'REG/CR-3328
.ND83-1159
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Printed August 1986

Theory and Implementation for SWIFT II

The Sandia Waste-Isolation Flow and Transport Model for Fractured Media

Release 4.84

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Prepared by
Sandia National Laboratories
Albuquerque, New Mexico 87185 and Livermore, California 94550
for the United States Department of Energy
under Contract DE-AC04-76DP00789

repared for
. S. NUCLEAR REGULATORY COMMISSION
900C:S 81)

non-circ.

NUREG/CR-3328
SAND83-1159
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THEORY AND IMPLEMENTATION FOR SWIFT II THE SANDIA WASTE-ISOLATION FLOW AND TRANSPORT MODEL FOR FRACTURED MEDIA RELEASE 4.84

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operated by
Sandia Corporation
for the
U.S. Department of Energy

Prepared for
Division of Engineering Safety
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Under Memorandum of Understanding DOE 40-550-75
NRC FIN No. A1266

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ABSTRACT

This report is one of two that describe the three-dimensional finite-difference code SWIFT II. This code is used to simulate flow and transport processes in geologic media that may be fractured and was developed for use in the analysis of deep geologic nuclear waste-disposal facilities. However, it may be used in other areas such as waste injection into saline aquifers and heat storage in aquifers. Both dual-porosity and discrete-fracture conceptualizations may be considered for the fractured zones. In order to maximize computer efficiency, only one-dimensional migration is permitted within the rock matrix. Otherwise, the treatment of the matrix is general and entirely consistent with the treatment of the fracture and single-porosity zones. A variable density is included throughout, and a variety of options are available to facilitate the various uses of the code. This document presents the theory and formulation of the SWIFT II code. It is intended to be a comprehensive statement of the mathematical, numerical, and computer implementation of the code. A companion document, Data Input Guide for SWIFT II, gives the input data guide (Reeves et al., 1986a).

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