Water Quality

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