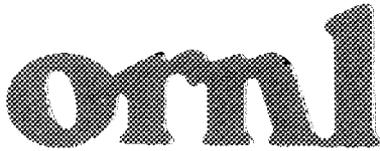




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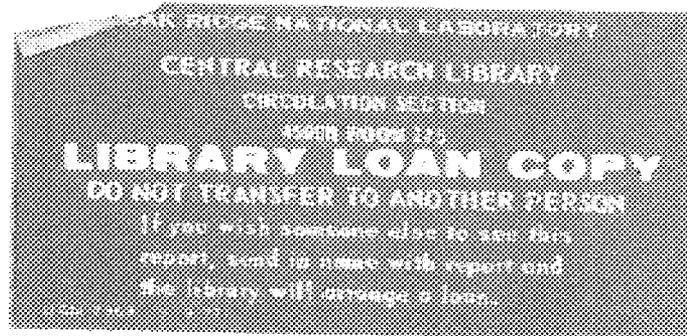
OAK RIDGE
NATIONAL
LABORATORY

MARTIN MARIETTA

**Compendium of Technical Computer
Codes Used in Support of the
DOE Office of
Civilian Radioactive Waste Management**

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Chemical Technology Division

COMPENDIUM OF TECHNICAL COMPUTER CODES USED IN
SUPPORT OF THE DOE OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

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NOTICE: This document contains information of a preliminary nature. It is subject to revision or correction and therefore does not represent a final report.

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ABSTRACT

A compilation of technical computer codes related to ongoing work under the cognizance of the U.S. Department of Energy's Office of Civilian Radioactive Waste Management (DOE/OCRWM) is presented. Much of the information was obtained from responses to a questionnaire distributed by DOE/OCRWM to all DOE offices associated with the radioactive waste management program.

The codes are arranged alphabetically by name. In addition to the code description, each sheet includes other data such as computer hardware and software requirements, document references, name of respondent, and code variants. The codes are categorized into seventeen subject areas plus a miscellaneous category. Some of the subject areas covered are atmospheric dispersion, biosphere transport, geochemistry, nuclear radiation transport, nuclide inventory, and risk assessment. Three appendixes are included which list the names of the contributors, a list of the literature reviewed, and a glossary of computer code terminology and definitions.

1. INTRODUCTION

The Department of Energy's Office of Civilian Radioactive Waste Management (DOE/OCRWM), through its many contractors, has utilized computer models and software programs to perform facility designs, environmental assessments, and licensing activities. Because of the disparate nature of the programs it supports and the dispersed locations of the participants in the overall system, DOE/OCRWM realized that a concerted effort was needed to ensure the transferability and thus avoid the duplication of supportive software in the case where the same capabilities are needed by multiple components (monitored retrieval storage, repository, transportation, etc.) of the waste management system for licensing and design. To satisfy ongoing quality assurance (QA) programs and future licensing activities, DOE/OCRWM expects contractors to reach nearly identical conclusions when using predictive computer codes for similar modeling problems. Similarly, compatibility between input and output of the various models, developed or under development, is desirable to assure that results from one area of the waste system could be used as input into the models of other areas of the program.

To respond to the need for timely and comprehensive technical computer code software and information transfer among contractors, DOE/OCRWM asked the Oak Ridge National Laboratory (ORNL) to prepare a comprehensive compendium of technical computer codes (those codes with an engineering or physical basis). The purposes of such a compendium are to provide DOE/OCRWM projects with information on the current availability of codes and to furnish them with guidance on the codes and their applications to current projects. Science Applications International Corporation (SAIC), under contract to Martin Marietta Energy Systems (Energy Systems), has had the primary responsibility for developing the compilation of codes, based on the information received from DOE/OCRWM's contractors.

In contrast to existing computer code compendia, the code information provided in this document was obtained exclusively from

participants in DOE/OCRWM projects as of July, 1987. A questionnaire (developed by Energy Systems and DOE/OCRWM via the Technical Code Coordinating Group [TCCG]) was distributed by DOE/OCRWM via their project offices to code users. The users were requested to complete the questionnaires and return them for compilation.

Over 300 questionnaires were received and entered as described. A listing of the persons and organizations contributing completed questionnaires is provided in Appendix A. The draft document, issued for comment in July, 1987, has been extensively reorganized, and many codes were reclassified or eliminated. The codes are now listed in alphabetical order by name rather than by code type.

In addition to the codes identified by the questionnaire data base, a supplementary list of codes was developed from a literature search of existing computer code compendia. The compendia reviewed are listed in Appendix B. From the historical compendia, over 1000 codes were identified for the data base. Less than 100 of the 266 codes identified by the questionnaire appear in the historical data base.

Descriptions and other relevant information provided on the questionnaires for each code are listed in Sect. 3 of this report. Each code has been identified as fitting primarily into one (or more) of 17 categories, or "Miscellaneous".

2. COMPENDIUM OF TECHNICAL COMPUTER CODES]

As the over 300 questionnaires were received, preliminary reviews of the information were conducted from both editorial and technical standpoints. In general, the information in the data base was provided by the questionnaire respondents; however, supplementary information has been incorporated into the code data as appropriate. The code descriptions were supplemented in cases where the code descriptions were very brief and supplementary descriptions were available. Guides to the use of the printed computer code information sheets of Sect. 3 are provided in Sect. 2.1.

This compendium of computer codes is based on the completed questionnaires received during the period January through June 1987. As discussed in Sect. 2.2, it is recognized that it will be necessary to add and update information as it becomes available, especially due to the large changes in DOE/OCRWM from the NWPAA of 1987. It is requested that users of this compendium provide corrections and/or new information known to them.

2.1 USE OF THIS DOCUMENT

Information sheets have been prepared for each of the 266 code records in the data base. These information sheets are provided in Sect. 3 in alphabetical order by code name. The code categories are listed and described in Table 1.

An alphabetical listing of the 266 codes and the code types listed for each is shown in Table 2. A cross listing of the codes in each code type is shown in Table 3. Tables 1 through 3 are found at the end of Sect. 2.

A comparison of the computer codes identified from questionnaires and a corresponding list of codes identified from the literature search indicates that relatively few codes (<100) are common to both lists. Thus, about one-third of the codes listed in the questionnaires were identified in the historical information and less than one-tenth of the

codes in the historical list were described in the questionnaires. This could indicate either a high obsolescence rate of code usage within the DOE/OCRWM programs or that a significant number of codes were not identified or documented.

The information sheets provided in Sect. 3 list: Code Name, Variants, Code Type, Description, Computers, Interfaces, External Files, Acquisition, Respondent(s), References, and Comments. Information found in these various categories is described below.

Code Name:	Basic code name.
Variants:	Variations of the code name as listed by the user.
Code Type:	A list of code categories in the order of primary, secondary, etc.
Description:	A description of the code provided by the user or expanded to incorporate additional information available.
Comments:	Other information or observations.
Computer:	The type(s) of computer which can be used to run the code.
Interfaces:	Separate computer codes that can be used to generate input data for the referenced code (preprocessor) or used to process the output of the referenced code (postprocessor).
External Files:	External data files used as input data to run the referenced code.
Acquisition:	The availability or restriction on availability of the code as indicated by the user.
Respondent(s):	The person submitting the questionnaire.
Reference:	Documentation for the code (if available).

2.2 REQUEST FOR NEW INFORMATION AND CORRECTIONS

As discussed above, this compendium of technical computer codes was developed based on code questionnaires received from users over the period from January to June 1987. Comparing the code questionnaires to a listing compiled from the literature indicates that code usage has been changing. Thus, it is expected that the compendium will require periodic revisions to properly reflect code usage.

In addition to specifically requested code information via the DOE program offices, users of this document are requested to supply additions, corrections or updates to this document, in writing, to:

Oak Ridge National Laboratory
Waste Systems Data and Development Program
Bldg. 4500-N, MS 6233
P.O. Box 2008
Oak Ridge, TN 37831-6233

Table 1. Glossary of technical computer code types

Code type	Definition
Air dispersion	Codes used to calculate the concentrations of materials released into the atmosphere from one or more sources and transported due to atmospheric diffusion and air movement (e.g., wind buoyancy).
Biosphere transport	Codes used to analyze the transport of nuclides in the biosphere excluding atmospheric transport (including plant, animal, and surface water pathways to man). Also, codes are included that analyze surface hydrology.
Dose-to-man	Codes used to analyze the effect (dose) on an individual (or a population of individuals) from ingested/inhaled radionuclides, externally absorbed radiation, or subatomic particles. Doses are typically evaluated in terms of "rem" units for individuals or "person-rem" units for populations. These doses are related to health effects.
Geochemistry	Codes used to analyze the chemical reactions, bonding, and associated geochemical conditions which occur between nuclides and the surrounding rock, soils, and ground-water.
Geosphere transport	Codes used to analyze the transport of nuclides from the emplaced waste form to groundwater or to the surface. Also, codes used to analyze nuclide transport through subsurface rock media via groundwater (or other fluids). Includes codes for general groundwater hydrology.
HVAC	Codes used to analyze heating, ventilating, and air conditioning systems or related parameters.
Mapping	Codes used to analyze and plot survey data and topographical information. Includes codes used for coordinate transformations.
Mechanical stress	Codes used to analyze the effects of forces on structures in terms of the resulting stress/strain distributions.

Table 1. (continued)

Code type	Definition
Nuclear radiation transport	Codes used to analyze the transport of subatomic particles or radiation through materials. Includes codes used to analyze the potential for a composite mass of radioactive and nonradioactive elements to achieve a self-sustaining nuclear reaction (criticality). Also, codes are included that are used in processing cross sections and associated numerical factors.
Nuclide inventory	Codes used to estimate the changing isotopic composition of a mass of nuclear fuel or structural component materials due to isotopic generation, depletion, and radioactive decay.
Operations/Logistics	Codes used to analyze the movement of personnel, equipment, and materials (including wastes) and their effects on operations. Includes codes to analyze the effects and interrelationships among multiple actions accomplishing a defined objective or task.
Risk assessment	Codes used to analyze the reliability or availability of systems, subsystems, or components. (Note: "Risk" is the expectation of consequence computed as the product of a failure probability and the consequences of that failure.)
Rock mechanics	Codes used to analyze the mechanical effects of geologic forces on the rock units surrounding a geologic repository and the response of these rock units to the forces.
System modeling	Codes used to analyze the overall performance of a system in terms of logical combinations of the performance of subsystems or components. These include several categories of codes used to assess the capability of a geologic repository to isolate emplaced wastes. The codes listed in the other categories in this table could be each used as a "system modeling" or "performance assessment" tool.

Table 1. (continued)

Code type	Definition
Thermal	Codes used to analyze the heat transport in materials and the resulting temperature distributions.
Total system life cycle cost	Codes used to analyze costs associated with design, construction, operation, and decommissioning of a facility. Included in this category are codes associated with economics, resource allocation, and management.
Transportation	Codes used to analyze the movement of materials (including wastes) and its effects on operations or public health and safety.
Miscellaneous	Codes which have been identified but are not judged to be a member of the categories listed above.

Table 2. Alphabetical listing of technical computer code names and code types

Code name	Code type(s)
ABAQUS	Mechanical stress Rock mechanics Thermal
ACT-ARA	Nuclide inventory
ADINA	Mechanical stress Rock mechanics Thermal
AIRDOS-EPA	Air dispersion Biosphere transport Dose-to-man
ANISN	Nuclear radiation transport
ANSYS	Rock mechanics Mechanical stress Thermal
ARAQTZ	Geosphere transport
AREST 1.0	Geosphere transport Rock mechanics System modeling
ARRAYF	Thermal
ASHRAE	HVAC
BALANCE	Geochemistry
BESD	Mechanical stress Rock mechanics
BLAST 3	HVAC
BMINES	Mechanical stress Rock mechanics
BONAMI-S	Nuclear radiation transport
BOUGUER	Rock mechanics
BREAK	Miscellaneous

Table 2. (continued)

Code name	Code type(s)
BRINEMIG 3.1	Geosphere transport Geochemistry
BRINETEMP 1.0	Geosphere transport Thermal Geochemistry
BSTAB3D	Rock mechanics
CANGAS	Miscellaneous
CAPSIZE	Nuclear radiation transport Dose-to-man
CASKCOM 0.9	Total system life cycle cost Transportation
CELERY	Thermal
CENT	Rock mechanics Geosphere transport
CFEST	Geosphere transport Thermal
CHAINT	Geosphere transport
CHESS 1.0	Thermal System modeling
CLIMSIM	Thermal
COBRA-SFS	Thermal
COG	Nuclear radiation transport
COGO	HVAC
COIL SELECTION/PC	HVAC
COLFIT	Geochemistry
COLLOID 1	Geosphere transport Geochemistry
COLSPEC	Geochemistry

Table 2. (continued)

Code name	Code type(s)
COMCYL 2.0	Geosphere transport System modeling
COMMUNITY CLIMATE MODEL	Air dispersion
COMPL728	Rock mechanics Mechanical stress
COMPLEX I	Air dispersion
COYOTE	Thermal
CPOR	Geosphere transport Rock mechanics
CREEP2	System modeling
CYLSEC	Nuclear radiation transport
D2HDPDT	Miscellaneous
DACRIN 1.00	Air dispersion Dose-to-man
DAYLITE	Thermal
DECAM 3.0	Total system life cycle cost
DISPATCH	Transportation Operations and logistics System modeling
DOT	Thermal System modeling Rock mechanics
DOT-IV	Nuclear radiation transport
DRAW	Miscellaneous
DYNA (2D/3D)	Mechanical stress
ENERGY/PC	HVAC
ENVIRONMENTAL NOISE	Miscellaneous

Table 2. (continued)

Code name	Code type(s)
EPASTAT 2.0	Geosphere transport
EQ3/EQ6	Geochemistry
ET 2.0	Geosphere transport
FACSIM	Operations and logistics System modeling
FD3INV	Geosphere transport
FE2INV	Geosphere transport
FE2SEN	Geosphere transport
FE3DGW 1.0	Geosphere transport System modeling
FE3INV	Geosphere transport
FE3SEN	Geosphere transport
PECTRA 1.0	Geosphere transport
FEHMS 1	Rock mechanics Geosphere transport
FEMTRAN	Geosphere transport
FICA 1	Operations and logistics Transportation
FLEXBLAN	Rock mechanics Mechanical stress
FLOW AND SOLUTE TRANSPORT	Geosphere transport
FRANET 2.0	Geosphere transport
GASDOSE	Air dispersion Dose-to-man
GASPAR	Air dispersion Dose-to-man

Table 2. (continued)

Code name	Code type(s)
GDEN	Rock mechanics Geosphere transport
GENERALIZED PLANE COORDINATE	Mapping
GENIE 1.0	Geosphere transport
GEODETTIC POSITION AND INVERSE	Mapping
GEOSTAT 1.0	System modeling
GEOETHER/VTH	Geosphere transport Thermal
GRAPH	Geosphere transport
GRASP 0.0	Geosphere transport
GRESS	System modeling
GRID COORDINATE CONVERSION	Mapping
GRIDEM	Mapping
GROUNDWATER MODEL (2D/3D)	Geosphere transport
GROUTMIX	Rock mechanics Mechanical stress
GS-CAM1	Mapping
HDOC	Geosphere transport
HEADCO 1.0	Geosphere transport
HEATING5/6	Thermal
HEC (1 & 2)	Biosphere transport
HEFF	Mechanical stress Thermal
HELG	Geochemistry
HEXGEN 1.0	Geosphere transport

Table 2. (continued)

Code name	Code type(s)
HIGHWAY 3.0	Transportation Operations and logistics
HMR52	Risk assessment
HPRM	Rock mechanics
HYDRA-II	Thermal
ILLUDAS	Miscellaneous
IMAGES 3-D 1.2	Mechanical stress
INCAV.BAS	Rock mechanics
INTERLINE	Transportation Operations and logistics
ISABAND	Geochemistry
ISCLT/ST	Air dispersion
ISM 6.920	Mapping
ISOQUAD	Geosphere transport
ISOSHLD	Nuclear radiation transport
JAC (2D/3D)	Rock mechanics Mechanical stress
K603	Rock mechanics
KENO	Nuclear radiation transport
KEYNUC 2.0	System modeling Geosphere transport
LASL OP2	Rock mechanics
LAYFLO 1.00	Geosphere transport System modeling
LCCS	Rock mechanics Mechanical stress

Table 2. (continued)

Code name	Code type(s)
LHS	Miscellaneous
LINEAR HORIZONTAL TRANSFORM	Mapping
LLUVIA	Geosphere transport
LOADCALC PC	HVAC
LOGSIM	Transportation Operations and logistics
LSODE	Miscellaneous
MAGNUM (2D/3D)	Geosphere transport Thermal
MAGNUM POSTPROCESSORS	Miscellaneous
MAGNUM PREPROCESSORS	Miscellaneous
MASSBAL 1.0	Nuclide inventory Geochemistry
MASSTRANS	Geosphere transport
MGRID	Geosphere transport System modeling
MICROSHIELD	Nuclear radiation transport Dose-to-man
MIDNITE	Thermal
MINC	Mapping
MODULI	Rock mechanics Mechanical stress
MORSE	Nuclear radiation transport Dose-to-man
MTFWD	Geosphere transport
NE-UCB 00.00	Geosphere transport System modeling

Table 2. (continued)

Code name	Code type(s)
NETWORK	Thermal
NIKE (2D/3D)	Mechanical stress
NITAWL-S	Nuclear radiation transport
NORIA	Geosphere transport Thermal
NPRM	Rock mechanics
ONEDANT	Nuclear radiation transport
ORIGEN-S	Nuclide inventory
ORIGEN2	Nuclide inventory
PABLM 1.00	Dose-to-man Biosphere transport
PAC LIFE 1.0	Geosphere transport Geochemistry
PACSTAT 2.00	Risk assessment
PALO DURO GSM 1.0	System modeling Geosphere transport
PANDORA	System modeling Geosphere transport
PATH (2D/3D)	Geosphere transport System modeling
PATRAN 1.6	Miscellaneous
PAVAN.1P	Air dispersion
PAYMENTS EQUAL TO TAX (PETT)	Total system life cycle cost
PCM.STAT	Geochemistry
PDGSM	Geosphere transport
PETROS 1.0 & 1.1	Geosphere transport Thermal

Table 2. (continued)

Code name	Code type(s)
PHREEQE 1.0	Geochemistry System modeling
PITS	Rock mechanics
PLUS FAMILY	Thermal
PMASPLT	Rock mechanics
POPULATION IN-MIGRATION MODEL	Operations and logistics
PORFLO (2D/3D)	Geosphere transport Thermal System modeling
FORMC-SF (2D/3D)	Geosphere transport
POROS	Rock mechanics Geosphere transport
PRICKETTE & LONNQUIST BULL. #55	Geosphere transport
PRO	Geosphere transport
PT/PTC (2D/3D)	Geosphere transport Mechanical stress Thermal
PTDIS.1P	Air dispersion
PTPLU.1P	Air dispersion
PTRACK 0.0	Geosphere transport
PTXXX SERIES MODEL 5	Air dispersion
PUMP	Geosphere transport
QAD-CG	Nuclear radiation transport Dose-to-man
RADIOL 1	Nuclide inventory
RADRISK	Dose-to-man

Table 2. (continued)

Code name	Code type(s)
RADTRAN III	Risk assessment Transportation Nuclide inventory
RAECOM	Miscellaneous
RANGEN	System modeling
RECON 2.0	Total system life cycle cost Operations and logistics
REELCAP	Miscellaneous
REPREL 2.0	Risk assessment System modeling
ROCKMASS	Rock mechanics Thermal Geosphere transport
SAGUARO	Geosphere transport Thermal
SANCHO	Rock mechanics Mechanical stress
SCALE COMPUTATIONAL SYSTEM	Nuclear radiation transport Thermal
SCOPE	Risk assessment Nuclear radiation transport Thermal Transportation
SCOPE 1	Biosphere transport Dose-to-man Geosphere transport
SCOPE 2.0	Biosphere transport Dose-to-man Geosphere transport
SEARS - SOCIOECONOMIC ANALYSIS	Operations and logistics
SILLY	Geosphere transport
SIM	Thermal

Table 2. (continued)

Code name	Code type(s)
SIMMINE 1.0	System modeling Operations and logistics
SIMREP 1.1	System modeling Operations and logistics
SINDA	Thermal System modeling
SOCON-5 1.00	Miscellaneous
SOURCE2	Nuclear radiation transport Nuclide inventory
SPAM 1.0	System modeling Geosphere transport
SPARTAN	Geosphere transport System modeling
SPECTROM 21	Mechanical stress Rock mechanics
SPECTROM 31	Mechanical stress Rock mechanics
SPECTROM 31 SPECIAL PURPOSE	Mechanical stress Rock mechanics
SPECTROM 32	Rock mechanics Mechanical stress
SPECTROM 349	Thermal Rock mechanics
SPECTROM 349 SPECIAL PURPOSE	Thermal Rock mechanics
SPECTROM 41	Thermal Rock mechanics
SPECTROM 41 SPECIAL PURPOSE	Thermal Rock mechanics
SPECTROM 55	Thermal Geosphere transport

Table 2. (continued)

Code name	Code type(s)
SPECTROM 58	Geosphere transport Geochemistry
SPEG	Rock mechanics Geosphere transport
SPLITENS	Rock mechanics Mechanical stress
STALKS	Thermal
STEALTH 1.0	Rock mechanics Mechanical stress Thermal
STRES3D	Mechanical stress Thermal Rock mechanics
SUM	Miscellaneous
SUP-CRT	Geochemistry
SURFACE 1.0	Operations and logistics
SUTRA	Geosphere transport Thermal
SWENT 1.0	Geosphere transport Thermal
SYSNET	System modeling Rock mechanics
TACO 2D	Thermal
TAURUS	Thermal
TEMP	Thermal Rock mechanics
TESDEM	Mapping
THRDJRE 1.002	Geosphere transport Risk assessment Mechanical stress

Table 2. (continued)

Code name	Code type(s)
THREE	Geosphere transport
TOPAZ (2D/3D)	Thermal
TOSPAC	System modeling Geosphere transport Rock mechanics
TOUGH	Geosphere transport Thermal
TPLOT	Geosphere transport
TRACKER/TRAVEL 1.0	Geosphere transport
TRACR 3D	Geosphere transport Rock mechanics
TRANQL 2	Geochemistry Geosphere transport
TRANSIT	Operations and logistics Transportation
TRUMP - NO TRUMP	Thermal
TRUST	Geosphere transport Mechanical stress Rock mechanics
TSAP	Thermal
TUBEDENS	Rock mechanics
TURBOSEIS 1.000	Rock mechanics
TUSC 1.0	System modeling Geosphere transport
TWIGS	Thermal
TWODANT	Nuclear radiation transport
UCBNE 10.2	Geosphere transport Geochemistry

Table 2. (continued)

Code name	Code type(s)
UCLA 3D	Geosphere transport
UDEC ICG 1.1	Rock mechanics Mechanical stress Thermal
UNIVERSAL TRANSVERSE MERCATOR	Mapping
UNSAT2-VARIABLY SATURATED FLOW	Geosphere transport
US2D	Geosphere transport
USGS MODULAR FLOW MODEL	Geosphere transport
VALLEY 5	Air dispersion
VDGWF 1.0	Geosphere transport System modeling
VIEWIT	Mapping
VISCOT	Mechanical stress Rock mechanics
VNETPC	HVAC
VFAST - VARIABLY SATURATED	Geosphere transport
WADCOM-MF6	Total system life cycle cost Operations and logistics Transportation
WADWIT	Operations and logistics
WAFEC	Geosphere transport Thermal
WAPPA (B/C)	System modeling
WASTE0	Operations and logistics Risk assessment Transportation
WASTES-II	System modeling Operations and logistics Total system life cycle cost

Table 2. (continued)

Code name	Code type(s)
WATER MOVEMENT	Geosphere transport
WITCOM 7	Total system life cycle cost
WPRM	Rock mechanics
X-Y LATITUDE-LONGITUDE & GRID	Mapping
XOQDOQ.3P	Air dispersion Dose-to-man
XRFE	Geochemistry
XSDOSE	Dose-to-man Nuclear radiation transport
XSDRNPM	Nuclear radiation transport Dose-to-man

Table 3. Listing of technical computer codes by code type

Code type	Code name(s)
Air dispersion	AIRDOS-EPA COMMUNITY CLIMATE MODEL COMPLEX I DACRIN 1.00 GASDOSE GASPAR ISCLT/ST PAVAN.1P PTDIS.1P PTPLU.1P PTXXX SERIES MODEL 5 VALLEY 5 XOQDOQ.3P
Biosphere transport	AIRDOS-EPA HEC (1 & 2) PABLM 1.00 SCOPE 1 SCOPE 2.0
Dose-to-man	AIRDOS-EPA CAPSIZE DACRIN 1.00 GASDOSE GASPAR MICROSHIELD MORSE PABLM 1.00 QAD-CG RADRISK SCOPE 1 SCOPE 2.0 XOQDOQ.3P XSDOSE XSDRNPM
Geochemistry	BALANCE BRINEMIG 3.1 BRINETEMP 1.0 COLFIT COLLOID 1 COLSPEC EQ3/EQ6 HELG ISABAND MASSBAL 1.0

Table 3. (continued)

Code type	Code name(s)	
Geochemistry (continued)	PAC LIFE 1.0	
	PCM. STAT	
	PHREEQE 1.0	
	SPECTROM 58	
	SUP-CRT	
	TRANQL 2	
	UCBNE 10.2	
	XRFE	
	Geosphere transport	ARAQTZ
		AREST 1.0
BRINEMIG 3.1		
BRINETEMP 1.0		
CENT		
CFEST		
CHAI NT		
COLLOID 1		
COMCYL 2.0		
CPOR		
EPASTAT 2.0		
ET 2.0		
FD3INV		
FE2INV		
FE2SEN		
FE3DGW 1.0		
FE3INV		
FE3SEN		
FECTRA 1.0		
FEHMS 1		
FEMTRAN		
FLOW AND SOLUTE TRANSPORT		
FRANET 2.0		
GDEN		
GENIE 1.0		
GEO THER/VTH		
GRAPH		
GRASP 0.0		
GROUNDWATER MODEL (2D/3D)		
HDOC		
HEADCO 1.0		
HEXGEN 1.0		
ISOQUAD		
KEYNUC 2.0		
LAYFLO 1.00		
LLUVIA		

Table 3. (continued)

Code type	Code name(s)
Geosphere transport (continued)	MAGNUM (2D/3D) MASSTRANS MGRID MTFWD NE-UCB 00.00 NORIA PAC LIFE 1.0 PALO DURO GSM 1.0 PANDORA PATH (2D/3D) PDGSM PETROS 1.0 & 1.1 PORFLO (2D/3D) FORMG-SF (2D/3D) POROS PRICKETTE & LONNQUIST BULL. #55 PRO PT/PTC (2D/3D) PTRACK 0.0 PUMP ROCKMASS SAGUARO SCOPE 1 SCOPE 2.0 SILLY SPAM 1.0 SPARTAN SPECTROM 55 SPECTROM 58 SPEG SUTRA SWENT 1.0 THRDJRE 1.002 THREE TOSPAC TOUGH TPLOT TRACKER/TRAVEL 1.0 TRACR 3D TRANQL 2 TRUST TUSC 1.0 UCBNE 10.2 UCLA 3D UNSAT2-VARIABLY SATURATED FLOW

Table 3. (continued)

Code type	Code name(s)
Geosphere transport (continued)	US2D USGS MODULAR FLOW MODEL VDCWF 1.0 VSFAST - VARIABLY SATURATED WAFEC WATER MOVEMENT
HVAC	ASHRAE BLAST 3 COGO COIL SELECTION/PC ENERGY/PC LOADCALC PC VNETPC
Mapping	GENERALIZED PLANE COORDINATE GEODETIC POSITION AND INVERSE GRID COORDINATE CONVERSION GRIDEM GS-CAM1 ISM 6.920 LINEAR HORIZONTAL TRANSFORM. MINC TESDEM UNIVERSAL TRANSVERSE MERCATOR VIEWIT X-Y LATITUDE-LONGITUDE & GRID
Mechanical stress	ABAQUS ADINA ANSYS BESD BMINES COMP1728 DYNA (2D/3D) FLEXBLAN GROUTMIX HEFF IMAGES 3-D 1.2 JAC (2D/3D) LCCS MODULI NIKE (2D/3D) PT/PTC (2D/3D) SANCHO

Table 3. (continued)

Code type	Code name(s)
Mechanical stress (continued)	SPECTROM 21
	SPECTROM 31
	SPECTROM 31 SPECIAL PURPOSE
	SPECTROM 32
	SPLITENS
	STEALTH 1.0
	STRES3D
	THRDJRE 1.002
	TRUST
	UDEC ICG 1.1
	VISCOT
Nuclear radiation transport	ANISN
	BONAMI-S
	CAPSIZE
	COG
	CYLSEC
	DOT-IV
	ISOSHLD
	KENO
	MICROSHIELD
	MORSE
	NITAWL-S
	ONEDANT
	QAD-CG
	SCALE COMPUTATIONAL SYSTEM
	SCOPE
	SOURCE2
TWODANT	
XSDOSE	
XSDRNPM	
Nuclide inventory	ACT-ARA
	MASSBAL 1.0
	ORIGEN-S
	ORIGEN2
	RADIOL 1
	RADTRAN III
SOURCE2	
Operations and logistics	DISPATCH
	FACSIM
	FICA 1
	HIGHWAY 3.0
	INTERLINE

Table 3. (continued)

Code type	Code name(s)
Operations and logistics (continued)	LOGSIM POPULATION IN-MIGRATION MODEL RECON 2.0 SEARS - SOCIOECONOMIC ANALYSIS SIMMINE 1.0 SIMREP 1.1 SURFACE 1.0 TRANSIT WADCOM-MF6 WADWIT WASTEO WASTES-II
Risk assessment	HMR52 PACSTAT 2.00 RADTRAN III REPREL 2.0 SCALE COMPUTATIONAL SYSTEM THRDJRE 1.002 WASTEO
Rock mechanics	ABAQUS ADINA ANSYS AREST 1.0 BESD BMINES BOUGUER BSTAB3D CENT COMP1728 CPOR DOT FEHMS 1 FLEXBLAN GDEN GROUTMIX HPRM INCAV.BAS JAC (2D/3D) K603 LASL OP2 LCCS MODULI NPRM

Table 3. (continued)

Code type	Code name(s)
Rock mechanics (continued)	PITS PMASPLT POROS ROCKMASS SANCHO SPECTROM 21 SPECTROM 31 SPECTROM 31 SPECIAL PURPOSE SPECTROM 32 SPECTROM 349 SPECTROM 349 SPECIAL PURPOSE SPECTROM 41 SPECTROM 41 SPECIAL PURPOSE SPEG SPLITENS STEALTH 1.0 STRES3D SYSNET TEMP TOSPAC TRACR 3D TRUST TUBEDENS TURBOSEIS 1.000 UDEC ICG 1.1 VISCOT WPRM
System modeling	AREST 1.0 CHEESS 1.0 COMCYL 2.0 CREEP2 DISPATCH DOT FACSIM FE3DGW 1.0 GEOSTAT 1.0 GRESS KEYNUC 2.0 LAYFLO 1.00 MGRID NE-UCB 00.00 PALO DURO GSM 1.0 PANDORA PATH (2D/3D)

Table 3. (continued)

Code type	Code name(s)
System modeling (continued)	PHREEQE 1.0 PORFLO (2D/3D) RANGEN REPREL 2.0 SIMMINE 1.0 SIMREP 1.1 SINDA SPAM 1.0 SPARTAN SYSNET TOSPAC TUSC 1.0 VDGWF 1.0 WAPPA (B/C) WASTES-II
Thermal	ABAQUS ADINA ANSYS ARRAYF BRINETEMP 1.0 CELERY CFEST CHEESS 1.0 CLIMSIM COBRA-SFS COYOTE DAYLITE DOT GEOTHER/VTH HEATING5/6 HEFF HYDRA-II MAGNUM (2D/3D) MIDNITE NETWORK NORIA PETROS 1.0 & 1.1 PLUS FAMILY PORFLO (2D/3D) PT/PTC (2D/3D) ROCKMASS SAGUARO SCALE COMPUTATIONAL SYSTEM SCOPE

Table 3. (continued)

Code type	Code name(s)
Thermal (continued)	SIM SINDA SPECTROM 349 SPECTROM 349 SPECIAL PURPOSE SPECTROM 41 SPECTROM 41 SPECIAL PURPOSE SPECTROM 55 STALKS STEALTH 1.0 STRES3D SUTRA SWENT 1.0 TACO 2D TAURUS TEMP TOPAZ (2D/3D) TOUGH TRUMP - NO TRUMP TSAP TWIGS UDEC ICG 1.1 WAFEC
Total system life cycle cost	CASKCOM 0.9 DECOM 3.0 PAYMENTS EQUAL TO TAX (PETT) RECON 2.0 WADCOM-MF6 WASTES-II WITCOM 7
Transportation	CASKCOM 0.9 DISPATCH FICA 1 HIGHWAY 3.0 INTERLINE LOGSIM RADTRAN III SCOPE TRANSIT WADCOM-MF6 WASTEO

Table 3. (continued)

Code type	Code name(s)
Miscellaneous	BREAK CANGAS D2HDPDT DRAW ENVIRONMENTAL NOISE ILLUDAS LHS LSODE MAGNUM POSTPROCESSORS MAGNUM PREPROCESSORS PATRAN 1.6 RAECOM REELCAP SOCON-5 1.00 SUM

3. DESCRIPTIONS OF TECHNICAL COMPUTER CODES

This section contains the listing of 266 computer code, alphabetically by code name, resulting from over 300 questionnaires received from the many contributors at the DOE field offices and their contractors. About 100 of the codes listed in this section were also listed in one of the many previous compilations of computer codes shown in Appendix B. This indicates that the majority of technical computer codes currently in use by the OCRWM program have only recently been developed, perhaps to analyze unique performance requirements of a civilian radioactive waste repository.

CODE NAME: ABAQUS

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS
ROCK MECHANICS
THERMAL

DESCRIPTION: ABAQUS IS A GENERAL-PURPOSE FINITE-ELEMENT CODE DESIGNED SPECIFICALLY FOR THE ANALYSIS OF NON-LINEAR STRUCTURAL MECHANICS PHENOMENA. NON-LINEAR CAPABILITIES OF SPECIAL INTEREST TO GEOMECHANICS ANALYSTS INCLUDE: CREEP AND SWELLING (EITHER POWER LAW OR MORE GENERALLY BY USER SUPPLIED SUBROUTINE); NON-LINEAR ELASTIC SOIL MODELS; SEVERAL VARIANTS OF CAM-CLAY SOIL MODELS; CONCRETE MODELS; INCLUDING CRACKING AND CRUSHING, WITH WATER PENETRATION INTO FAILED ZONES THAT CONNECT TO WET POINTS; TENSION CUT OFF; AND GAP AND INTERFACE ELEMENTS. NON-LINEAR THERMAL, CONSOLIDATION, SEEPAGE AND ASSOCIATED COUPLED ANALYSES ARE POSSIBLE, INCLUDING FULLY COUPLED HEAT TRANSFER AND STRESS ANALYSIS (WITH CLEARANCE-DEPENDENT GAP CONDUCTION AND RADIATION). FINITE STRAIN EFFECTS CAN BE INCLUDED IN UNCOUPLED AND FULLY COUPLED STRESS/CONSOLIDATION ANALYSIS (INCLUDING PERMEABILITY AS A FUNCTION OF TIME). THERE ARE EXTENSIVE CAPABILITIES FOR USERS TO SUPPLY THEIR OWN BOUNDARY CONDITION AND MATERIAL DATA BY SUBROUTINE.

COMMENTS: NONE

COMPUTER(S): CRAY, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, USAGE FEE REQUIRED

RESPONDENT(S): HIBBIT, SORENSON, KARLSON I.J. DEMPSTER
UNIVERSITY OF MINNESOTA ROCKWELL HANFORD
(509) 376-1988

REFERENCE: UNKNOWN

CODE NAME: ACT-ARA

VARIANTS: NONE

CODE TYPE: NUCLIDE INVENTORY

DESCRIPTION: PROGRAM FOR CALCULATION OF PROBABILISTIC CUMULATIVE
RELEASE TO SUPPORT 40CFR191 POSTCLOSURE RELEASE
CALCULATIONS AND ALSO SOURCE TERM AS A FUNCTION OF TIME.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): S. WOOLFOLK
SAIC
FTS 575-1875

REFERENCE: S. W. WOOLFOLK, "ACT: A PROGRAM FOR CALCULATION OF THE
CHANGES IN RADIOLOGICAL SOURCE TERMS WITH TIME," WIPP/
DOE-85-201 (ARA/TSD 5006-0006) (AUGUST 1985).

CODE NAME: ADINA

VARIANTS: ADINA/BM

CODE TYPE: MECHANICAL STRESS
ROCK MECHANICS
THERMAL

DESCRIPTION: ADINA IS A GENERAL PURPOSE FINITE ELEMENT PROGRAM FOR THE ANALYSIS OF STRUCTURAL MECHANICS PROBLEMS. IT HAS EXTENSIVE CAPABILITIES TO ANALYZE LINEAR AND NONLINEAR, STATIC AND DYNAMIC THREE DIMENSIONAL BEHAVIOR. THE ASSOCIATED PROGRAM ADINAT SOLVES HEAT TRANSFER AND ANALOGOUS FIELD PROBLEMS. NON-LINEARITIES MAY BE DUE TO LARGE DISPLACEMENTS, NON-LINEAR MATERIAL AND VARIABLE BOUNDARY CONDITIONS. OF SPECIAL RELEVANCE TO THE PRESENT STUDY ARE THE MATERIAL MODELS FOR THERMO-ELASTO-PLASTIC CREEP BEHAVIOR, CONCRETE/ROCK BEHAVIOR AND THE ELEMENT BIRTH AND DEATH OPTION.

COMMENTS: NONE

COMPUTER(S): VAX, PRIME

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): I. J. DEMPSTER F. THAMIR
ROCKWELL HANFORD USGS/WRD/NHP
(509) 376-1988 (303) 236-5187

REFERENCE: UNKNOWN

CODE NAME: AIRDOS-EPA

VARIANTS: AIRDOS-EPA 1.00

CODE TYPE: AIR DISPERSION
BIOSPHERE TRANSPORT
DOSE-TO-MAN

DESCRIPTION: A MODIFIED GAUSSIAN PLUME EQUATION IS USED TO ESTIMATE BOTH HORIZONTAL AND VERTICAL DISPERSION OF AS MANY AS 36 RADIONUCLIDES RELEASED FROM ONE TO SIX STACKS OR AREA SOURCES. RADIONUCLIDE CONCENTRATIONS IN MEAT, MILK, AND FRESH PRODUCE CONSUMED BY HUMANS ARE ESTIMATED BY COUPLING THE OUTPUT OF THE ATMOSPHERIC TRANSPORT MODELS WITH THE U.S. NRC, REGULATORY GUIDE 1.109 TERRESTRIAL FOOD CHAIN MODELS. DOSE CONVERSION FACTORS ARE INPUT TO THE CODE, AND DOSES TO MAN AT EACH DISTANCE AND DIRECTION SPECIFIED ARE ESTIMATED FOR TOTAL BODY, RED MARROW, LUNGS, ENDOSTEAL CELLS, STOMACH WALL, LLI WALL, THYROID, LIVER, KIDNEYS, TESTES, AND OVARIES THROUGH THE FOLLOWING EXPOSURE MODES: (1) IMMERSION IN AIR CONTAINING RADIONUCLIDES; (2) EXPOSURE TO GROUND SURFACES CONTAMINATED BY DEPOSITED RADIONUCLIDES; (3) IMMERSION IN CONTAMINATED WATER; (4) INHALATION OF RADIONUCLIDES IN AIR; AND (5) INGESTION OF FOOD PRODUCED IN THE AREA. THE CODE MAY BE RUN TO ESTIMATE HIGHEST ANNUAL INDIVIDUAL DOSE IN THE AREA OR ANNUAL POPULATION DOSE. GROUND CONCENTRATIONS OF RADIONUCLIDES AND INTAKE RATES BY MAN ARE TABULATED FOR EACH ENVIRONMENTAL LOCATION. EXPOSURES ARE ALSO CALCULATED AND TABULATED FOR INHALATION OF 222 RN SHORT-LIVED PROGENY.

COMMENTS: NONE

COMPUTER(S): CDC, IBM-PC, VAX

INTERFACES: PRE/POST-PROCESSOR - STAR, RADRISK /DARTAB, RADRISK

EXTERNAL FILES: NONE

ACQUISITION: NONE

RESPONDENT(S): MARK D. OTIS, EG&G IDAHO, INC. (208) 526-0603
J.J. MAYBERRY, ONWI, (614) 424-7753
S. WOOLFOLK, SAIC, FTS-575-1875

REFERENCE: R. E. MOORE ET AL., AIRDOS-EPA: A COMPUTERIZED METHODOLOGY FOR ESTIMATING ENVIRONMENTAL CONCENTRATIONS AND DOSE-TO-MAN FROM AIRBORNE RELEASES OF RADIONUCLIDES, ORNL-5532, JUNE 1979.

CODE NAME: ANSYS

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS
THERMAL

DESCRIPTION: THE ANSYS COMPUTER CODE IS A GENERALIZED STRESS ANALYSIS CODE WIDELY USED IN THE NUCLEAR INDUSTRY. THIS PROPRIETARY COMPUTER CODE, DEVELOPED BY SWANSON ANALYSIS SYSTEMS, HAS A BROAD CAPABILITY TO ANALYZE THE THERMOMECHANICAL RESPONSE OF ROCKS. SOME OF THE UNIQUE CAPABILITIES OF THIS CODE ARE: THE ABILITY OF MODEL A CONTINUOUS JOINTED ROCK MASS; CAN BE USED TO ANALYZE STRESSES AND STRAINS IN TWO OR THREE DIMENSIONS; CAN SIMULATE COUPLED HEAT AND STRESS TRANSIENTS; CAN CONSIDER LINEAR AND NON-LINEAR ROCK PROPERTIES; HAS A 3D ANISOTROPIC SOLID ELEMENT THAT ALLOWS A FULL 6 X 6 TEMPERATURE DEPENDENT ANISOTROPIC STRESS-STRAIN MATRIX; AND HAS A 3D SOLID CONCRETE ELEMENT (ALSO USED FOR ROCK) THAT HAS CRACKING AND CRUSHING CAPABILITY. THE COMPUTER CODE IS VERY WELL DOCUMENTED WITH REGARD TO INPUT INSTRUCTIONS AND USE.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, IBM, VAX, CDC, CRAY

INTERFACES: POSTPROCESSOR- PATRAN
PREPROCESSOR - PATRAN

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): WILLIAM W. CHEN
BWIP PERFORMANCE ASSESSMENT
376-5969

REFERENCE: UNKNOWN

CODE NAME: ARAQTZ

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: RECONSTRUCTION AND IMAGE DISPLAY FOR COMPUTED IMPEDANCE
TOMOGRAPHY - USES BACK PROJECTION TECHNIQUES.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): WILLIAM DAILY
LLNL
(415) 422-8623

REFERENCE: UNKNOWN

CODE NAME: AREST 1.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
ROCK MECHANICS
SYSTEM MODELING

DESCRIPTION: THE AREST CODE IS DESIGNED TO PROVIDE A QUANTITATIVE ASSESSMENT OF THE PERFORMANCE OF INDIVIDUAL BARRIER MATERIALS AND THE OVERALL ENGINEERED BARRIER SYSTEM RELATIVE TO REGULATORY REQUIREMENTS FOR CONTAINMENT AND SLOW RELEASE OF RADIONUCLIDES. IT CONTAINS MODELS FOR CORROSION AND MASS TRANSFER RELEASE, AS WELL AS OPTIONS FOR STATISTIC INPUT/OUTPUT.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: ANSYS, EQ3/EQ6, WASTES II

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): MICHAEL APTED
PNL
(509) 375-2156

REFERENCE: UNKNOWN

CODE NAME: ARRAYF

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: ANALYTIC SOLUTION FOR SUPERPOSITION OF CYLINDRICAL
DECAYING HEAT SOURCES.

COMMENTS: GOOD FOR NON REPETITIVE GEOMETRY AND FOR TRADE OFF
STUDIES.

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): R.D. KLETT
SANDIA NATIONAL LABORATORY
(505) 844-3355

REFERENCE: UNKNOWN

CODE NAME: ASHRAE

VARIANTS: NONE

CODE TYPE: HVAC

DESCRIPTION: CALCULATES ESTIMATED HVAC UNITS TO BE INSTALLED IN A GIVEN BUILDING DESIGN.

COMMENTS: IN-HOUSE GUIDE AND MATH/1000 USERS GUIDE.

COMPUTER(S): MAINFRAME

INTERFACES: PREPROCESSOR - LOADS1, LOADS2, LOADS3, MATH/1000

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): HELEN HALL
HOLMES AND NARVER
295-7763

REFERENCE: ASHRAE LOAD CALCULATION MANUAL

CODE NAME: BALANCE

VARIANTS: NONE

CODE TYPE: GEOCHEMISTRY

DESCRIPTION: MASS BALANCE CODE FOR SOLIDS, GASES, AND FLUIDS IN
GEOCHEMISTRY.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER, IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): MARK D. MITCHELL
BWIP HYDROCHEMISTRY UNIT
376-1982

REFERENCE: UNKNOWN

CODE NAME: BESD

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS
ROCK MECHANICS

DESCRIPTION: BOUNDARY ELEMENT METHOD, ISOTROPIC, ANISOTROPIC, MULTI-
LAYER CAPABILITIES; DISPLACEMENT DISCONTINUITY AND
FICTITIOUS STRESS SOLUTIONS.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER, IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): G.A. LEHMANN
BWIP ROCK MECHANICS GROUP
(509) 376-1862

REFERENCE: UNKNOWN

CODE NAME: BLAST 3

VARIANTS: NONE

CODE TYPE: HVAC

DESCRIPTION: CODE USED FOR ENERGY CONSERVATION STUDY OF THE WASTE HANDLING FACILITIES.

COMMENTS: NONE

COMPUTER(S): MAINFRAME

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ZIG STACION
BECHTEL NATIONAL INC.

REFERENCE: BLAST 3.0, NESC NO. 9990.C175C, BLAST 3.0 TAPE DESCRIPTION, NATIONAL ENERGY SOFTWARE CENTER NOTE 86-58, JUNE 4, 1986.

CODE NAME: BMINES

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS
ROCK MECHANICS

DESCRIPTION: BMINES (BUMINES) CONSIDERS STATIC, LINEAR, AND NONLINEAR MATERIAL PROPERTIES IN TWO- OR THREE-DIMENSIONAL REPRESENTATIONS WITH APPLIED EXTERNAL FORCES AND PRESSURES, DISPLACEMENTS, AND GRAVITY LOADING. IN ADDITION, SEQUENCE OF CONSTRUCTION (I.E., ADDITION OR REMOVAL OF ELEMENTS) CAN BE CONSIDERED. MODELING OF SLIP SURFACES (FAULTS) IS POSSIBLE. BOTH STRUCTURAL AND CONTINUUM ELEMENTS ARE AVAILABLE. THE CODE HAS SOPHISTICATED MESH GENERATION CAPABILITY FOR EASE OF MESH DESCRIPTION, IS QUITE EFFICIENT, IS RESTARTABLE FROM TAPE, AND IS USER-ORIENTED. A FINITE-ELEMENT METHOD IS USED. INPUTS ARE BASIC STRUCTURAL CONFIGURATIONS, LOADS, MATERIAL DEFINITIONS, AND A SEQUENCE OF ELEMENT REMOVAL AND INSERTION. OUTPUT INCLUDES DISPLACEMENT, STRESSES, AND STRAINS. MESH PLOTS ARE ALSO AVAILABLE.

COMMENTS: NONE

COMPUTER(S): IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): BRIAN EHGARTNER
SNL
846-5487

REFERENCE: UNKNOWN

CODE NAME: BONAMI-S

VARIANTS: NONE

CODE TYPE: NUCLEAR RADIATION TRANSPORT

DESCRIPTION: RESONANCE SHIELDING VIA APPLICATION OF BONDARENKO
SHIELDING FACTOR METHOD.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, IBM, GRAY

INTERFACES: POSTPROCESSOR- NITAWL

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): L.M. PETRIE
ORNL
(615) 574-5259

REFERENCE: N. M. GREENE, "BONAMI-S: RESONANCE SELF-SHIELDING BY
THE BONDARENKO METHOD", NUREG/CR-0200, VOLUME 2, SECTION
F1, ORNL/NUREG/CSD-2/V2, 1981.

CODE NAME: BOUGUER
VARIANTS: NONE
CODE TYPE: ROCK MECHANICS
DESCRIPTION: COMPUTES TERRAIN CORRECTIONS AND GRAVITY ANOMALIES.
COMMENTS: NONE
COMPUTER(S): VAX
INTERFACES: NONE
EXTERNAL FILES: DIGITAL TERRAIN
ACQUISITION: YES, NONPROPRIETARY
RESPONDENT(S): USGS/BRANCH OF GEOPHYSICS
(415) 323-8111
REFERENCE: UNKNOWN

CODE NAME: BREAK

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: CALCULATES THE BREAK STRENGTH OF A BRAIDED SHIELD ON A CABLE.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): BERNE GEBS
HOLMES AND NARVER
295-6507

REFERENCE: UNKNOWN

CODE NAME: BRINEMIG 3.1

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
GEOCHEMISTRY

DESCRIPTION: CALCULATES BRINE FLOW RATES AND QUANTITIES OF
ACCUMULATED BRINE DUE TO THERMAL-GRADIENT-INDUCED BRINE
MIGRATION (PER THE JENKS EQUATION).

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): V. MCCAULEY
ORNL
(615) 574-9669

REFERENCE: V. S. MCCAULEY AND G. E. RAINES, "EXPECTED BRINE
MOVEMENT AT POTENTIAL NUCLEAR WASTE REPOSITORY SALT
SITES", BMI/ONWI-654, AUGUST, 1987.

CODE NAME: BRINETEMP 1.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
THERMAL
GEOCHEMISTRY

DESCRIPTION: ESTIMATES TEMPERATURES AND BRINE MIGRATION IN A SALT
REPOSITORY.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: PREPROCESSOR - WAPPA-C

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): S.G. BLOOM
ORNL
(615) 574-6638

REFERENCE: UNKNOWN

CODE NAME: BSTAB3D

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS

DESCRIPTION: EVALUATES STABILITY OF BLOCK FORMED BY FRACTURE. IN PERIMETER OF PACKAGE EMPLACEMENT HOLE.

COMMENTS: NONE

COMPUTER(S): IBM-PC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): JESSE L. YOW, JR.
LLNL
(415) 422-3521

REFERENCE: UNKNOWN

CODE NAME: CANGAS

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: CANGAS HAS BEEN DEVELOPED FOR QUANTITATIVE NEUTRON ACTIVATION ANALYSIS-GAMMA RAY SPECTROMETRY APPLICATIONS. IT IS DESIGNED FOR USE WHEN COMPARATIVE NEUTRON ACTIVATION ANALYSIS IS PERFORMED, IS BASED ON THE PRINCIPLE OF MANUAL SELECTION OF A PHOTO PEAK AREA AND COMPUTER BACKGROUND CHANNEL OF THE IDENTIFIED PHOTO PEAK IN A GAMMA-RAY SPECTRUM.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ELWOOD LEPEL
PNL

REFERENCE: UNKNOWN

CODE NAME: CAPSIZE

VARIANTS: NONE

CODE TYPE: NUCLEAR RADIATION TRANSPORT
DOSE-TO-MAN

DESCRIPTION: ESTIMATES THE REQUIRED SHIELD THICKNESS, OVERALL SIZE,
AND SUBSEQUENT CAPACITY OF PB, PE, AND U-METAL CASKS
OPTIMIZED SUBJECT TO CERTIFY CONSTRAINTS, INCLUDING THE
EXTERNAL DOSE RATE, THE OVERALL WEIGHT, THE THICKNESS OF
THE INTERNAL BASKET, AND THE BURNUP AND COOLING TIME OF
THE SPENT FUEL TO BE PLACED INSIDE THE CASK.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER, IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): J. A. BUCHOLZ
ORNL
(615) 574-5253

REFERENCE: J. A. BUCHOLZ, "CAPSIZE: A PERSONAL COMPUTER PROGRAM
AND CROSS-SECTION LIBRARY FOR DETERMINING THE SHIELDING
REQUIREMENTS, SIZE, AND CAPACITY OF SHIPPING CASKS
SUBJECT TO VARIOUS PROPOSED OBJECTIVES," ORNL/CSD/TM-248
(MAY 1987).

CODE NAME: CASKCOM 0.9

VARIANTS: CASKCOM, V. 0.1 - 0.8

CODE TYPE: TOTAL SYSTEM LIFE CYCLE COST
TRANSPORTATION

DESCRIPTION: CALCULATES THE TOTAL LIFE CYCLE COST ASSOCIATED WITH
VARIOUS CASK DESIGNS.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): D.G. DIPPOLD
BATTELLE
(614) 424-7289

REFERENCE: UNKNOWN

CODE NAME: CELERY

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: EVALUATES ANALYTICAL SOLUTIONS OF THE DIFFUSION EQUATION FOR POINT, FINITE LINE, INFINITE LINE OR INFINITE PLANE SOURCES IN AN INFINITE HOMOGENEOUS ISOTROPIC MEDIUM WITH ARBITRARY SOURCE POWER HISTORY.

COMMENTS: THE "PLUS FAMILY"

COMPUTER(S): MAINFRAME, CDC, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): D.N. MONTAN
LLNL
(415) 422-3941

REFERENCE: UNKNOWN

CODE NAME: CENT

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
GEOSPHERE TRANSPORT

DESCRIPTION: CALCULATES CAPILLARY PRESSURE CURVE FROM CENTRIFUGE DATA
(ROCK CURVE).

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER, IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER
295-7848

REFERENCE: UNKNOWN

CODE NAME: CFEST

VARIANTS: FE3DGW, CFEST 1.0, CFEST 1.1

CODE TYPE: GEOSPHERE TRANSPORT
THERMAL

DESCRIPTION: CFEST (COUPLED FLUID ENERGY AND SOLUTE TRANSPORT) PROVIDES A FINITE ELEMENT ANALYSIS OF NON-ISOTHERMAL EVENTS IN A CONFINED AQUIFER SYSTEM. SINGLE-PHASE, DARCIAN FLOWS ARE CONSIDERED IN THIS MULTI-DIMENSIONAL ANALYSIS PACKAGE. IN A CARTESIAN CO-ORDINATE SYSTEM THE CODE CAN SIMULATE FLOW AND TRANSPORT IN A HORIZONTAL PLANE, A VERTICAL PLANE, OR IN A FULLY THREE-DIMENSIONAL REGION. AN OPTION ALSO EXISTS FOR THE AXISYMMETRIC ANALYSIS OF A VERTICAL CROSS SECTION. THE PACKAGE INCLUDES SUPPORTIVE PROGRAMS FOR INTERACTIVE INPUT PREPARATION, GRAPHICAL DISPLAY OF INPUT PARAMETERS, AND PLOTTING THE RESULTS. THE CODE IS AN EXTENSION OF FE3DGW TO SIMULATE COUPLED FLOW AND ENERGY, AND SOLUTE TRANSPORT.

COMMENTS: NONE

COMPUTER(S): IBM, VAX, CDC, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): SUMANT GUPTA WILLIAM CONKERE
ONWI PNL
(614) 424-5074 FTS 444-9838

REFERENCE: UNKNOWN

CODE NAME: CHAINT

VARIANTS: CHAINT 2.3, CHAINT-MC 3.1, CHAINT-MCI-1.00

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: THE CHAINT CODE SIMULATES MULTICOMPONENT RADIONUCLIDE TRANSPORT IN A FRACTURED-POROUS MEDIUM. THE PROCESSES MODELLED INCLUDE ADVECTION, DISPERSION/DIFFUSION, SORPTION, CHAIN-DECAY COUPLING, AND MASS RELEASE. THE COMPUTATIONAL METHOD IS BASED ON A FINITE-ELEMENT SOLUTION OF THE SYSTEM OF EQUATIONS. CONTINUUM PORTIONS OF THE MEDIUM ARE MODELLED AS A SINGLE-POROSITY SYSTEM USING TWO DIMENSIONAL ISOPARAMETRIC ELEMENTS. DISCRETE FRACTURES ARE MODELLED USING ISOPARAMETRIC LINE ELEMENTS THAT ARE EMBEDDED ALONG THE SIDES OF THE TWO-DIMENSIONAL ELEMENTS. PRINCIPAL INPUT TO THE CODE IS THE GROUND-WATER FLOW CALCULATION OBTAINED WITH THE MAGNUM2D CODE (OR A COMPARABLE NON-ISOTHERMAL FLOW MODEL). THE CHAINT CODE IS GENERALIZED TO HANDLE ANY COMBINATION OF NUCLIDES (ACTINIDES, FISSION, OR ACTIVATION PRODUCTS) WITH DIFFERENT HALF-LIVES; ACCOMMODATES SUBZONE CALCULATIONS IN WHICH THE REGION OF ACTIVE NODES, WITHIN THE FINITE ELEMENT MESH, IS VARIED WITH TIME AS THE PROBLEM PROGRESSES; AND IS SECOND ORDER ACCURATE AND FULLY IMPLICIT.

COMMENTS: NONE

COMPUTER(S): CRAY

INTERFACES: PREPROCESSOR - MAGNUM-2D

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): DAVE LANGFORD
BWIP
(509) 376-6175

REFERENCE: UNKNOWN

CODE NAME: CHEESS 1.0

VARIANTS: NONE

CODE TYPE: THERMAL
SYSTEM MODELING

DESCRIPTION: A THREE-DIMENSIONAL SEMI-ANALYTICAL HEAT CONDUCTION CODE
FOR DETERMINING TEMPERATURES AT A GEOLOGIC REPOSITORY
FOR NUCLEAR WASTE.

COMMENTS: NONE

COMPUTER(S): MINI, PERSONAL COMPUTER, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.C. YEUUG
SAIC
(415) 351-7807

REFERENCE: UNKNOWN

CODE NAME: CLIMSIM

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: THE PURPOSE OF "CLIMSIM" IS TO PROVIDE A RAPID MEANS OF PREDICTING THE VARIATION IN PSYCHROMETRIC, THERMODYNAMIC AND HEAT STRESS INDICES AT CHOSEN INTERVALS ALONG ANY UNDERGROUND SHAFT, SLOPE OR AIRWAY GIVEN THE INLET CONDITIONS AND INFORMATION RELATING TO THOSE PARAMETERS THAT GOVERN UNDERGROUND CLIMATE.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER

INTERFACES: POSTPROCESSOR- VNETPC

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): KEITH WALLACE
MINE VENTILATION SERVICES
(415) 284-5912

REFERENCE: UNKNOWN

CODE NAME: COBRA-SFS

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: COBRA-SFS IS USED FOR THERMAL-HYDRAULIC ANALYSIS OF SPENT FUEL STORAGE SYSTEMS AS WELL AS OTHER THERMAL AND FLOW PROBLEMS. FEATURES INCLUDE MODELING OF NATURAL CIRCULATION AND DETAILED RADIATION HEAT TRANSFER. EQUATIONS ARE IMPLICIT IN TIME.

COMMENTS: NONE

COMPUTER(S): CDC, CRAY

INTERFACES: PREPROCESSOR - RADX-1

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DAVID R. RECTOR
PNL
(509) 375-2300

REFERENCE: N. J. LOMBARDO, J. M. CUTA, T. E. MICHENER, D. R. RECTOR, AND C. L. WHEELER, "COBRA-SFS: A THERMAL HYDRAULIC ANALYSIS COMPUTER CODE, VOLUME III: VALIDATION ASSESSMENTS, : PNL-6049 VOL. III (DECEMBER 1986).

CODE NAME: COG

VARIANTS: MORSE-L

CODE TYPE: NUCLEAR RADIATION TRANSPORT

DESCRIPTION: SOLVES NEUTRON, GAMMA RAY, AND COUPLED NEUTRON-GAMMA
TRANSPORT AND SHIELDING PROBLEMS; USES MONTE CARLO
METHOD AND POINT CROSS SECTIONS.

COMMENTS: AVAILABLE AT LLNL; MAY BE AVAILABLE TO OTHER DOE
INSTITUTIONS BY ARRANGEMENT.

COMPUTER(S): CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): THOMAS P. WILCOX, JR.
LLNL
(415) 422-6917

REFERENCE: UNKNOWN

CODE NAME: COGO

VARIANTS: NONE

CODE TYPE: HVAC

DESCRIPTION: PROCESSES COORDINATE GEOMETRICS FOR SURVEY OR HORIZONTAL CONTROL OF A PROJECT (ROADS AND HIGHWAY DESIGN).

COMMENTS: NONE

COMPUTER(S): MAINFRAME, IBM-PC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): JOHN HAWKINS DON SCOTT
HOLMES AND NARVER HOLMES AND NARVER
295-7739 295-3487

REFERENCE: UNKNOWN

CODE NAME: COIL SELECTION/PC
VARIANTS: NONE
CODE TYPE: HVAC
DESCRIPTION: CALCULATES PSYCHROMETRIC PROPERTIES OF AIR IN A
CONDITIONED SPACE TO PERFORM AC ANALYSIS.
COMMENTS: NONE
COMPUTER(S): MINI
INTERFACES: NONE
EXTERNAL FILES: NONE
ACQUISITION: NO, PROPRIETARY
RESPONDENT(S): ROY WHITE
HOLMES AND NARVER
295-7731
REFERENCE: UNKNOWN

CODE NAME: COLFIT

VARIANTS: NONE

CODE TYPE: GEOCHEMISTRY

DESCRIPTION: FITS OPTICAL EXTINCTION BAND SHAPE DATA PRODUCED BY
SODIUM COLLOIDAL PARTICLES USING THE MARQUARDT
ALGORITHM.

COMMENTS: PROPRIETARY CDC COMPILER

COMPUTER(S): IBM, VAX, CDC

INTERFACES: PREPROCESSOR - COLSPEC, ISABAND

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): P.W. LEVY
BROOKHAVEN NATIONAL LAB.
FTS-666-3820

REFERENCE: UNKNOWN

CODE NAME: COLLOID 1

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
GEOCHEMISTRY

DESCRIPTION: COLLOID MODELS THE TRANSPORT OF RADIOCOLLOIDS USING THE POPULATION BALANCE METHODOLOGY. THE POPULATION BALANCE IS A NUMBER CONTINUITY EQUATION. THE IMPORTANT POPULATION BALANCE SUBMODELS FOR NUCLEAR WASTE DISPOSAL ARE NUCLEATION, CAPTURE, AND AGGLOMERATION.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, IBM-PC
CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): H. E. NUTTALL
UNIVERSITY OF NEW MEXICO
(505) 277-6112

REFERENCE: UNKNOWN

CODE NAME: COLSPEC

VARIANTS: NONE

CODE TYPE: GEOCHEMISTRY

DESCRIPTION: USES MIE THEORY TO CALCULATE SHAPE OF SODIUM COLLOID
EXTINCTION BAND AS A FUNCTION OF DIELECTRIC FUNCTION,
COLLOID PARTICLE SIZE AND CONCENTRATION.

COMMENTS: NONE

COMPUTER(S): IBM, VAX, CDC

INTERFACES: PREPROCESSOR - COLFIT, ISABAND

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): P.W. LEVY
BROOKHAVEN NATIONAL LAB.
FTS 666-3820

REFERENCE: UNKNOWN

CODE NAME: COMCYL 2.0

VARIANTS: COMCYL, VER. 1.0

CODE TYPE: GEOSPHERE TRANSPORT
SYSTEM MODELING

DESCRIPTION: THE CODE QUICKLY CALCULATES THE FRACTION RATE OF MASS
RELEASE ACROSS A CYLINDRICAL FLUX SURFACE SURROUNDING A
CYLINDRICAL WASTE CONTAINER. IT IMPLEMENTS AN ANALYTIC
SOLUTION FOR RADIAL DIFFUSION ORIGINALLY PROPOSED BY
J.C. JAEGER IN 1939.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): R.J. VAN VLEET, PH.D.
BASALT WASTE ISOLATION PROJECT
(509) 376-4997

REFERENCE: UNKNOWN

CODE NAME: COMMUNITY CLIMATE MODEL

VARIANTS: NONE

CODE TYPE: AIR DISPERSION

DESCRIPTION: COMPUTES ATMOSPHERIC CIRCULATION PATTERNS, TEMPERATURE, PRECIPITATION, PRESSURE AND OTHER VARIABLES ON A COARSE GRID USING A SPECTRAL REPRESENTATION.

COMMENTS: NONE

COMPUTER(S): CRAY

INTERFACES: NONE

EXTERNAL FILES: SEE COMMENTS

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): NATIONAL CENTER - ATMOSPHERIC RESEARCH
(303) 497-1335

REFERENCE: UNKNOWN

CODE NAME: COMP1728

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS

DESCRIPTION: COMPRESSIVE STRENGTH FOR GROUT AND CONCRETE.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER, IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER, MTL
295-7848

REFERENCE: UNKNOWN

CODE NAME: COMPLEX I

VARIANTS: NONE

CODE TYPE: AIR DISPERSION

DESCRIPTION: COMPLEX I IS A STEADY-STATE GAUSSIAN DISPERSION MODEL THAT CALCULATES POLLUTANT CONCENTRATIONS IN COMPLEX TERRAIN SETTINGS. THE MODEL CALCULATES IMPACTS FROM POINT SOURCES ONLY.

COMMENTS: USER MUST SUPPLY METEOROLOGICAL, SOURCE, AND TERRAIN DATA.

COMPUTER(S): MAINFRAME

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): MARTIN JABLONSKI
SAIC
(702) 295-5813

REFERENCE: UNKNOWN

CODE NAME: COYOTE

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: FINITE-ELEMENT PROGRAM FOR THE SOLUTION OF TWO-DIMENSIONAL NONLINEAR HEAT CONDUCTION PROBLEMS. THE CODE IS USER- ORIENTED WITH AN ISOPARAMETRIC MESH GENERATION SCHEME THAT ALLOWS COMPLEX BOUNDARY SHAPES TO BE MODELED EASILY AND ACCURATELY. DISCRETE BOUNDARY CONDITIONS CAN BE TREATED. TIME INTEGRATION IS PERFORMED WITH THE CRANK-NICHOLSON TECHNIQUE. PREDICTS THERMAL ENVIRONMENTS IN A WASTE REPOSITORY.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): D.K. GARTLING JOHN F. HOLLAND
SANDIA NATIONAL LAB. SANDIA NATIONAL LAB.
FTS 844-9150 (505)846-8369

REFERENCE: UNKNOWN

CODE NAME: CPOR

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
ROCK MECHANICS

DESCRIPTION: CALCULATES APPARENT PERCENT POROSITY, PERCENT WATER
SATURATION AND PERCENT GAS-FILLED POROSITY.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, PERSONAL COMPUTER, IBM COMPATIBLE

INTERFACES: PREPROCESSOR - GDEN, SPEG

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER
295-7648

REFERENCE: UNKNOWN

CODE NAME: CREEP2

VARIANTS: NONE

CODE TYPE: SYSTEM MODELING

DESCRIPTION: TAKES FIELD INPUTS AND CONVERTS HORIZONTAL AND VERTICAL GEOMETRICS ON A POINT TO POINT BASIS.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DON SCOTT
HOLMES AND NARVER
295-3487

REFERENCE: UNKNOWN

CODE NAME: CYLSEC

VARIANTS: REV. 5, OCTOBER 1986.

CODE TYPE: NUCLEAR RADIATION TRANSPORT

DESCRIPTION: CYLSEC IS AN INTERACTIVE PROGRAM DESIGNED TO SOLVE GAMMA RAY TRANSPORT PROBLEMS USING THE POINT KERNEL METHOD.

COMMENTS: NONE

COMPUTER(S): UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): D.T. DEXHEIMER
BECHTEL WESTERN POWER CORP.
(415) 768-1234

REFERENCE: UNKNOWN

CODE NAME: D2HDPDT

VARIANTS: 2HDPOT

CODE TYPE: MISCELLANEOUS

DESCRIPTION: GEOPHYSICAL MODELLING CODE USED TO INTERPRET GRAVITY AND
MAGNETIC DATA. USE INVOLVES NUMERICAL SIMULATION.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DON SAUL
BWIP C&E, SITE DEPT.
376-8634

REFERENCE: UNKNOWN

CODE NAME: DACRIN 1.00

VARIANTS: NONE

CODE TYPE: AIR DISPERSION
DOSE-TO-MAN

DESCRIPTION: THE COMPUTER PROGRAM, DACRIN, PERMITS RAPID AND CONSISTENT ESTIMATES OF THE DISPERSION OF AIRBORNE RADIOACTIVE MATERIAL AND THE EFFECTIVE RADIATION DOSE TO THE HUMAN RESPIRATORY TRACT AND OTHER ORGANS RESULTING FROM THE INHALATION OF RADIOACTIVE AEROSOLS. THE PROGRAM IS AN OUTGROWTH OF THE DEVELOPMENT OF A MATHEMATICAL MODEL FOR THE ORGAN DOSE FOLLOWING THE BASIC PRECEPTS OF THE ICRP TASK EXPONENTIAL MODEL FOR RETENTION BY AN ORGAN OF INTEREST. MATHEMATICAL MODELS DESCRIBING ATMOSPHERIC DISPERSION HAVE BEEN INCLUDED FOR THE PURPOSE OF EVALUATING DOSES RESULTING FROM EITHER ACCIDENTAL OR CHRONIC ATMOSPHERIC RELEASES OF RADIONUCLIDES. THE PROGRAM WILL CALCULATE THE EFFECTIVE RADIATION DOSE TO ANY OF 18 ORGANS AND TISSUES FROM INHALATION OF ANY ONE OR A COMBINATION OF RADIONUCLIDES CONSIDERED BY THE ICRP. A MAXIMUM OF 10 ORGANS MAY BE SELECTED FOR EACH CASE. ORGAN DOSES FROM INHALATION CAN BE CALCULATED BY SPECIFYING EITHER THE QUANTITY OF A RADIONUCLIDE INHALED OR THE QUANTITY RELEASED TO THE ATMOSPHERE. AS MANY AS 10 DISTANCES MAY BE SPECIFIED FOR EACH USE. OUTPUT OF THE CODE CONSISTS OF THE EFFECTIVE RADIATION DOSE TO THE SELECTED ORGANS, AT SELECTED TIME INTERVALS, FOR EACH RADIONUCLIDE INHALED AS INDICATED BY THE INPUT.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): J. J. MAYBERRY S. WOOLFOLK
ONWI SAIG
(614) 424-7753 FTS 575-1875

REFERENCE: J. R. HOUSTON, D. L. STENGE, AND E. C. WATSON, "DACRIN - A COMPUTER PROGRAM FOR CALCULATING ORGAN DOSE FROM CHRONIC RADIONUCLIDE INHALATION," BNWL-B-389 (REISSUED APRIL 1976).

CODE NAME: DAYLITE

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: EVALUATES ANALYTICAL SOLUTIONS OF THE DIFFUSION EQUATION FOR POINT, FINITE LINE, INFINITE LINE OR INFINITE PLANE SOURCES IN AN INFINITE HOMOGENEOUS ISOTROPIC MEDIUM WITH ARBITRARY SOURCE POWER HISTORY.

COMMENTS: THE "PLUS FAMILY".

COMPUTER(S): MAINFRAME, CDC, GRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): D.N. MONTAN
LLNL
(415) 422-3941

REFERENCE: UNKNOWN

CODE NAME: DECAM 3.0

VARIANTS: VERSIONS 1.0 AND 2.0

CODE TYPE: TOTAL SYSTEM LIFE CYCLE COST

DESCRIPTION: MODEL TO DETERMINE D & E COSTS FOR TSLCC AND TO EVALUATE THE IMPACTS OF DELAYS ON THOSE COSTS.

COMMENTS: DECAM CAN ONLY BE RUN ON A UNISYS 1100 WITH FORTRAN, COBOL, AND DMS-1100 DATABASE MANAGEMENT SYSTEM.

COMPUTER(S): MAINFRAME

INTERFACES: POSTPROCESSOR- WITCOM

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): RON MACDONALD
ROY F. WESTON, INC.
(215) 692-3030

REFERENCE: UNKNOWN

CODE NAME: DISPATCH

VARIANTS: NONE

CODE TYPE: TRANSPORTATION
OPERATIONS AND LOGISTICS
SYSTEM MODELING

DESCRIPTION: TRACES THE DISPATCHING AND MOVEMENT OF INDIVIDUAL
TRANSPORTATION CASKS THROUGHOUT THE WASTE MANAGEMENT
SYSTEM.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: PREPROCESSOR - WASTES

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): MICHAEL R. SHAY
PNL
(509) 376-4654

REFERENCE: UNKNOWN

CODE NAME: DOT

VARIANTS: NONE

CODE TYPE: THERMAL
SYSTEM MODELING
ROCK MECHANICS

DESCRIPTION: DOT IS A GENERAL PURPOSE FINITE ELEMENT HEAT CONDUCTION CODE DESIGNED FOR BOTH LINEAR AND NONLINEAR STEADY-STATE AND TRANSIENT ANALYSIS. THE PROGRAM SOLVES THE GENERAL PARTIAL DIFFERENTIAL EQUATION WHICH GOVERNS TRANSIENT HEAT TRANSPORT IN A TWO-DIMENSIONAL ANISOTROPIC AND HETEROGENEOUS MATERIAL. CAPABILITIES ARE PROVIDED FOR MODELLING MATERIALS WITH TEMPERATURE-DEPENDENT THERMAL PROPERTIES AND TIME-DEPENDENT TEMPERATURE, HEAT FLUX, CONVECTION AND RADIATION BOUNDARY CONDITIONS, TOGETHER WITH TIME-DEPENDENT INTERNAL HEAT GENERATION. BOTH PLANAR AND AXISYMMETRIC GEOMETRIES ARE AVAILABLE. STRENGTHS OF THE CODE INCLUDE ITS FLEXIBILITY, WIDE RANGE OF POSSIBLE BOUNDARY CONDITIONS, NONLINEAR MATERIAL PROPERTIES, AND ITS EFFICIENT EQUATION SOLUTION ALGORITHM. LIMITATIONS INCLUDE THE LACK OF A THREE-DIMENSIONAL ANALYSIS CAPABILITY, NO RADIATIVE OR CONVECTIVE INTERNAL HEAT TRANSFER, AND THE NEED TO MAINTAIN A CONSTANT TIME STEP IN EACH PROGRAM EXECUTION.

COMMENTS: NONE

COMPUTER(S): IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): RENU GUPTA
ONWI
(614) 424-7717

REFERENCE: INTERA ENVIRONMENTAL CONSULTANTS, "DOT: A NONLINEAR HEAT-TRANSFER CODE FOR ANALYSIS OF TWO-DIMENSIONAL PLANAR AND AXISYMMETRIC REPRESENTATIONS OF STRUCTURES", ONWI-420, APRIL, 1983.

CODE NAME: DOT-IV

VARIANTS: NONE

CODE TYPE: NUCLEAR RADIATION TRANSPORT

DESCRIPTION: DOT-IV SOLVES THE BOLTZMANN TRANSPORT EQUATION IN TWO-DIMENSIONAL GEOMETRIES. PRINCIPAL APPLICATIONS ARE TO NEUTRON AND/OR PHOTON TRANSPORT, ALTHOUGH THE CODE CAN BE APPLIED TO TRANSPORT PROBLEMS FOR ANY PARTICLES NOT SUBJECT TO EXTERNAL FORCE FIELDS. BOTH HOMOGENEOUS AND EXTERNAL- SOURCE PROBLEMS CAN BE SOLVED. SEARCHES ON MULTIPLICATION FACTOR, TIME ABSORPTION, NUCLIDE CONCENTRATION, AND ZONE THICKNESS ARE AVAILABLE FOR REACTOR PROBLEMS. NUMEROUS EDITS AND OUTPUT DATA SETS FOR SUBSEQUENT USE ARE AVAILABLE. DOT-IV USES THE METHOD OF DISCRETE ORDINATES. BALANCE EQUATIONS ARE SOLVED FOR THE DENSITY OF PARTICLES MOVING ALONG DISCRETE DIRECTIONS IN EACH CELL OF A TWO- DIMENSIONAL SPATIAL MESH. ANISOTROPIC SCATTERING IS TREATED USING A LEGENDRE EXPANSION OF ARBITRARY ORDER. CONVERGENCE CAN BE ACCELERATED BY SEVERAL OPTIONAL SCHEMES, INCLUDING A POINTWISE RESCALING TECHNIQUE.

COMMENTS: NONE

COMPUTER(S): VAX, UNIVAC

INTERFACES: NONE

EXTERNAL FILES: DLC-85 LIBRARY

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): URBAN JENQUIN
BATTELLE NORTHWEST
509-376-4119

REFERENCE: W. A. RHOADES AND R. L. CHILDS, "AN UPDATED VERSION OF THE DOT 4 ONE- AND TWO-DIMENSIONAL NEUTRON/PHOTON TRANSPORT CODE", ORNL-5851, OAK RIDGE NATIONAL LABORATORY, 1982.

CODE NAME: DRAW

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: A SET OF PLOTTING PROGRAMS INCLUDING CONTOUR PLOT, 3-D
PLOT AND 2-D PLOT PROGRAMS.

COMMENTS: NONE

COMPUTER(S): UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ALLEN LU
BWIP
(509) 376-1113

REFERENCE: UNKNOWN

CODE NAME: DYNA (2D/3D)

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS

DESCRIPTION: NONLINEAR DYNAMIC ANALYSIS OF STRUCTURES.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: POSTPROCESSOR- ORION (2D), TAURUS (3D)
PREPROCESSOR - SLIC

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DIANE CHINN JOHN HALLQUIST
 LLNL LLNL
 (415) 422-6844 (415) 422-8756

REFERENCE: JOHN O. HALLQUIST, USER'S MANUAL FOR DYNA2D - AN
EXPLICIT TWO-DIMENSIONAL HYDRODYNAMIC FINITE ELEMENT
CODE WITH INTERACTIVE REZONING, UCID-18756 REV. 2,
JANUARY 1984.

 JOHN O. HALLQUIST, THEORETICAL MANUAL FOR DYNA3D, UCID-
 19401, MARCH 1983.

CODE NAME: ENERGY/PC
VARIANTS: NONE
CODE TYPE: HVAC
DESCRIPTION: ENERGY ANALYSIS PROGRAM FOR A GIVEN BUILDING DESIGN.
COMMENTS: NONE
COMPUTER(S): MINI, OTHER - HEATING
INTERFACES: NONE
EXTERNAL FILES: NONE
ACQUISITION: NO, PROPRIETARY
RESPONDENT(S): ROY WHITE
HOLMES AND NARVER
295-7731
REFERENCE: 1985 ASHRAE HANDBOOK OF FUNDAMENTALS

CODE NAME: ENVIRONMENTAL NOISE

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: 3-D COMPUTER SIMULATED MODEL DESIGNED TO PREDICT NOISE FROM STATIONARY OR MOBILE SOURCES. THE PROGRAM USES OCTAVE BAND OR 1/3 OCTAVE BAND DATA TO PREDICT COMMUNITY NOISE.

COMMENTS: 10. USER GENERATED INPUT FILE.

COMPUTER(S): MAINFRAME, UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): RAY NUGENT
BECHTEL NATIONAL, INC.
(713) 235-2751

REFERENCE: UNKNOWN

CODE NAME: EPASTAT 2.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: SOLVES 1-D MASS TRANSPORT EQUATION WITH DIFFUSION,
ADVECTION, RETARDATION AND DECAY. COMPUTES
CONCENTRATIONS AND CUMULATIVE FLUX ACROSS A BOUNDARY.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: PREPROCESSOR - CHAINT.MC, REPREL

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): PAUL W. ESLINGER
BASALT WASTE ISOLATION PROJECT
(509) 376-3442

REFERENCE: UNKNOWN

CODE NAME: EQ3/EQ6

VARIANTS: EQ3/6 3245, EQ3/EQ6 EQ3NR, EQ6 3/15/84

CODE TYPE: GEOCHEMISTRY

DESCRIPTION: EQ3 PERFORMS DISTRIBUTION-OF-SPECIES CALCULATIONS FOR NATURAL WATER COMPOSITIONS; EQ6 USES THE RESULTS OF EQ3 TO PREDICT THE CONSEQUENCES OF HEATING AND COOLING AQUEOUS SOLUTIONS AND OF IRREVERSIBLE REACTIONS IN ROCK-WATER SYSTEMS. THE NEWTON-RAPHSON METHOD IS USED TO SOLVE THE GOVERNING EQUATIONS OF CHEMICAL EQUILIBRIUM FOR A SYSTEM OF SPECIFIED ELEMENTAL COMPOSITION AT FIXED TEMPERATURE AND PRESSURE. THE MINERALS PRESENT IN THE STABLE PHASE ASSEMBLAGE ARE FOUND BY SEVERAL EMPIRICAL METHODS. REACTION PATH MODELS MAY BE GENERATED BY USING THIS APPROACH IN CONJUNCTION WITH FINITE DIFFERENCES. THIS METHOD IS ANALOGOUS TO APPLYING HIGH- ORDER PREDICTOR-CORRECTOR METHODS TO INTEGRATE A CORRESPONDING SET OF ORDINARY DIFFERENTIAL EQUATIONS. EQ3 COMPUTES FROM INPUT ANALYTICAL DATA THE DISTRIBUTION OF CHEMICAL SPECIES (IONS, NEUTRAL SPECIES, ION PAIRS, AND COMPLEXES) IN AN AQUEOUS SOLUTION. THIS CALCULATION PRODUCES A MODEL OF THE FLUID, WHICH SPECIFIES THE CONCENTRATION AND THERMODYNAMIC ACTIVITY OF EACH CHEMICAL SPECIES OCCURRING IN THE CHEMICAL SYSTEM. THE PROGRAM THEN CALCULATES THE SATURATION STATE OF THE FLUID WITH RESPECT TO ALL RELEVANT MINERAL PHASES IN THE DATA BASE. MASS TRANSFER AND THE EFFECTS OF HEATING AND COOLING AQUEOUS SOLUTIONS AND OF IRREVERSIBLE REACTION IN ROCK-WATER SYSTEMS ARE MODELED.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): TOM WOLERY, LLNL, (415) 422-5789
W.M. MURPHY, BWIP, (509) 376-2456
P.L. CLOKE, SAIC, (702) 794-7000

REFERENCE: THOMAS J. WOLERY, EQ3NR A COMPUTER PROGRAM FOR GEOCHEMICAL AQUEOUS SPECIATION-SOLUBILITY CALCULATIONS: USER'S GUIDE AND DOCUMENTATION, UCRL-53414, APRIL 18, 1983.

CODE NAME: ET 2.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: ANALYSIS OF AQUIFER OF RESERVOIR RESPONSE TO EARTH TIDES
OR OCEAN TIDES.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, PERSONAL COMPUTER, VAX, IBM
COMPATIBLE, CDC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, USAGE FEE REQUIRED

RESPONDENT(S): BRIAN Y. KANEHIRO
BERKELEY HYDROTECHNIQUE, INC.
(415) 549-9570

REFERENCE: UNKNOWN

CODE NAME: FACSIM

VARIANTS: NONE

CODE TYPE: OPERATIONS AND LOGISTICS
SYSTEM MODELING

DESCRIPTION: SIMULATES THE OPERATIONS OF REPOSITORY SURFACE FACILITY
OR MRS. USED TO STOCHASTICALLY ASSESS MATERIAL QUEUING
DUE TO EQUIPMENT FAILURES, PROCESS FLOW BLOCKAGES, OR
NORMAL PROCESS OPERATIONS.

COMMENTS: KNOWLEDGE OF SIMAN REQUIRED TO MODIFY FACILITY LAYOUT.

COMPUTER(S): VAX

INTERFACES: PREPROCESSOR - WASTES

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): MICHAEL R. SHAY
PNL
(509) 376-4654

REFERENCE: UNKNOWN

CODE NAME: FD3INV

VARIANTS: TRECOTT-INVERT

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: A QUASI -3D FINITE DIFFERENCE CODE INCORPORATED WITH
AUTOMATIC OPTIMIZATION PROGRAM. A QUASI -3D "INVERSE"
OR "PARAMETER IDENTIFICATION" PROGRAM.

COMMENTS: NONE

COMPUTER(S): UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ALLEN LU
BWIP
(509) 376-1113

REFERENCE: UNKNOWN

CODE NAME: FE2INV

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: THE GENERALIZED LEAST-SQUARES ALGORITHM EMPLOYS BAYESIAN THEORY AND EMPHASIZES THE SEQUENTIAL NATURE OF THE PROBLEM. ADJOINT EQUATIONS AND FLOW EQUATIONS ARE SOLVED TO PROVIDE AN EFFICIENT CALCULATION OF SENSITIVITY COEFFICIENTS.

COMMENTS: 2-D "INVERSE" OR PARAMETER IDENTIFICATION CODE USED FOR PUMPING TEST ANALYSIS.

COMPUTER(S): VAX, CRAY, UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ALLEN LU
BWIP
376-1113

REFERENCE: UNKNOWN

CODE NAME: FE2SEN

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: FLOW EQUATIONS AND ADJOINT EQUATIONS ARE SOLVED ON 2-D FINITE ELEMENT SCHEMES. THE CODE IS ABLE TO SIMULATE A CLASSICAL LEAKY AQUIFER AND CALCULATE THE SENSITIVITY COEFFICIENTS, DEFINED AS DERIVATIVE OF HYDRAULIC HEAD WITH RESPECT TO THE CHANGE OF TRANSMISSIVITY.

COMMENTS: 2-D FINITE ELEMENT GROUNDWATER AND SENSITIVITY CODE USED FOR TEST ANALYSIS AND SENSITIVITY ANALYSIS.

COMPUTER(S): UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ALLEN LU
BWIP
376-1113

REFERENCE: UNKNOWN

CODE NAME: FE3DGW 1.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
SYSTEM MODELING

DESCRIPTION: FE3DGW (FINITE ELEMENT 3-DIMENSIONAL GROUNDWATER FLOW)
IS A CODE FOR SIMULATING SATURATED GROUNDWATER FLOW IN A
HOMOGENEOUS OR HETEROGENEOUS GEOLOGICAL SYSTEM. THE
MODEL IS CAPABLE OF SIMULATING SINGLE- OR MULTI-LAYERED
AQUIFER SYSTEMS WITH POINT OR DISTRIBUTED WITHDRAWALS
AND RECHARGES. AUXILIARY PROGRAMS HAVE BEEN DEVELOPED TO
PLOT GRID VALUES, CONTOUR MAPS AND 3D CHARTS OF BOTH THE
INPUT DATA AND OUTPUT RESULTS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): SUMANT GUPTA
ONWI
(614) 424-5074

REFERENCE: GUPTA, S. K., COLE, CHARLIE R., BOND, F. W., AND MONTI,
A. M. FINITE-ELEMENT THREE-DIMENSIONAL GROUND-WATER
(FE3DGW) FLOW MODEL: FORMULATION, COMPUTER SOURCE
LISTINGS AND USER'S MANUAL. BMI/ONWI-548, OCTOBER 1984,
OFFICE OF NUCLEAR WASTE ISOLATION, BATTELLE MEMORIAL
INSTITUTE, COLUMBUS, OHIO.

CODE NAME: FE3INV

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: AN EXTENSION OF FE2INV. A 3-D "INVERSE" OR "PARAMETER ESTIMATIONS" CODE.

COMMENTS: NONE

COMPUTER(S): UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ALLEN LU
BWIP
(509) 376-1113

REFERENCE: UNKNOWN

CODE NAME: FE3SEN

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: AN EXTENSION OF FE2SEN. 3-D FINITE ELEMENT GROUNDWATER
AND SENSITIVITY CODE USED FOR 3-D SIMULATION OF
GROUNDWATER FLOW AND SENSITIVITY ANALYSIS.

COMMENTS: NONE

COMPUTER(S): UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): ALLEN LU
BWIP
(509) 376-1113

REFERENCE: UNKNOWN

CODE NAME: FECTRA 1.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: COMPUTES CONVECTION DIFFUSION EQUATION WITH SORPTION AND RADIOACTIVE DECAY FOR SINGLE SOLUTE OR MULTIPLE SOLUTES WITH NO SORPTION OR DECAY (OR SOME SORPTION AND DECAY).

COMMENTS: NONE

COMPUTER(S): MAINFRAME, PERSONAL COMPUTER, CRAY

INTERFACES: PREPROCESSOR - MAGNUM-3D, V.4.0

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): R.C. ARNETT
BWIP
(509) 376-8181

REFERENCE: UNKNOWN

CODE NAME: FEHMS 1

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
GEOSPHERE TRANSPORT

DESCRIPTION: FEHMS MODELS THE COUPLED THERMAL HYDROLOGIC/STRESS
BEHAVIOR IN ROCK. FOR EXAMPLE, IT WILL BE USED TO
INVESTIGATE THE EFFECTS OF THERMAL CHANGES ON THE
IN-SITU STRESS OF YUCCA MT. AND THUS ON THE HYDROLOGY
AND TRANSPORT OF RADIONUCLIDES. THE CODE IS BASED ON A
HYBRID FINITE ELEMENT FORMULATION.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): G. ZYVOLSKI
LOS ALAMOS NATIONAL LABORATORY
(505) 667-4156

REFERENCE: UNKNOWN

CODE NAME: FEMTRAN

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: FEM PROGRAM FOR SIMULATION OF 2-D TRANSPORT OF
RADIONUCLIDE DECAY CHAINS THROUGH SATURATED/UNSATURATED,
SORBING POROUS MEDIA. TRANSPORT MECHANISMS INCLUDE
ADVECTION HYDRODYNAMIC DISPERSION, DIFFUSION,
EQUILIBRIUM SORPTION AND RADIOACTIVE DECAY AND
EVOLUTION. ACCEPTS PROCEDURE IN VELOCITY FIELDS FROM
SAGUARO, NORIA, OR NORIA2

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: PREPROCESSOR - NORIA, NORIA2, SAGUARO

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): R.C. DYKHUIZEN
SANDIA NATIONAL LABS
FTS 844-7694

REFERENCE: UNKNOWN

CODE NAME: FICA 1

VARIANTS: NONE

CODE TYPE: OPERATIONS AND LOGISTICS
TRANSPORTATION

DESCRIPTION: THE FACILITY INTERFACE CAPABILITY ASSESSMENT PROGRAM
ALLOWS THE USER TO MAINTAIN A SERIES OF DBASE III
DATABASE FILES CONTAINING SITE AND REACTOR CAPABILITY
INFORMATION. THE MAIN MENU ALLOWS YOU TO DELETE, UPDATE
OR ADD RECORDS. THE USER MAY ALSO REGENERATE FILLED
DATABASE VALUES AND PRINT REPORTS TO THE PRINTER OR TO A
FILE.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): W.J. LEE
NUCLEAR ASSURANCE CORPORATION
(404) 447-1144

REFERENCE: NUCLEAR ASSURANCE CORPORATION, "FACILITY INTERFACE
CAPABILITY ASSESSMENT, DATA BASE REPORT", ORNL/SUB/86-
97393/2, 1987, OAK RIDGE NATIONAL LABORATORY, OAK RIDGE,
TN.

CODE NAME: FLEXBLAN

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS

DESCRIPTION: CALCULATES THE FLEXURAL STRENGTH OF GROUT AND CONCRETE.

COMMENTS: NOTE: REFERENCE PROCEDURE ASTM C29

COMPUTER(S): PERSONAL COMPUTER

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER
295-7848

REFERENCE: UNKNOWN

CODE NAME: FLOW AND SOLUTE TRANSPORT

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: FLOW IN NETWORKS OF DISCRETE FRACTURES BY FINITE ELEMENT
METHOD. TRANSPORT IN NETWORK OF DISCRETE FRACTIONS BY
METHOD OF CHARACTERISTICS.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): KENZI KARASAKI
LBL
(415) 486-6759

REFERENCE: UNKNOWN

CODE NAME: FRANET 2.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: ANALYSIS OF TRANSIENT FLUID FLOW IN LARGE DISCRETE FRACTURE SYSTEMS. TWO-DIMENSIONAL, FINITE ELEMENT CODE.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, USAGE FEE REQUIRED

RESPONDENT(S): BRIAN Y. KANEHIRO
BERKELEY HYDROTECHNIQUE, INC.
(415) 549-9570

REFERENCE: UNKNOWN

CODE NAME: GASDOSE

VARIANTS: NONE

CODE TYPE: AIR DISPERSION
DOSE-TO-MAN

DESCRIPTION: THE GASDOSE PROGRAM CALCULATES RADIATION DOSES RESULTING FROM GASEOUS EFFLUENTS TO OFF-SITE INDIVIDUALS AND POPULATIONS USING MEASURED DATA ON METEOROLOGY, GASEOUS ACTIVITY RELEASE RATES DURING NORMAL OPERATION, POPULATION DISTRIBUTIONS AND FOOD CONSUMPTION PATTERNS.

COMMENTS: NONE

COMPUTER(S): UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): J. SCHULZ
BECHTEL WESTERN POWER CORP.
(415) 768-1239

REFERENCE: UNKNOWN

CODE NAME: GASPAR

VARIANTS: GASPAR, REV2.1, NUS.F77

CODE TYPE: AIR DISPERSION
DOSE-TO-MAN

DESCRIPTION: PROGRAM TO EVALUATE RADIOLOGICAL IMPACTS DUE TO THE
RELATION OF RADIOLOGICAL MATERIAL TO THE ATMOSPHERE
DURING NORMAL OPERATION OF LIGHT WATER REACTORS.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): RICHARD HOLDER
NUS CORPORATION
(301) 258-6000

REFERENCE: K. F. ECHERMAN, F. J. CONGEL, A. K. ROECKLEIN, W. J.
PASCIAK, "USER'S GUIDE TO GASPAR CODE," NUREG-0597 (JUNE
1980).

CODE NAME: GDEN

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
GEOSPHERE TRANSPORT

DESCRIPTION: CALCULATES GRAIN DENSITY OF A PULVERIZED ROCK OR SOIL
SAMPLE, RELATIVE DENSITY OF THE WATER USED IN THE TEST,
ACTUAL WEIGHT OF 100CC OF TEST WATER, AND WEIGHT OF
WATER DISPLACED BY THE SAMPLE.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, PERSONAL COMPUTER

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER
295-7874

REFERENCE: C.R.C. HANDBOOK OF PHYSICAL PROPERTIES AND ASTM
PROCEDURE D854-58, "SPECIFIC GRAVITY OF SOILS"

CODE NAME: GENERALIZED PLANE COORDINATE

VARIANTS: NONE

CODE TYPE: MAPPING

DESCRIPTION: TRANSFORM GEOGRAPHIC TO PLANE COORDINATES OR UTM OR VICE
VERSA.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W. H. MCINTOSH
ONWI
(614) 424-5797

REFERENCE: UNKNOWN

CODE NAME: GENIE 1.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: ANALYSIS OF GROUNDWATER FLOW, CHEMICAL TRANSPORT,
RADIONUCLIDE TRANSPORT IN FRACTURED, POROUS MEDIA.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, CDC, GRAY

INTERFACES: PREPROCESSOR - ANGEL

EXTERNAL FILES: NONE

ACQUISITION: YES, USAGE FEE REQUIRED

RESPONDENT(S): BRIAN Y. KANEHIRO
BERKELEY HYDROTECHNIQUE, INC.
(415) 549-9570

REFERENCE: UNKNOWN

CODE NAME: GEODETIC POSITION AND INVERSE

VARIANTS: NONE

CODE TYPE: MAPPING

DESCRIPTION: SOLVES FOR EITHER THE GEODETIC POSITION OR INVERSE
PROBLEM IN ANY QUADRANT OF THE EARTH.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.H. MCINTOSH
ONWI
(614) 424-5797

REFERENCE: UNKNOWN

CODE NAME: GEOSTAT 1.0
VARIANTS: GEOSTOKOS
CODE TYPE: SYSTEM MODELING
DESCRIPTION: GEOSTATISTICAL ANALYSIS.
COMMENTS: NONE
COMPUTER(S): VAX
INTERFACES: NONE
EXTERNAL FILES: ANY DATA SET
ACQUISITION: NO, PROPRIETARY
RESPONDENT(S): W.V. HARPER
ONWI
(614) 424-5099
REFERENCE: UNKNOWN

CODE NAME: GEOTHER/VTH

VARIANTS: GEOTHER

CODE TYPE: GEOSPHERE TRANSPORT
THERMAL

DESCRIPTION: GEOTHER SIMULATES FLUID AND HEAT FLOW IN SINGLE AND TWO PHASE GEOTHERMAL RESERVOIRS. IN ADDITION TO THREE-DIMENSIONAL CARTESIAN GEOMETRY, IT CAN TREAT TWO-DIMENSIONAL CYLINDRICAL GEOMETRY. FLUID FLOW AND HEAT TRANSPORT ARE DESCRIBED BY TWO COUPLED EQUATIONS THAT ARE POSED IN TERMS OF FLUID PRESSURE AND ENTHALPY. ALL THERMODYNAMIC PROPERTIES ARE ALSO SPECIFIED AS FUNCTIONS OF PRESSURE AND ENTHALPY. THE CODE ASSUMES LOCAL THERMAL EQUILIBRIUM BETWEEN ROCK AND FLUID, AND USE POROUS MEDIA APPROXIMATIONS. THE THERMODYNAMIC FUNCTIONS INCLUDED IN THE CODE ARE LIMITED TO PRESSURES LESS THAN 150 BARS AND TEMPERATURES LESS THAN 320°C, AND IT WOULD BE DIFFICULT TO MODIFY THE PROGRAM FOR FLUIDS WITH PROPERTIES SIGNIFICANTLY DIFFERENT FROM THOSE OF PURE WATER.

COMMENTS: REQUIRED DOCUMENTATION AS WELL AS VERIFICATION AND VALIDATION ACTIVITIES ARE PLANNED IN CONJUNCTION WITH THE DEVELOPMENT OF THE NT4 VERSION OF THE CODE.

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): MARYANNE KUMMERER
ROCKWELL HANFORD OPERATIONS
(509) 376-6629

REFERENCE: INTERA ENVIRONMENTAL CONSULTANTS, INC., GEOTHER: A TWO-PHASE FLUID FLOW AND HEAT TRANSPORT CODE, ONWI-434, APRIL 1983.

CODE NAME: GRAPH

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: RECONSTRUCTION AND IMAGE DISPLAY FOR COMPUTED IMPEDANCE
TOMOGRAPHY - USES BACK PROJECTION TECHNIQUES.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): WILLIAM DAILY
LLNL
(415) 422-8623

REFERENCE: UNKNOWN

CODE NAME: GRASP 0.0

VARIANTS: SWENT, 400-03C-01B

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: GRASP ADDRESSES THE SENSITIVITY OF THE GROUNDWATER SYSTEM RESPONSE TO THE PARAMETER UNCERTAINTY.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.V. HARPER
ONWI
(614) 424-5099

REFERENCE: J. L. WILSON, B. S. RAMARAO, AND J. A. MCNEISH, "GRASP: A COMPUTER CODE TO PERFORM POST-SWENT ADJOINT SENSITIVITY ANALYSIS OF STEADY-STATE GROUND-WATER FLOW", BMI/ONWI-625, NOVEMBER 1986, BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OH.

CODE NAME: GRESS

VARIANTS: NONE

CODE TYPE: SYSTEM MODELING

DESCRIPTION: SENSITIVITY ANALYSIS OF FORTRAN CODES.

COMMENTS: NONE

COMPUTER(S): IBM, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): W.V. HARPER
ONWI
(614) 424-5099

REFERENCE: J. E. HORWEDEL, E. M. OBLow, B. A. WORLEY, F. G. PIN,
"GRESS USER'S MANUAL," ORNL/TM-10835 (TO BE PUBLISHED).

CODE NAME: GRID COORDINATE CONVERSION

VARIANTS: NONE

CODE TYPE: MAPPING

DESCRIPTION: TRANSFORM GEOGRAPHIC TO PLANE COORDINATES OR UTM OR VICE
VERSA. OPERATES IN AN INTERACTIVE MODE.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.H. MCINTOSH
ONWI
(614) 424-5797

REFERENCE: UNKNOWN

CODE NAME: GRIDEM

VARIANTS: NONE

CODE TYPE: MAPPING

DESCRIPTION: STANDARD USGS-FORMAT DIGITAL ELEVATION MODELS IN A GRIDDED PATTERN CAN BE REGRIDDED TO A DIFFERENT INTERVAL, ORIENTATION, AND/OR PROJECTION.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.H. MCINTOSH
ONWI
(614) 424-5797

REFERENCE: UNKNOWN

CODE NAME: GROUTMIX

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS

DESCRIPTION: CALCULATES COMPRESSIVE STRENGTH FROM LOAD FOR GROUT AND
CONCRETE.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER
295-7848

REFERENCE: UNKNOWN

CODE NAME: GS-CAM1

VARIANTS: NONE

CODE TYPE: MAPPING

DESCRIPTION: THIS SERIES OF ROUTINES FORMS THE GENERAL CARTOGRAPHIC TRANSFORMATION PACKAGE THAT PERMITS THE TRANSFORMATION OF COORDINATE PAIRS FROM ONE OF 20 MAP PROJECTIONS TO ANOTHER.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.H. MCINTOSH
ONWI
(614) 424-5795

REFERENCE: UNKNOWN

CODE NAME: HDOC

VARIANTS: HDOC1

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: SOLVES 1-D TRANSIENT, UNSAT./SAT FLOW AND TRANSPORT OF
RADIOACTIVE, SORBING SPECIES VIA DYNAMICS OF CONTOURS
METHOD.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, PERSONAL COMPUTER, VAX, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): BRYAN J. TRAVIS
LOS ALAMOS NATIONAL LABORATORY
(505) 667-1259

KENNETH EGGERT
LANL/LLNL
(505) 667-1254

REFERENCE: UNKNOWN

CODE NAME: HEADCO 1.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: PROGRAM CAN BE USED TO CONVERT STATIC WATER-LEVEL AND PRESSURE MEASUREMENTS TO FORMATION PRESSURE AND STANDARD HYDRAULIC HEAD. THE PROGRAM CORRECTS FIELD MEASUREMENTS FOR THE EFFECTS OF FLUID-DENSITY AND SELECTED EXTERNAL STRESSES.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): R.B. MERCER
O&T/SCFI/HTG
3-5100

REFERENCE: UNKNOWN

CODE NAME: HEATING5/6

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: HEAT CONDUCTION CODE.

COMMENTS: MODELING EQUIPMENT TRANSIENT HEAT TRANSFER FOR
ASSESSING EQUIPMENT SURVIVABILITY DURING A HYDROGEN
BURN.

COMPUTER(S): MAINFRAME, MINI, IBM

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): R. TOYOAKA G.E. GILES
BASALT WASTE ISOL. PROJ. ORNL
(509) 376-0338 (615)-574-8667

REFERENCE: D. C. ELROD, G. E. GILES, AND W. D. TURNER, "HEATING6:
A MULTIDIMENSIONAL HEAT CONDUCTION ANALYSIS WITH THE
FINITE-DIFFERENCE FORMULATION," NUREG/CR-0200, VOLUME
#2, SECTION F10, ORNL/NUREG/CSD-2/V2 (OCTOBER 1981).

CODE NAME: HEC (1 & 2)

VARIANTS: NONE

CODE TYPE: BIOSPHERE TRANSPORT

DESCRIPTION: HEC-1: SIMPLE EVENT COMPUTER PROGRAM TO ESTIMATE RUNOFF FROM DISCRETE RAINFALL EVENTS.
HEC-2: CALCULATES WATER SURFACE ELEVATIONS AS CROSS-SECTIONS OF NATURAL CHANNELS.

COMMENTS: NONE

COMPUTER(S): MINI, PERSONAL COMPUTER

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): JERRY JACKSON
ONWI
(614) 424-4783

REFERENCE: UNKNOWN

CODE NAME: HEFF

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS
THERMAL

DESCRIPTION: PERFORMS TWO-DIMENSIONAL THERMAL AND STRESS ANALYSES FOR REPOSITORIES IN LINEAR ELASTIC MEDIA BASED ON THE SAME FORMULATION AS BEH2D. HOWEVER, IT DOES NOT INCLUDE THE FORMULATION FOR MODELING SLIP OR SEPARATION OF JOINTS.

COMMENTS: NONE

COMPUTER(S): IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): C. ST. JOHN
AGAPITO & ASSOCIATES
(213) 544-0474

REFERENCE: UNKNOWN

CODE NAME: HELG

VARIANTS: HELG17, 17GR, STAT

CODE TYPE: GEOCHEMISTRY

DESCRIPTION: CALCULATE THERMODYNAMIC PROPERTIES OF REACTIONS FROM
EXPERIMENTAL DATA.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): ROBERT W. SMITH
ROCKWELL HANFORD OPERATIONS
(509) 376-1349

REFERENCE: UNKNOWN

CODE NAME: HEXGEN 1.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: GENERATES A STOCHASTIC FRACTURE NETWORK FOR ANALYSIS OF
WATER AND NUCLIDE TRANSPORT THROUGH A BASALT COLONNADE.

COMMENTS: NONE

COMPUTER(S): NONE

INTERFACES: PREPROCESSOR - MAGNUM-2D

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): TIM LEGORE
 BASALT WASTE ISOLATION PROJECT
 (509) 376-6310

REFERENCE: UNKNOWN

CODE NAME: HIGHWAY 3.0

VARIANTS: NONE

CODE TYPE: TRANSPORTATION
OPERATIONS AND LOGISTICS

DESCRIPTION: ESTIMATES ROUTES FOR TRUCK SHIPMENTS. SPECIAL
CONSTRAINTS MAY BE USED TO ESTIMATE ROUTES FOR HIGHWAY
CONTROLLED QUANTITIES OF RADIOACTIVE MATERIAL.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, IBM

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): DAVID JOY
ORNL
FTS 626-2068

REFERENCE: D. S. JOY, P. E. JOHNSON AND S. M. GIBSON, "HIGHWAY, A
TRANSPORTATION ROUTING MODEL: PROGRAM DESCRIPTION AND
USER'S MANUAL, ORNL/TM-8419, DEC. 1982, OAK RIDGE
NATIONAL LABORATORY, OAK RIDGE, TN.

CODE NAME: HMR52

VARIANTS: NONE

CODE TYPE: RISK ASSESSMENT

DESCRIPTION: PROGRAM IS USED TO DETERMINE PROBABLE MAXIMUM STORMS.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): JERRY JACKSON
ONWI
(614) 424-4783

REFERENCE: UNKNOWN

CODE NAME: HPRM

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS

DESCRIPTION: CALCULATES HELIUM PERMEABILITY THROUGH SOLID MEDIUM,
SUCH AS A ROCK CORE. PROGRAM CONTAINS FLOWMETER
CALIBRATION CURVES.

COMMENTS: NONE

COMPUTER(S): MAINFRAME

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER
295-7848

REFERENCE: UNKNOWN

CODE NAME: HYDRA-II

VARIANTS: HYDRA-I

CODE TYPE: THERMAL

DESCRIPTION: GENERAL PURPOSE THREE-DIMENSIONAL HYDROTHERMAL CODE THAT SOLVES ENERGY, MOMENTUM, CONTINUITY CONSERVATION EQUATIONS. THIS FINITE DIFFERENCE CODE CAN CALCULATE TEMPERATURES WITHIN CANISTERS CONTAINING SPENT FUEL SUB-ASSEMBLIES. THE CODE EXPLICITLY TREATS CONDUCTION, CONVECTION AND THERMAL RADIATION IN A FULLY COUPLED FASHION, AND IN THIS SENSE DIFFERS FROM THAT OF COX WHICH ONLY TREATS RADIATION. THE CODE IS INTENDED PRIMARILY TO PROVIDE STEADY-STATE SOLUTIONS BUT HAS BEEN USED FOR TRANSIENT PROBLEMS. IT CAN ALSO COMPUTE THE INTERNAL PRESSURE DISTRIBUTION AND GAS VELOCITIES. THE DOUGLAS AND GUNN TECHNIQUE IS USED FOR THE ENERGY EQUATION. INERTIAL FORCES ARE ASSUMED SMALL COMPARED TO VISCOUS FORCES FOR THE CONVECTIVE FLOW, AND THE SURFACES OF THE FUEL RODS ARE ASSUMED TO EMIT AND REFLECT RADIATION DIFFUSELY.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, CDC, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): R.A. MCCANN
BATTELLE NORTHWEST
(509) 375-2488

REFERENCE: R. A. MCCANN, HYDRA-II: A HYDROTHERMAL ANALYSIS COMPUTER CODE, VOLUME I, EQUATIONS AND NUMERICS, PNL-6206 VOL. I, APRIL 1987.

CODE NAME: ILLUDAS

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: PRESENTS AN OBJECTIVE METHOD FOR THE HYDROLOGIC DESIGN
OF A STORM DRAINAGE SYSTEM. USED WIDELY FOR URBAN
AREAS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): JOHN HAWKINS
HOLMES AND NARVER
295-7739

REFERENCE: UNKNOWN

CODE NAME: IMAGES 3-D 1.2

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS

DESCRIPTION: A GENERAL PURPOSE STATIC AND DYNAMIC STRUCTURAL ANALYSIS PROGRAM. ONLY ELASTIC ANALYSES ARE AVAILABLE.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, USAGE FEE REQUIRED

RESPONDENT(S): STEVEN LEFTWICH
BECHTEL NATIONAL INC.
(415) 768-1234

REFERENCE: UNKNOWN

CODE NAME: INCAV.BAS
VARIANTS: NONE
CODE TYPE: ROCK MECHANICS
DESCRIPTION: CALCULATES MEAN PALEOMAGNETIC INCLINATION VALUES FOR
BOREHOLE INCLINATION ONLY PALEOMAGNETIC MEASUREMENTS.
COMMENTS: NONE
COMPUTER(S): PERSONAL COMPUTER
INTERFACES: NONE
EXTERNAL FILES: NONE
ACQUISITION: YES, NONPROPRIETARY
RESPONDENT(S): R.D. LANDON
BWIP
(509) 376-6258
REFERENCE: UNKNOWN

CODE NAME: INTERLINE

VARIANTS: NONE

CODE TYPE: TRANSPORTATION
OPERATIONS AND LOGISTICS

DESCRIPTION: ESTIMATES LIKELY ROUTES OVER U.S. RAILROAD SYSTEM. ALSO
CAPABLE OF CALCULATING BARGE ROUTES AND BARGE/RAIL
INTERCHANGE POINTS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, IBM

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DAVID JOY
ORNL
FTS 626-2068

REFERENCE: B. E. PETERSON, INTERLINE, A RAILROAD ROUTING MODEL:
PROGRAM DESCRIPTION AND USER'S MANUAL, ORNL/TM-8944,
NOVEMBER 1985.

CODE NAME: ISABAND

VARIANTS: NONE

CODE TYPE: GEOCHEMISTRY

DESCRIPTION: RESOLVES INTO COMPONENTS IN THE INDIVIDUAL F CENTER AND COLLOIDAL OPTICAL ABSORPTION BANDS THAT ARE SUPERIMPOSED IN OPTICAL EXTINCTION DATA.

COMMENTS: NONE

COMPUTER(S): IBM, VAX, CDC

INTERFACES: PREPROCESSOR - COLFIT, COLSPEC

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): P.W. LEVY
BROOKHAVEN NATIONAL LAB.
FTS 666-3820

REFERENCE: UNKNOWN

CODE NAME: ISCLT/ST

VARIANTS: NONE

CODE TYPE: AIR DISPERSION

DESCRIPTION: (INDUSTRIAL SOURCE COMPLEX - LONGTERM). AN ADVANCED GAUSSIAN PLUME MODEL FOR MODELING ATMOSPHERIC DISPERSION OF NON-RADIOACTIVE POLLUTANTS, USING STATISTICAL WIND SUMMARIES TO CALCULATE QUARTERLY OR ANNUAL GROUND- LEVEL CONCENTRATIONS OF EMISSIONS. THE SHORT TERM (ST) VERSION USES HOURLY METEOROLOGICAL DATA TO CALCULATE CONCENTRATIONS FOR TIME PERIODS UP TO 24 HOURS.

COMMENTS: NONE

COMPUTER(S): CDC

INTERFACES: NONE

EXTERNAL FILES: METEROLOGICAL DATA FILE

ACQUISITION: YES, RUN ACCESS ONLY

RESPONDENT(S): MARK D. OTIS
EG&G, INC.
(208) 526-0603

MIKE SEPTOFF
NUS
(301) 258-6000

REFERENCE: UNKNOWN

CODE NAME: ISM 6.920

VARIANTS: NONE

CODE TYPE: MAPPING

DESCRIPTION: AN INTERACTIVE SYSTEM FOR SURFACE AND SUB-SURFACE
MAPPING. CREATES TOPOGRAPHICAL, BLOCK, CROSS-SECTION AND
FENCE MAP AS WELL AS VOLUMETRICS.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): D.L. SAUL
BWIP SITE DEPARTMENT
6-8719

REFERENCE: UNKNOWN

CODE NAME: ISOQUAD

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: ISOQUAD IS USED TO CALCULATE GROUNDWATER FLOW AND TRANSPORT FOR A SINGLE CONSTITUENT WITHOUT DECAY OR SORPTION. THIS MODEL USES A GALERKIN APPROXIMATION WITH VARIOUS BASIS FUNCTIONS, WITH A FINITE-ELEMENT INTEGRATION SCHEME TO SOLVE THE CONSERVATIVE TRANSPORT EQUATION. THE TIME INTEGRATION IS PERFORMED THROUGH A BACKWARD DIFFERENCE TIME SCHEME. THE MAJOR COMPUTER MODELS OF THIS TYPE ARE PRESENTLY RESTRICTED TO CONSIDERING TWO-DIMENSIONAL FLOW SYSTEMS. ACCORDINGLY, THE SEGOL MODEL WITH POTENTIAL THREE-DIMENSIONAL AND COMBINED SATURATED AND PARTIALLY SATURATED FLOW MAY BE A MORE JUDICIOUS MODEL TO CONSIDER.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): G.E. BARR
SANDIA NATIONAL LABS
FTS 844-8532

REFERENCE: UNKNOWN

CODE NAME: ISOSHL D

VARIANTS: NONE

CODE TYPE: NUCLEAR RADIATION TRANSPORT

DESCRIPTION: SHIELDING CODE (ABBREVIATED MODELS).

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): S. WOOLFOLK
SAIC
FTS 575-1875

REFERENCE: R. L. ENGLE, J. GREENBORG, AND M. M. HENDRICKSON,
"ISOSHL D - A COMPUTER CODE FOR GENERAL PURPOSE ISOTOPE
SHIELDING ANALYSIS", BNWL-236 (JUNE 1966) AND SUPPLEMENT
(MARCH 1967).

CODE NAME: JAC (2D/3D)

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS

DESCRIPTION: JAC IS A 2-DIMENSIONAL FINITE ELEMENT PROGRAM FOR THE NONLINEAR QUASISTATIC RESPONSE OF SOLIDS WITH THE CONJUGATE GRADIENT METHOD. THE COMPLIANT JOINT ROCK MATERIAL MODEL IS USED TO MODEL THE JOINT/ROCK MASS AS AN EQUIVALENT CONTINUUM WITH NONLINEAR JOINT NORMAL AND SHEAR RESPONSE. JAC USES A NINE-NODE LAGRANGIAN ELEMENT AND SUCCESSFULLY TREATS HIGHLY PLASTIC MATERIALS. THE 3D PROGRAM WILL COMPUTE QUASISTATIC, LARGE DEFORMATION, INELASTIC RESPONSE OF SOLIDS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): JOHN BIFFLE
SANDIA NATIONAL LABORATORIES
(505) 844-5385

REFERENCE: J. H. BIFFLE, JAC - A TWO-DIMENSIONAL FINITE ELEMENT COMPUTER PROGRAM FOR THE NON-LINEAR QUASISTATIC RESPONSE OF SOLIDS WITH THE CONJUGATE GRADIENT METHOD, SAND81-0998, APRIL 1984.

CODE NAME: K603

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS

DESCRIPTION: FINITE DIFFERENCE GEOSTATISTICAL CODE [KRIGING
(UNIVERSAL)].

COMMENTS: ORIGINATORS - U.S.G.S.

COMPUTER(S): MAINFRAME, CDC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): G.E. BARR
SANDIA NATIONAL LABS
FTS 844-8532

REFERENCE: UNKNOWN

CODE NAME: KENO

VARIANTS: KENO IV, KENO IV/CG, KENO V, KENO V.A.

CODE TYPE: NUCLEAR RADIATION TRANSPORT

DESCRIPTION: KENO-IV IS A MULTIGROUP MONTE CARLO CRITICALITY PROGRAM WRITTEN FOR IBM 360 COMPUTERS. IT EXECUTES RAPIDLY AND IS FLEXIBLY DIMENSIONED SO THE ALLOWED SIZE OF A PROBLEM (I.E., THE NUMBER OF ENERGY GROUPS, NUMBER OF GEOMETRY CARDS, ETC., IS ARBITRARY) IS LIMITED ONLY BY THE TOTAL DATA STORAGE REQUIRED. THE INPUT DATA, WITH THE EXCEPTION OF CROSS SECTIONS, FISSION SPECTRA, AND ALBEDOS, MAY BE ENTERED IN FREE FORM. THE GEOMETRY INPUT IS QUITE SIMPLE TO PREPARE, AND COMPLICATED THREE-DIMENSIONAL SYSTEMS CAN OFTEN BE DESCRIBED WITH A MINIMUM OF EFFORT. THE RESULTS CALCULATED BY KENO-IV INCLUDE K-EFFECTIVE, LIFETIME AND GENERATION TIME, ENERGY-DEPENDENT LEAKAGES AND ABSORPTIONS, ENERGY- AND REGION-DEPENDENT FLUXES, AND REGION-DEPENDENT FISSION DENSITIES. CRITICALITY SEARCHES CAN BE MADE ON UNIT DIMENSIONS OR ON THE NUMBER OF UNITS IN AN ARRAY.

COMMENTS: NONE

COMPUTER(S): CDC, IBM, CRAY

INTERFACES: PREPROCESSOR - CS.S4

EXTERNAL FILES: CSRL-IV, HANSEN-ROACH

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): L.M. PETRIE
ORNL
(615) 574-5259

REFERENCE: L. M. PETRIE AND N. F. CROSS, "KENO-IV - AN IMPROVED MONTE CARLO CRITICALITY PROGRAM," ORNL 4938 (NOVEMBER 1975).

CODE NAME: KEYNUC 2.0

VARIANTS: EPANUC, VER. 1.0, KEYNUC, VER. 1.0,

CODE TYPE: SYSTEM MODELING
GEOSPHERE TRANSPORT

DESCRIPTION: SORTS RADIONUCLIDES ACCORDING TO HALF-LIFE, ABUNDANCE,
ETC. TO FIND THE "KEY" RADIONUCLIDES. THESE WILL BE
USED IN PA APPLICATIONS.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): R.J. VAN VLEET
BASALT WASTE ISOLATION PROJECT
(509) 376-4997

REFERENCE: UNKNOWN

CODE NAME: LASL OP2

VARIANTS: LLL OPT

CODE TYPE: ROCK MECHANICS

DESCRIPTION: CALCULATES HORIZONTAL DISPLACEMENT FOR DOWNHOLE
DRILLING.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DON SCOTT
HOLMES AND NARVER
295-3487

REFERENCE: UNKNOWN

CODE NAME: LAYFLO 1.00

VARIANTS: UCBNE 30

CODE TYPE: GEOSPHERE TRANSPORT
SYSTEM MODELING

DESCRIPTION: LAYFLO SOLVES THE 1D RADIONUCLIDE TRANSPORT EQUATIONS FOR A POROUS MEDIUM INCLUDING THE EFFECTS OF ADVECTION, DISPERSION, LINEAR SORPTION AND THREE MEMBER DECAY CHAINS. SOLUTION IS BY LAPLACE TRANSFORMS USING A SEMI-ANALYTICAL APPROACH. THE MEDIUM CAN BE DIVIDED INTO UP TO SIX LAYERS WITH DISCRETE PROPERTIES. IF DISPERSION IS NEGLECTED ANY NUMBER OF LAYERS CAN BE CONSIDERED. THE SOURCE IS TAKEN AS OPERATING CONTINUOUSLY OR IN BAND RELEASE MODE. LAYFLO WAS FOUND TO GIVE GOOD AGREEMENT WITH THE CODES INCLUDED IN THE INTRACOIN BENCHMARKING STUDY FOR LEVEL 1, CASES 1 AND 1. AGREEMENT WITH EXPERIMENTAL DATA RELATING TO THE TRANSPORT OF NaCl HAS ALSO BEEN REPORTED.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: PREPROCESSOR - WAPPA-C 3.00

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): G. JANSEN
ONWI
(614) 424-7317

REFERENCE: A. B. GUREGHIAN AND G. JANSEN, LAYFLO: A ONE-DIMENSIONAL SEMIANALYTICAL MODEL FOR THE MIGRATION OF A THREE-MEMBER DECAY CHAIN IN A MULTILAYERED GEOLOGIC MEDIUM, ONWI-466, MAY 1983.

CODE NAME: LCCS

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS

DESCRIPTION: CALCULATES THE LENGTH-CORRECTED COMPRESSIVE STRENGTH OF
AN UNDERSIZED CYLINDRICAL SAMPLE.

COMMENTS: NONE

COMPUTER(S): MAINFRAME

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER, MTL
295-7848

REFERENCE: API PROCEDURE D-2938.

CODE NAME: LINEAR HORIZONTAL TRANSFORM

VARIANTS: NONE

CODE TYPE: MAPPING

DESCRIPTION: PERFORMS A LINEAR LEAST-SQUARES ADJUSTMENT OF MEASURED
X-Y COORDINATES TO "TRUE" OR KNOWN COORDINATES.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.H. MCINTOSH
ONWI
(614) 424-5797

REFERENCE: UNKNOWN

CODE NAME: LLUVIA

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: 1-D STEADY-STATE FLOW OF LIQUID THROUGH UNSATURATED
POROUS MEDIA. SOLVES ORDINARY DIFFERENTIAL EQUATION
USING RUNGE-KUTTA METHOD.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): P.L. HOPKINS
SANDIA NATIONAL LABS
846-1739

REFERENCE: UNKNOWN

CODE NAME: LOADCALC PC

VARIANTS: NONE

CODE TYPE: HVAC

DESCRIPTION: CALCULATES HEATING AND COOLING LOADS BASED UPON
LIGHTING, PEOPLE AND EQUIPMENT.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): ROY WHITE
HOLMES AND NARVER
295-7731

REFERENCE: 1985 ASHRAE HANDBOOK OF FUNDAMENTALS.

CODE NAME: LOGSIM

VARIANTS: NONE

CODE TYPE: TRANSPORTATION
OPERATIONS AND LOGISTICS

DESCRIPTION: AN ALTERNATE COST ESTIMATE OF TRANSPORTATION COST FOR
TOTAL SYSTEM LIFE CYCLE COST

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: PREPROCESSOR - WASTE

EXTERNAL FILES: REACTOR DBASE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): RONALD R. MACDONALD
ROY F. WESTON, INC.
692-3030, 2319

REFERENCE: UNKNOWN

CODE NAME: LODE

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: ORDINARY DIFFERENTIAL EQUATION SOLVER - GEAR'S ALGORITHM.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: PREPROCESSOR - RADIOL

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): LARRY MORGAN
PNL
375-3874

REFERENCE: LODE, NESC NO. 592.370B, USER'S MANUAL FOR LODE, NATIONAL ENERGY SOFTWARE CENTER NOTE 83-89, JULY 20, 1983.

CODE NAME: MAGNUM (2D/3D)

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
THERMAL

DESCRIPTION: MAGNUM IS A TWO-DIMENSIONAL (OR THREE-DIMENSIONAL) FINITE ELEMENT CODE DESIGNED TO SIMULATE TRANSIENT GROUNDWATER FLOW AND HEAT TRANSPORT IN FRACTURED-POROUS ROCK SYSTEMS. THE THEORETICAL FRAMEWORK OF THE CODE IS BASED ON CONCEPTS FOR A POROUS CONTINUUM AND FOR DISCRETE CONDUITS. IN PARTICULAR, A DUAL-POROSITY APPROACH IS USED TO REPRESENT THE CONTINUOUS ROCK MASS, WHERE FLOW THROUGH PLANAR CONDUITS IS DESCRIBED BY POISEUILLE'S EQUATION. THE MAGNUM-2D CODE MODELS A CONTINUOUS ROCK MASS REPRESENTED WITH ISOPARAMETRIC FINITE ELEMENTS; LINE ELEMENTS ARE EMBEDDED ALONG THE SIDES OF THE TWO- DIMENSIONAL ELEMENTS TO REPRESENT DISCRETE FRACTURES. THE MODEL ACCOMMODATES COMPLEX STRATIGRAPHIC FEATURES WITH VARIABLE MEDIA PROPERTIES AND PROVIDES OPTIONS FOR COUPLED OR UNCOUPLED SOLUTIONS OF HEAT AND FLOW EQUATIONS. THE CODE CAN BE USED TO CALCULATE THE FLUID FLOW AROUND A REPOSITORY DURING THE THERMAL PHASE. IT PROVIDES FLOW FIELD CALCULATIONS FOR INPUT TO PATHLINE AND TRANSPORT MODELS. RESULTS FROM MAGNUM-2D COULD PROVIDE BOUNDARY CONDITIONS TO FAR-FIELD FLOW CODES, SUCH AS USGS2D OR FE3DGW. THE CODE IS INTERFACED WITH THE CODES PATH AND CHAINT.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, CRAY

INTERFACES: POSTPROCESSOR- CHAINT, PATH, FECTRA

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY (2D V3.2)
NO, INCOMPLETE (3D V3.2)

RESPONDENT(S): DAVE LANGFORD, BWIP (509)376-6175
BRIAN Y. KANEHIRO, BERKELEY, (415)549-0570
NIAUL W. KLINE, BWIP (509)376-4634

REFERENCE: UNKNOWN

CODE NAME: MAGNUM POSTPROCESSORS
A) GRIDDER 3.01
B) NPRINT 2.01
C) PARAM 2.02
D) QFLUX 1.0
E) VELPLT 2.00

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: IN GENERAL, THESE POST-PROCESSORS REPRODUCE DATA IN A GRAPHICAL REPRESENTATION RATHER THAN STRAIGHT ASCII OR BINARY.

GRIDDER 3.01: WILL PLOT AND/OR TABULATE THE DESIRED RESULTS. THE ISSCO DISPLAY GRAPHIC PACKAGE IS REQUIRED.

NPRINT 2.01: SAME AS GRIDDER 3.01.

PARAM 2.02: SAME AS GRIDDER 3.01.

QFLUX 1.0: PERFORMS SOURCE/SINK CALCULATIONS OF A MAGNUM-2D VELOCITY FIELD.

VELPLT 2.00: SAME AS GRIDDER 3.01.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, CRAY

INTERFACES: PREPROCESSOR - MAGNUM

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ED CRAFT, BWIP, (509) 376-5407
DAVE LANGFORD, BWIP, (509) 376-6175
TIM LEGORE, BWIP, (509) 376-6310

REFERENCE: UNKNOWN

CODE NAME: MAGNUM PREPROCESSORS
A) BCGEN 2.0
B) CHTFLX 2.04
C) FEMESH 2.0
D) GEN 2.00
E) ICGEN 2.00
F) MERGE 2.00
G) MESHER 2.00
H) MOD 2.01

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: IN GENERAL, THE PRE-PROCESSORS WILL GENERATE 2D AND 3D MESH FOR INPUT TO MAGNUM-3D.

CHTFLX 2.04: COMPUTES MASS RELEASES AND RELEASE RATES. FLOW FIELD INFORMATION IS SUPPLIED BY MAGNUM. CONTAMINANT CONCENTRATIONS ARE SUPPLIED BY CHAINT.

ALL OTHERS: THEY WILL BUILD, MODIFY, AND VERIFY A FINITE ELEMENT GEOMETRY. TWO PROCESSORS ARE PRESENT TO FORMAT INPUT DATA FOR MAGNUM.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: POSTPROCESSOR-MAGNUM

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): ED CRAFT, BWIP, (509) 376-5407
DAVE LANGFORD, BWIP, (509) 376-6175

REFERENCE: UNKNOWN

CODE NAME: MASSBAL 1.0

VARIANTS: NONE

CODE TYPE: NUCLIDE INVENTORY
GEOCHEMISTRY

DESCRIPTION: CALCULATES DISSOLUTION RATE OF A GLASS IN A SALT
REPOSITORY ENVIRONMENT.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): B.P. MCGRAIL
PNL
(509) 375-2015

REFERENCE: UNKNOWN

CODE NAME: MASSTRANS

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: FINITE ELEMENT TRANSPORT OF SINGLE RADIOACTIVE SPECIES WITH SORPTION.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: PREPROCESSOR - WATER MOVEMENT

EXTERNAL FILES: WATER MOVEMENT

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): G.E. BARR
SANDIA NATIONAL LABS
FTS 844-8532

REFERENCE: OAK RIDGE NATIONAL LABORATORIES (ORNL-4928)

CODE NAME: MGRID

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
SYSTEM MODELING

DESCRIPTION: STEADY STATE POROUS MEDIA FLOW USING MULTI-GRID SOLUTION
ALGORITHM. DESIGNED FOR FAST SOLUTION OF LARGE (ABOUT
250,000 NODE) PROBLEMS.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): S. GUPTA, ONWI, (614) 424-5074
W. CONKERE, PNL, FTS 444-9838

REFERENCE: UNKNOWN

CODE NAME: MICROSHIELD

VARIANTS: NONE

CODE TYPE: NUCLEAR RADIATION TRANSPORT
DOSE-TO-MAN

DESCRIPTION: SHIELDING CALCULATIONS - VERY EASY TO USE, MUCH REQUIRED
DATA IS BUILT IN. THIS IS A COMMERCIAL VERSION OF
ISOSHLD.

COMMENTS: NONE

COMPUTER(S): IBM

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): C.A. NEGIN
GROVE ENGINEERING, INC.
(301) 258-2727

REFERENCE: UNKNOWN

CODE NAME: MIDNITE

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: EVALUATES ANALYTICAL SOLUTIONS OF THE DIFFUSION EQUATION FOR POINT, FINITE LINE, INFINITE LINE OR INFINITE PLANE SOURCES IN AN INFINITE HOMOGENEOUS ISOTROPIC MEDIUM WITH ARBITRARY SOURCE POWER HISTORY.

COMMENTS: THE "PLUS FAMILY".

COMPUTER(S): MAINFRAME, CDC, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): D.N. MONTAN
LLNL
(415) 422-3941

REFERENCE: UNKNOWN

CODE NAME: MINC
VARIANTS: NONE
CODE TYPE: MAPPING
DESCRIPTION: GRIDDING PROGRAM FOR RANDOMLY-SPACED POTENTIAL FIELD
DATA USING THE METHOD OF MINIMUM CURVATURE.
COMMENTS: NONE
COMPUTER(S): VAX
INTERFACES: NONE
EXTERNAL FILES: NONE
ACQUISITION: YES, NONPROPRIETARY
RESPONDENT(S): MIKE WEBRING
USGS
(303) 236-1392
REFERENCE: UNKNOWN

CODE NAME: MODULI

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS

DESCRIPTION: CALCULATES ELASTIC MODULI OF ROCK CORES IN UNIAXIAL
COMPRESSION.

COMMENTS: NONE

COMPUTER(S): IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER, MTL
295-7848

REFERENCE: UNKNOWN

CODE NAME: MORSE

VARIANTS: MORSE-CG, MORSE-CGA, MORSE-SGC, MORSE-L

CODE TYPE: NUCLEAR RADIATION TRANSPORT
DOSE-TO-MAN

DESCRIPTION: MULTIDIMENSIONAL, MULTIGROUP MONTE CARLO CODE FOR
RADIATION SHIELDING ANALYSIS. CONTAINS MARS
COMBINATORIAL GEOMETRY SYSTEM TO ALLOW EASE IN MODELING
REPEATED ARRAY SYSTEMS. DESIGNED FOR SHIELDING/DOSE
ANALYSIS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, IBM, CDC

INTERFACES: PREPROCESSOR - NITAWL, XSDRWPM
SEE - COMMENTS

EXTERNAL FILES: MULTIGROUP CROSS-SECTION LIBRARY

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): J.S. TANG
ORNL
(615) 574-5266

THOMAS B. WILCOX, JR.
LLNL
(415) 422-6917

REFERENCE: M. B. EMMETT, "THE MORSE MONTE CARLO RADIATION TRANSPORT
CODE SYSTEM," ORNL-4972 (FEBRUARY 1975).

CODE NAME: MTFWD

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: FORWARD SOLUTION FOR 1-D (LAYERED EARTH). PLANE-WAVE
FREQUENCY SOUNDINGS.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DOUG KLEIN
USGS
(303) 236-1313

REFERENCE: UNKNOWN

CODE NAME: NE-UCB 00.00

VARIANTS: UCBNE 10.2, GETOUT

CODE TYPE: GEOSPHERE TRANSPORT
SYSTEM MODELING

DESCRIPTION: ACCEPTS TIME SERIES RADIONUCLIDE RELEASE INPUT DIRECTLY
FROM 3.00 WAPPA-C, COMPUTES RADIONUCLIDE TRANSPORT AND
DECAY OF ALL THE CONTENTS OF A WASTE PACKAGE THROUGH THE
GEOSPHERE, USING THE UCBNE 10.2 CODE AS A KERNEL.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: PREPROCESSOR - WAPPA-C 3.00

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): G. JANSEN
ONWI
(614) 424-7317

REFERENCE: UNKNOWN

CODE NAME: NETWORK
VARIANTS: NONE
CODE TYPE: THERMAL
DESCRIPTION: PRE-PROCESSOR FOR FINITE VOLUME CODES.
COMMENTS: NONE
COMPUTER(S): CRAY
INTERFACES: NONE
EXTERNAL FILES: NONE
ACQUISITION: NO, INCOMPLETE
RESPONDENT(S): J. L. SPURGEON
BWIP
(509) 376-9774
REFERENCE: UNKNOWN

CODE NAME: NIKE (2D/3D)

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS

DESCRIPTION: A VECTORIZED, IMPLICIT, FINITE DEFORMATION, FINITE ELEMENT CODE FOR ANALYZING THE STATIC AND DYNAMIC RESPONSE OF SOLIDS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: POSTPROCESSOR- ORION (2D), TAURUS (3D)
PREPROCESSOR - SLIC

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): JOHN HALLQUIST
LLNL
(415) 422-8756

DIANE CHINN
LLNL
(415) 422-8756

REFERENCE: J. O. HALLQUIST, NIKE2D - A VECTORIZED, IMPLICIT, FINITE DEFORMATION, FINITE ELEMENT CODE FOR ANALYZING THE STATIC AND DYNAMIC RESPONSE OF 2-D SOLIDS, UCID-19677, FEBRUARY 1983.

J. O. HALLQUIST, NIKE3D - A IMPLICIT, FINITE DEFORMATION, FINITE ELEMENT CODE FOR ANALYZING THE STATIC AND DYNAMIC RESPONSE OF 3-D SOLIDS, UCID-18822, REV. 1, JULY 1984.

CODE NAME: NITAWL-S

VARIANTS: NONE

CODE TYPE: NUCLEAR RADIATION TRANSPORT

DESCRIPTION: RESONANCE SELF-SHIELDING VIA NORDHEIM INTEGRAL TREATMENT.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, IBM, CRAY

INTERFACES: POSTPROCESSOR- KENO V:A., XSDRNPM

EXTERNAL FILES: SCALE SYSTEM MODULES, MULTIGROUP CROSS SECTION SET, AMEX MASTER FORMAT

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): L.M.PETRIE
ORNL
(615) 574-5259

REFERENCE: R. M. WESTFALL ET AL., "NITAWL-S: SCALE SYSTEM MODULE FOR PERFORMING RESONANCE SHIELDING AND WORKING LIBRARY PRODUCTION", NUREG/CR-0200, VOLUME 2, SECTION F1, ORNL/NUREG/CSD-2/V2, OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TN.

CODE NAME: NORIA

VARIANTS: NORIA2

CODE TYPE: GEOSPHERE TRANSPORT
THERMAL

DESCRIPTION: NORIA IS A FINITE ELEMENT PROGRAM WHICH SOLVES FOUR NONLINEAR PARABOLIC PARTIAL DIFFERENTIAL EQUATIONS SIMULTANEOUSLY. THE FOUR EQUATIONS DESCRIBE THE TRANSPORT OF WATER, WATER VAPOR, AIR AND ENERGY THROUGH PARTIALLY SATURATED POROUS MEDIA. THE GAS PHASE IS TAKEN TO BE IDEAL. THE NUMERICAL PROCEDURE USES THE STANDARD GALERKIN FINITE ELEMENT METHOD TO HANDLE SPATIAL DISCRETIZATION OF TWO DIMENSIONAL DOMAINS (PLANAR OR AXISYMMETRIC). TIME INTEGRATION IS PERFORMED BY A THIRD ORDER PREDICTOR CORRECTOR SCHEME THAT USES ERROR ESTIMATES TO AUTOMATICALLY ADJUST TIME STEP SIZE SO AS TO MAINTAIN UNIFORM LOCAL TIME TRUNCATION ERROR THROUGHOUT THE CALCULATION. MOST MATERIAL PROPERTIES, SUCH AS PERMEABILITY, CAN EITHER BE SET TO CONSTANT VALUES OR CAN BE DEFINED AS FUNCTIONS OF THE DEPENDENT OR INDEPENDENT VARIABLES BY USER SUPPLIED SUBROUTINES.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: POSTPROCESSOR- FEMTRAN

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): N.E. BIXLER
SANDIA NATIONAL LABS
FTS 844-6815

REFERENCE: UNKNOWN

CODE NAME: NPRM

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS

DESCRIPTION: CALCULATES NITROGEN PERMEABILITY THROUGH A MEDIUM, SUCH AS ROCK CORE OR SOIL SAMPLES. PROGRAM CONTAINS COMPLETE SET OF FLOWMETER CALIBRATION CURVES FOR DIGITIZING.

COMMENTS: NONE

COMPUTER(S): MAINFRAME

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER, MTL
295-7848

REFERENCE: API PROCEDURE RE-27

CODE NAME: ONEDANT

VARIANTS: NONE

CODE TYPE: NUCLEAR RADIATION TRANSPORT

DESCRIPTION: SOLVES ONE-DIMENSIONAL RADIATION TRANSPORT EQUATION (BOLTZMANN EQUATION) FOR NEUTRONS AND GAMMA RAYS IN CARTESIAN, CYLINDRICAL, OR SPHERICAL COORDINATES, BY FINITE-DIFFERENCE TECHNIQUES.

COMMENTS: NONE

COMPUTER(S): CRAY

INTERFACES: PREPROCESSOR - TRANSX-CTR

EXTERNAL FILES: MATS5, MATXS1, MATXS6, MATXS7, MATXS8

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.K. TERRY
BWIP/PERFORMANCE ASSESSMENT
(509)376-6992

REFERENCE: R. DOUGLAS O'DELL, FORREST W. BRINKLEY, JR., AND DUANE R. MARR, "USER'S MANUAL FOR ONEDANT: A CODE PACKAGE FOR ONE-DIMENSIONAL DIFFUSION-ACCELERATED, NEUTRAL-PARTICLE TRANSPORT," LA-9184-M (FEBRUARY 1982).

CODE NAME: PABLM 1.00

VARIANTS: NONE

CODE TYPE: DOSE-TO-MAN
BIOSPHERE TRANSPORT

DESCRIPTION: PABLM CALCULATES THE DOSE-TO-MAN FROM EXPOSURE THROUGH
AQUATIC TERRESTRIAL PATHWAYS. CONCENTRATIONS OF
RADIONUCLIDES IN FOOD STUFFS ARE CALCULATED FROM
SUPPLIED AIR DISPERSION FACTORS OR IRRIGATION RATES.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): J. J. MAYBERRY
ONWI
(614) 424-7753

REFERENCE: B. A. NAPIER, W. E. KENNEDY, JR., AND J. K. SOLDAT,
"PABLM - A COMPUTER PROGRAM TO CALCULATE ACCUMULATED
RADIATION DOSES FROM RADIONUCLIDES IN THE ENVIRONMENT,"
PNL-3209 (MARCH 1980).

CODE NAME: PAC LIFE 1.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
GEOCHEMISTRY

DESCRIPTION: CORROSION OF STEEL AND COPPER CONTAINERS.
PROBABILISTIC, 2-D CODE WITH CORROSION AS A BOUNDARY
CONDITION.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): JOHN G. WALTON
BASALT WASTE ISOLATION PROJECT
(509) 376-9339

REFERENCE: UNKNOWN

CODE NAME: PACSTAT 2.00

VARIANTS: NONE

CODE TYPE: RISK ASSESSMENT

DESCRIPTION: PACSTAT IS A SET OF DRIVER ROUTINES FOR THE GENERATION OF A MONTE CARLO SIMULATION. THE USER MUST SUPPLY A DETERMINISTIC MODEL SUBSTITUTE AND THE DEFINITION OF THE INPUT AND OUTPUT VARIABLES.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): DAVE LANGFORD
BASALT WASTE ISOLATION PROJECT
(509) 376-6175

REFERENCE: UNKNOWN

CODE NAME: PALO DURO GSM 1.0

VARIANTS: FFSM, GSM, PDGSM

CODE TYPE: SYSTEM MODELING
GEOSPHERE TRANSPORT

DESCRIPTION: PALO-DURO GSM (GEOLOGIC SYSTEM MODEL) DEVELOPED TO
ANALYZE GEOLOGIC EVENTS AND PROCESS IMPACT ON SALT
REPOSITORY.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): SUMANT GUPTA
ONWI
(614) 424-5074

REFERENCE: UNKNOWN

CODE NAME: PANDORA

VARIANTS: NONE

CODE TYPE: SYSTEM MODELING
GEOSPHERE TRANSPORT

DESCRIPTION: POST-CLOSURE PERFORMANCE ASSESSMENT OF A NUCLEAR WASTE
PACKAGE EMPLACED IN UNSATURATED ROCK MEDIA.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): DAVID A LAPP
LLNL
(415) 422-5125

REFERENCE: UNKNOWN

CODE NAME: PATH (2D/3D)

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
SYSTEM MODELING

DESCRIPTION: COMPUTATION OF FLUID FLOW PATHS AND TRAVEL TIMES USING
MAGNUM GENERATED FLOW FIELDS. PATHS IS A (2D/3D)
PRELIMINARY ANALYSIS TOOL TO DETERMINE THE MOVEMENT OF
WATER TRANSPORTED CONTAMINANTS ACCIDENTALLY RELEASED
FROM A WASTE STORAGE FACILITY. THE MODEL WAS PURPOSELY
DESIGNED TO PROVIDE A BALANCE BETWEEN MODELLING
SOPHISTICATION AND THE LIMITED DATA USUALLY AVAILABLE
FOR INITIAL EVALUATIONS OF SUBSURFACE CONTAMINATION
PROBLEMS. ACCORDINGLY, THE BASIS OF THE CODE IS AN
IDEALIZED ANALYTIC SOLUTION FOR THE GROUNDWATER
POTENTIAL DISTRIBUTION, PATHLINE DIFFERENTIAL EQUATIONS
ARE WRITTEN AND THEN NUMERICALLY SOLVED BY THE CODE TO
GIVE THE PATHS OF THE FLUID PARTICLES AND THEIR ADVANCE
WITH TIME TOWARD THE OUTFLOW BOUNDARY. THE MODEL TREATS
BOTH STEADY-STATE AND TRANSIENT SATURATED FLOW SYSTEMS.
WELLS MAY ALSO BE PRESENT. GEOCHEMICAL RETARDATION IS
CONSIDERED, BUT DISPERSION (AND RADIOACTIVE DECAY) IS
IGNORED.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: PREPROCESSOR - MAGNUM

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DAVE LANGFORD
BASALT WASTE ISOLATION PROJECT
(509) 376-6175

NIAL W. KLINE
BWIP
(509) 376-4634

REFERENCE: UNKNOWN

CODE NAME: PATRAN 1.6

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: ALLOWS GRAPHICALLY ENHANCED GENERATION OF FINITE ELEMENT AND FINITE DIFFERENCE MESHES. ALSO ALLOWS GRAPHIC INTERPRETATION OF IMPORTED NODAL VALUES. PATRAN DOES NOT PROVIDE ANY NUMERICAL SOLUTIONS.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: CODE WILL INTERFACE WITH A VARIETY OF FINITE ELEMENT MODELS

EXTERNAL FILES: NONE

ACQUISITION: YES, USAGE FEE REQUIRED

RESPONDENT(S): GREGORY L. UNDERBERG
BWIP
(509) 376-0765

REFERENCE: UNKNOWN

CODE NAME: PAVAN.1P

VARIANTS: NONE

CODE TYPE: AIR DISPERSION

DESCRIPTION: DISPERSION MODEL TO CALCULATE DESIGN BASIS ACCIDENT
CONDITION.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: MET. DATA & INF

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): MIKE SEPTOFF
NUS
(301) 258-6000

REFERENCE: T. J. BANDER, "PAVAN: AN ATMOSPHERIC DISPERSION PROGRAM
FOR EVALUATING DESIGN BASIS ACCIDENTAL RELEASES OF
RADIOACTIVE MATERIALS FROM NUCLEAR POWER STATIONS,"
NUREG/CR-2858 (NOVEMBER 1982).

CODE NAME: PAYMENTS EQUAL TO TAX (PETT)
VARIANTS: GRANTS EQUAL TO TAX (GETT)
CODE TYPE: TOTAL SYSTEM LIFE CYCLE COST
DESCRIPTION: CODE USED TO FORECAST STATE & LOCAL TAX LIABILITY OF DOE
RELATED TO REPOSITORY ACTIVITIES.
COMMENTS: NONE
COMPUTER(S): IBM COMPATIBLE
INTERFACES: NONE
EXTERNAL FILES: INPUT FILE
ACQUISITION: YES, NONPROPRIETARY
RESPONDENT(S): SUZANNE GRAY
ONWI
(614) 424-7706
REFERENCE: UNKNOWN

CODE NAME: PCM.STAT

VARIANTS: NONE

CODE TYPE: GEOCHEMISTRY

DESCRIPTION: USE EMPIRICAL CORRELATION OF CARBON STEEL CORROSION RATE
WITH TEMPERATURE TO PREDICT THE OVERALL CORROSION DEPTH.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): SHU-CHIEN YUNG
BWIP, ROCKWELL HANFORD
(509) 376-5373

REFERENCE: UNKNOWN

CODE NAME: PDGSM

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: PALO DURO GEOLOGIC SIMULATION MODEL. MONTE CARLO
SIMULATION OF GEOLOGIC EVENTS AND THEIR EFFECTS ON
GROUNDWATER TRAVEL TIMES FROM A PROPOSED REPOSITORY TO
THE ACCESSIBLE ENVIRONMENT.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): WILLIAM CONBERE
PNL
FTS 444-9838

REFERENCE: UNKNOWN

CODE NAME: PETROS 1.0 AND 1.1

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
THERMAL

DESCRIPTION: A 1-D COMPUTER CODE THAT COMPUTES THE TRANSPORT OF WATER, WATER VAPOR, AN INERT GAS, AND HEAT THROUGH PARTIALLY SATURATED POROUS MEDIUM. THE MASS FLUX OF LIQUID WATER IS DRIVEN BY GRADIENTS IN SATURATION, TEMPERATURE, AND GAS PRESSURE AS WELL AS THE FORCE OF GRAVITY. GAS TRANSPORT INCLUDES EFFECTS DUE TO KNUDSEN DIFFUSION AND BINARY GASEOUS DIFFUSION OF EACH GAS COMPONENT, PLUS DARCY FLOW OF THE GAS MIXTURE.

COMMENTS: NONE

COMPUTER(S): VAX, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): BRENDA LANGKOPF
SANDIA NATIONAL LABS
(505) 844-8777

REFERENCE: UNKNOWN

CODE NAME: PHREEQE 1.0

VARIANTS: NONE

CODE TYPE: GEOCHEMISTRY
SYSTEM MODELING

DESCRIPTION: PHREEQE MODELS GEOCHEMICAL REACTIONS. THE CODE IS BASED ON AN ION PAIRING AQUEOUS MODEL AND CAN CALCULATE pH, REDOX POTENTIAL AND MASS TRANSFER. THE COMPOSITION OF SOLUTIONS IN EQUILIBRIUM WITH MULTIPLE PHASES CAN ALSO BE CALCULATED. WITH RESPECT TO ELEMENTS AND AQUEOUS SPECIES INCLUDED IN THE PROGRAM'S DATA BASE, THE AQUEOUS MODEL (I.E., THE NATURE OF THE SOLUTION COMPONENTS) IS EXTERIOR TO THE CODE AND IS COMPLETELY USER-DEFINABLE. THE CODE CAN BE USED TO CALCULATE MASS TRANSFER RESULTING FROM: ADDITION OF REACTANTS TO A SOLUTION; MIXING OF TWO WATERS; AND TITRATING ONE SOLUTION WITH ANOTHER.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): P.L. CLOKE
SAIC
FTS 544-7000

REFERENCE: INTERA ENVIRONMENTAL CONSULTANTS, INC., PHREEQE: A GEOCHEMICAL SPECIATION AND MASS TRANSFER CODE SUITABLE FOR NUCLEAR WASTE PERFORMANCE ASSESSMENT, ONWI-435, APRIL 1983.

CODE NAME: PITS

VARIANTS: REVISION 0

CODE TYPE: ROCK MECHANICS

DESCRIPTION: SYSTEM PROCESSES AND KEEPS TRACK OF PROCESSES OF POTENTIAL FIELD GEOPHYSICAL DATA. POTENTIAL FIELDS INTERACTIVE TRACKING SYSTEM (PITS).

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: PREPROCESSOR - EDCON, GF2, GF3, ISM, MAGMA2, MAGMA3

EXTERNAL FILES: DATA FILES FOR USER DEFINED USUALLY FROM PREVIOUS PROCESSES

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): J.R. KUNX
ROCKWELL/BWIP/SITE DEPARTMENT
376-7930

REFERENCE: UNKNOWN

CODE NAME: PLUS FAMILY

VARIANTS: CELERY, DAYLITE, MIDNIGHT, STALKS, TWIGS

CODE TYPE: THERMAL

DESCRIPTION: EVALUATES ANALYTICAL SOLUTIONS OF THE DIFFUSION EQUATION FOR POINT, FINITE LINE, INFINITE LINE OR INFINITE PLANE SOURCES IN AN INFINITE HOMOGENEOUS ISOTROPIC MEDIUM WITH ARBITRARY SOURCE POWER HISTORY.

COMMENTS: THE PLUS FAMILY ALSO ENTERED INDIVIDUALLY.

COMPUTER(S): MAINFRAME, CDC, GRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): D.N. MONTAN
LLNL
(415) 422-3941

REFERENCE: UNKNOWN

CODE NAME: PNASPLT

VARIANTS: REVISION 0

CODE TYPE: ROCK MECHANICS

DESCRIPTION: DISPLAY ROUTINES TO GRAPHICALLY DISPLAY PALEOMAGNETIC DATA.

COMMENTS: NONE

COMPUTER(S): MAINFRAME

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): R.D. LANDON
BWIP
(509) 376-6258

REFERENCE: UNKNOWN

CODE NAME: POPULATION IN-MIGRATION MODEL

VARIANTS: NONE

CODE TYPE: OPERATIONS AND LOGISTICS

DESCRIPTION: MODEL PROJECTS POPULATION CHANGES DUE TO INFLUX OF
REPOSITORY WORKERS.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: INPUT FILE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): SUZANNE GRAY
ONWI
(614) 424-7706

REFERENCE: UNKNOWN

CODE NAME: PORFLO (2D/3D)

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
THERMAL
SYSTEM MODELING

DESCRIPTION: A THREE-DIMENSIONAL (OR TWO-DIMENSIONAL)
FINITE-DIFFERENCE CONTINUUM MODEL FOR FLUID FLOW, HEAT
TRANSFER, AND MASS TRANSPORT IN POROUS MEDIA.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): CLYDE BROMLEY
BASALT WASTE ISOLATION PROJECT
(509) 376-3967

REFERENCE: UNKNOWN

CODE NAME: PORMC-SF (2D/3D)

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: TWO (OR THREE) DIMENSIONAL GROUNDWATER FLOW EQUATION
SOLVED WITH INTEGRATED FINITE DIFFERENCES, AND
CALCULATES GROUNDWATER TRAVEL TIMES.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: POSTPROCESSOR- TPLOT
PREPROCESSOR - RANGEN

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): P.M. CLIFTON
BASALT WASTE ISOLATION PROJECT
(509) 376-5722

REFERENCE: UNKNOWN

CODE NAME: POROS

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
GEOSPHERE TRANSPORT

DESCRIPTION: CALCULATES APPARENT PERCENT POROSITY FROM LABORATORY MEASUREMENTS TO INCLUDE BULK AND SOLID VOLUME, DENSITY OF AIR, ABSOLUTE AND APPARENT DENSITIES OF WATER.

COMMENTS: NONE

COMPUTER(S): MAINFRAME

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER
296-7848

REFERENCE: API PROCEDURE RP-40

CODE NAME: PRICKETTE & LONNQUIST BULL. #55

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: SIMULATES 1-, 2-, 3-DIMENSIONAL NONSTEADY FLOW OF
GROUNDWATER IN HETEROGENEOUS AQUIFERS UNDER THE WATER
TABLE, LEAKY AND NONLEAKY ARTESION CONDITIONS.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): GARY JELICK
NUS CORPORATION
(301) 258-8650

REFERENCE: UNKNOWN

CODE NAME: PRO

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: PROCESSING OF FREQUENCY-DOMAIN DATA TO MT IMPEDANCE
PARAMETERS.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): DOUG KLEIN
USGS
(303) 236-1313

REFERENCE: UNKNOWN

CODE NAME: PT/PTC (2D/3D)

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
MECHANICAL STRESS
THERMAL

DESCRIPTION: PT NUMERICALLY SOLVES THE 3D MASS AND ENERGY TRANSPORT EQUATIONS FOR A LIQUID-SATURATED POROUS MEDIUM, AND USES THE 1D CONSOLIDATION THEORY OF TERZAGHI TO CALCULATE THE DEFORMATION OF THE MEDIUM. THE METHOD OF SOLUTION IS BASED ON THE INTEGRATED FINITE DIFFERENCE METHOD. THE RESULTING SETS OF EQUATIONS ARE SOLVED BY DIRECT MEANS USING AN EFFICIENT SPARSE SOLVER. THE CODE WAS DEVELOPED FROM AN OLDER PROGRAM CCC, BUT USES MORE POWERFUL MATHEMATICAL AND NUMERICAL TECHNIQUES. IN COMPARISON TO CCC, PT IS 10 TO 100 TIMES MORE EFFICIENT FOR MOST PROBLEMS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CDC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): CHENG-HSIEN LAI
BERKELEY HYDROTECHNIQUE, INC.
(415) 549-9570

REFERENCE: UNKNOWN

CODE NAME: PTDIS.1P

VARIANTS: NONE

CODE TYPE: AIR DISPERSION

DESCRIPTION: CALCULATE SHORT TERM CONCENTRATIONS AT USER SPECIFIED DISTANCES.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: SOURCE TERM INFORMATION, MET. DATA

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): MIKE SEPTOFF
NUS
(301) 258-6000

REFERENCE: UNKNOWN

CODE NAME: PTPLU.1P
VARIANTS: NONE
CODE TYPE: AIR DISPERSION
DESCRIPTION: CALCULATE SHORT TERM 1 HOUR DISPERSION ESTIMATES.
COMMENTS: NONE
COMPUTER(S): MINI
INTERFACES: NONE
EXTERNAL FILES: SOURCE TERM INF
ACQUISITION: YES, NONPROPRIETARY
RESPONDENT(S): MIKE SEPTOFF
NUS
(301) 258-6000
REFERENCE: UNKNOWN

CODE NAME: PTRACK 0.0
VARIANTS: NONE
CODE TYPE: GEOSPHERE TRANSPORT
DESCRIPTION: PARTICLE TRACKING HYDROLOGY CODE.
COMMENTS: NONE
COMPUTER(S): UNKNOWN
INTERFACES: NONE
EXTERNAL FILES: NONE
ACQUISITION: YES, NONPROPRIETARY
RESPONDENT(S): W. HARPER
ONWI
(614) 424-5099
REFERENCE: UNKNOWN

CODE NAME: PTXXX SERIES MODEL 5

VARIANTS: NONE

CODE TYPE: AIR DISPERSION

DESCRIPTION: PROGRAM IS USED FOR STEADY STATE GAUSSIAN PLUME POINT SOURCE MODELS. PTMAX, PTDIS, PTMTP, PTPLU ARE INCLUDED WITHIN THIS PROGRAM.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): JOEL REISSMAN
BECHTEL NATIONAL, INC.
(415) 768-2526

REFERENCE: UNKNOWN

CODE NAME: PUMP

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: FINITE DIFFERENCE CODE FOR REDUCTION OF WELL-TESTS
(PUMP, SLUG, RECOVERY) IN A POROUS MEDIUM.

COMMENTS: ORIGINATOR OF EARLY VERSION - RUSHTON & REDSHAW -
SEEPAGE AND GROUNDWATER FLOW.

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): G.E. BARR
SANDIA NATIONAL LABS
FTS 844-8532

REFERENCE: UNKNOWN

CODE NAME: QAD-CG

VARIANTS: NONE

CODE TYPE: NUCLEAR RADIATION TRANSPORT
DOSE-TO-MAN

DESCRIPTION: A POINT-KERNEL CODE TO CALCULATE GAMMA-RAY SHIELDING
REQUIREMENTS, USING COMBINATIONAL GEOMETRY IN THREE
DIMENSIONS.

COMMENTS: NONE

COMPUTER(S): CDC, UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): MARILYN CASE/MARK D. OTIS
EG&G IDAHO, INC.
(208) 526-1678

URBAN JENQUIN
BATTELLE-NORTHWEST
(509) 376-4119

REFERENCE: V. R. CAIN, "A USERS MANUAL FOR QAD-CG, THE
COMBINATORIAL GEOMETRY VERSION OF THE QAD-P5A POINT
KERNEL SHIELDING CODE," NE007 (JULY 1977).

CODE NAME: RADIOL 1

VARIANTS: NONE

CODE TYPE: NUCLIDE INVENTORY

DESCRIPTION: CALCULATES CONCENTRATIONS OF RADIOLYTICALLY PRODUCED SPECIES IN THE VICINITY OF A NUCLEAR WASTE PACKAGE - ACCOUNTS FOR GAMMA RADIOLYSIS.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: POSTPROCESSOR- LSODE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): LARRY MORGAN
PNL
(509) 375-3874

REFERENCE: UNKNOWN

CODE NAME: RADRISK

VARIANTS: NONE

CODE TYPE: DOSE-TO-MAN

DESCRIPTION: EPA HEALTH EFFECT CODE (NON-CODIFIED VERSION OF CLEAN AIR ACT CODE).

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: PREPROCESSOR - AIRDOS-EPA

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): S. WOOLFOLK
SAIC
FTS 575-1825

REFERENCE: D. E. DUNNING, JR., R. W. LEGGETT, AND M. G. YALCINTAS,
"A COMBINED METHODOLOGY FOR ESTIMATING DOSE RATES AND
HEALTH EFFECTS FROM EXPOSURE TO RADIOACTIVE POLLUTANTS,"
ORNL/TM-7745 (1981).

CODE NAME: RADTRAN III

VARIANTS: INTERTRAN, RADTRAN I, RADTRAN II

CODE TYPE: RISK ASSESSMENT
TRANSPORTATION
NUCLIDE INVENTORY

DESCRIPTION: RADTRAN III CALCULATES EXPECTED RADIOLOGICAL RISKS OF RADIOACTIVE MATERIAL TRANSPORT; METEOROLOGICAL, DEMOGRAPHIC, HEALTH PHYSICS, TRANSPORTATION MODE AND ROUTE, PACKAGING AND MATERIAL FACTORS DATA ARE INCLUDED IN THE INPUT DATA AND ACCOUNTED FOR IN THE MODELS EMBODIED IN THE CODE.

COMMENTS: AVAILABLE THROUGH NATIONAL ENERGY SOFTWARE CTR., ANL

COMPUTER(S): MAINFRAME, IBM, VAX, CDC, CRAY

INTERFACES: POSTPROCESSOR- RADCOM
PREPROCESSOR - RADDAT

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): MARK D. OTIS ROBERT E. LUNA
EG&G IDAHO, INC. SANDIA NATIONAL LABORATORIES
(208)526-0603 (505) 844-8246

S. WOOLFOLK
SAIC
(702)295-1204

REFERENCE: M. MADSEN, J. M. TAYLOR, R. M. OSTMEYER, AND P. C. REARDON, "RADTRAN III," SAND 84-0036, FEBRUARY 1986.

CODE NAME: RAECOM

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: NRC LICENSING CODE FOR RADON DIFFUSION MODELING.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): S. WOOLFOLK
SAIC
(702) 295-1204

REFERENCE: (NUREG/CR-3533), NUREG/CR-3533

CODE NAME: RANGEN
VARIANTS: NONE
CODE TYPE: SYSTEM MODELING
DESCRIPTION: RANDOM FIELD GENERATOR.
COMMENTS: NONE
COMPUTER(S): MINI
INTERFACES: POSTPROCESSOR- PORMC-SF
PREPROCESSOR - KRIGE
EXTERNAL FILES: NONE
ACQUISITION: NO, INCOMPLETE
RESPONDENT(S): P.M. CLIFTON
BASALT WASTE ISOLATION PROJECT
(509) 376-5722
REFERENCE: UNKNOWN

CODE NAME: RECON 2.0

VARIANTS: NONE

CODE TYPE: TOTAL SYSTEM LIFE CYCLE COST
OPERATIONS AND LOGISTICS

DESCRIPTION: THIS CODE IS USED TO ESTIMATE REPOSITORY COSTS FOR
PARAMETRIC REPOSITORY OPERATING EVALUATIONS USING
DIFFERENT OPERATING PERIMETERS, REPOSITORY MEDIA, AND
WASTE TYPES.

COMMENTS: NONE

COMPUTER(S): UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): LAVELLE CLARK
PNL
(509) 376-3846

REFERENCE: L. L. CLARK ET AL., "RECON: A COMPUTER PROGRAM FOR
ANALYZING REPOSITORY ECONOMICS, PNL-4465, 1983, PACIFIC
NORTHWEST LABORATORY, RICHLAND, WA.

CODE NAME: REELCAP

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: CALCULATES THE AMOUNT OF CABLE THAT CAN BE PUT ON A
DESIGNED REEL GIVEN THE CABLE DIAMETER.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): BERNE GEBS
HOLMES AND NARVER
295-6507

REFERENCE: UNKNOWN

CODE NAME: REPREL 2.0

VARIANTS: NONE

CODE TYPE: RISK ASSESSMENT
SYSTEM MODELING

DESCRIPTION: COMBINES STOCHASTIC CONTAINER FAILURE TIMES AND
STOCHASTIC RELEASES FROM A SINGLE CONTAINER TO COMPUTE
THE EXPECTED VALUE AND VARIANCE OF THE FRACTIONAL MASS
RELEASE RATE AND TOTAL RELEASE FROM A SERIES OF
CONTAINERS FAILING AT SEPARATE TIMES.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: PREPROCESSOR - CHAINT.MC, PCM.STAT

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): PAUL W. ESLINGER
BASALT WASTE ISOLATION PROJECT
(509) 376-3442

REFERENCE: UNKNOWN

CODE NAME: ROCKMASS

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
THERMAL
GEOSPHERE TRANSPORT

DESCRIPTION: ANALYSIS OF COUPLED THERMAL-HYDRAULIC-MECHANICAL
PHENOMENA IN SATURATED FRACTURED POROUS MEDIA. THE
NUMERICAL METHOD EMPLOYED IN THE CODE IS GALERKIN
FINITE-ELEMENT METHOD.

COMMENTS: NONE

COMPUTER(S): CDC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): CHENG-HSIEN LAI
BERKELEY HYDROTECHNIQUE, INC.
(415) 549-9570

REFERENCE: UNKNOWN

CODE NAME: SAGUARO

VARIANTS: MARIAH

CODE TYPE: GEOSPHERE TRANSPORT
THERMAL

DESCRIPTION: SAGUARO IS A FINITE ELEMENT CODE DEVELOPED TO SOLVE 2D, TIME DEPENDENT PROBLEMS OF INCOMPRESSIBLE SINGLE PHASE WATER AND ENERGY TRANSPORT THROUGH POROUS MEDIA WHICH MAY BE PARTIALLY OR FULLY SATURATED. THE TWO TRANSPORT EQUATIONS (MASS AND ENERGY), WHICH MODEL THE FLOW INCORPORATE DARCY'S LAW, THE BOUSSINESQ APPROXIMATION, THE SORET EFFECT, CONDUCTION AND CONVECTION. THE RESULTING NON LINEAR PARABOLIC EQUATIONS ARE SOLVED IN FINITE ELEMENT FORM USING AN ALGORITHM RELATED TO THE STANDARD CRANK- NICOLSON METHOD. THE MATRIX SOLUTION PROCEDURE IS A FORM OF GAUSSIAN ELIMINATION. PROGRAM OUTPUT INCLUDES THE VARIATION OF HYDRAULIC HEAD, TEMPERATURE, VELOCITY AND MOISTURE CONTENT WITH TIME AND POSITION. OUTPUT PRESSURE OF VELOCITY FIELDS CAN BE COUPLED TO THE RADIONUCLIDE TRANSPORT CODE FEMTRAN. SAGUARO IS A DIRECT DEVELOPMENT OF THE CODE MARIAH WHICH SOLVES THE FLOW AND HEAT TRANSFER EQUATIONS FOR A FULLY SATURATED MEDIUM.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: POSTPROCESSOR- FEMTRAN

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): R.R. EATON
SANDIA NATIONAL LABS
FTS 844-4063

REFERENCE: UNKNOWN

CODE NAME: SANCHO

VARIANTS: HONDO

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS

DESCRIPTION: SANCHO IS A MODIFICATION OF THE TRANSIENT DYNAMIC CODE, HONDO, WHICH CAN TREAT TWO-DIMENSIONAL FINITE STRAIN, THERMOELASTICITY, MOHR-COULOMB FAILURE, AND THERMOELASTIC CREEP PROBLEMS. ELASTIC-PLASTIC MODES, INCLUDING COMPACTION, PRESSURE-DEPENDENT YIELD, AND TENSILE FAILURES, CAN ALL BE CONSIDERED. THE CODE CAN TREAT RELATIVE MOTION ALONG SLIP LAYERS. CLOSURE OF EVACUATIONS AND RESULTING CONTACT BETWEEN WALLS AND FLOOR AND CEILING CAN ALL BE TREATED. JOINTING IS NOT MODELED. THE SOLUTION TECHNIQUE TESTS IN EQUILIBRIUM RATHER THAN STRESS OR STRAIN INCREMENT TO DETECT CONVERGENCE. DYNAMIC RELAXATION IS USED TO CONTROL THE LOAD STEPS SO THAT THE CODE, ALTHOUGH COSTLY, IS VERY RELIABLE.

COMMENTS: NONE

COMPUTER(S): VAX, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): C.M. STONE
SANDIA NATIONAL LABS
(505) 844-5113

REFERENCE: CHARLES M. STONE, RAYMOND D. KRIEG, AND ZELMA E. BEISINGER, SANCHO: A FINITE ELEMENT COMPUTER PROGRAM FOR THE QUASISTATIC, LARGE DEFORMATION, INELASTIC RESPONSE OF TWO-DIMENSIONAL SOLIDS, SAND84-2618, APRIL 1985.

CODE NAME: SCALE COMPUTATIONAL SYSTEM

VARIANTS: NONE

CODE TYPE: NUCLEAR RADIATION TRANSPORT
THERMAL
RISK ASSESSMENT

DESCRIPTION: MODULAR CODE SYSTEM FOR "AUTOMATED" CRITICALITY SAFETY,
SHIELDING, AND HEAT TRANSFER ANALYSIS OF SPENT FUEL
TRANSPORT ON STORAGE CASKS. HOWEVER, ONLY A FEW OF THE
SEQUENCES ARE RESTRICTED TO CASK APPLICATIONS. CONTENTS
INCLUDE BONAMI-S, NITAWL-S, XSDRNPM-S, XSDOSE, KENO
V.A., MORSE-SGC, COUPLE, ORIGEN-S, HEATING6.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, IBM, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): C.V. PARKS
ORNL
(615) 574-5280

REFERENCE: "SCALE: A MODULAR CODE SYSTEM FOR PERFORMING
STANDARDIZED COMPUTER ANALYSES FOR LICENSING
EVALUATION," NUREG/CR-0200 (ORNL/NUREG/CSD-2) VOLS. I,
II, AND III (JANUARY 1982). UPDATES AND REVISIONS
PUBLISHED JUNE 1983 TO UPDATE TO SCALE-2 VERSION.
UPDATES AND REVISIONS PUBLISHED DECEMBER 1984 TO UPDATE
SCALE-2 TO SCALE-3.

CODE NAME: SCOPE

VARIANTS: NONE

CODE TYPE: NUCLEAR RADIATION TRANSPORT
THERMAL
TRANSPORTATION

DESCRIPTION: SHIPPING CASK OPTIMIZATION AND EVALUATION CODE;
CALCULATES SIZE, WEIGHT, AND CAPACITY OF CASKS GIVEN THE
NECESSARY SHIELD THICKNESSES. ALSO CALCULATES INTERNAL
AND EXTERNAL TEMPERATURES UNDER STEADY STATE CONDITIONS,
AND DURING AND AFTER HALF HOUR FIRE. MANUAL INCLUDES
RESULTS OF EXTENSIVE SHIELDING OPTIMIZATION STUDIES.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, IBM

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): J.A. BUCHOLZ
ORNL
(615) 574-5253

REFERENCE: J. A. BUCHOLZ, "SCOPE-SHIPPING CASK OPTIMIZATION CODE
SYSTEM", OAK RIDGE NATIONAL LABORATORY, RADIATION
SHIELDING INFORMATION CENTER, PSR-210.

CODE NAME: SCOPE 1

VARIANTS: NONE

CODE TYPE: BIOSPHERE TRANSPORT
DOSE-TO-MAN
GEOSPHERE TRANSPORT

DESCRIPTION: ENVIRONMENTAL PATHWAYS MODEL, TO PREDICT THE TRANSPORT
OF RADIONUCLIDES FROM BURIED WASTE TO VARIOUS SOIL AND
BIOTIC COMPARTMENTS. OUTPUT OF THE SCOPE CODE IS USED
WITH AIRDOS AND QAD/FN TO ESTIMATE DOSE TO VARIOUS
RECEPTORS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CDC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): MARILYN CASE
EG&G IDAHO, INC.
(208) 526-1678

REFERENCE: UNKNOWN

CODE NAME: SCOPE 2.0

VARIANTS: NONE

CODE TYPE: BIOSPHERE TRANSPORT
DOSE-TO-MAN
GEOSPHERE TRANSPORT

DESCRIPTION: SCOPE 2.0 IS A DAISY CHAIN OF LINKED MODES FROM ARES1,
THROUGH IASSY CODES TO ONE OF SEVERAL OUTPUTS INCLUDING
EXPOSE, DITTY, ALDOS, PABLM TO YIELD RELEASE AS A
FUNCTION OF TIME BY RADIONUCLIDE DOSE-TO-MAN IN SEVERAL
FORMATS, OR INTEGRATED RELEASE ACCORDING TO SOME
CRITERION.

COMMENTS: NONE

COMPUTER(S): NONE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): M.A. GLENNON
PACIFIC NORTHWEST LABORATORY
(509) 376-5831

REFERENCE: UNKNOWN

CODE NAME: SEARS - SOCIOECONOMIC ANALYSIS

VARIANTS: NONE

CODE TYPE: OPERATIONS AND LOGISTICS

DESCRIPTION: CODE PROJECTS DEMOGRAPHIC, ECONOMIC, FISCAL AND
COMMUNITY SERVICE CHANGES AND REQUIREMENTS IN THE
VICINITY OF THE REPOSITORY.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, IBM

INTERFACES: NONE

EXTERNAL FILES: INPUT FILE, USER GENERATED

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): SUZANNE GRAY
ONWI
(614) 424-7706

REFERENCE: UNKNOWN

CODE NAME: SILLY

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: RECONSTRUCTION AND IMAGE DISPLAY FOR COMPUTED IMPEDANCE TOMOGRAPHY - USES BACK PROJECTION TECHNIQUES.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): WILLIAM DAILY, L-156
LLNL
(415) 422-8623

REFERENCE: UNKNOWN

CODE NAME: SIM

VARIANTS: SUPER7

CODE TYPE: THERMAL

DESCRIPTION: ANALYTIC SOLUTION FOR SUPERPOSITION OF DECAY LINE HEAT SOURCES.

COMMENTS: GOOD FOR DESIGN STUDIES.

COMPUTER(S): IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): AHMAD BADLE
PARSONS BRINCKERHOFF
(415) 474-4500

REFERENCE: UNKNOWN

CODE NAME: SIMMINE 1.0

VARIANTS: NONE

CODE TYPE: SYSTEM MODELING
OPERATIONS AND LOGISTICS

DESCRIPTION: SIMMINE IS A SUBSURFACE SIMULATION MODEL. SIMMINE
SIMULATES THE MINING OF A GEOLOGICAL HIGH-LEVEL NUCLEAR
WASTE REPOSITORY IN A SALT MEDIUM.

COMMENTS: WILL BE AVAILABLE UPON COMPLETION OF VERIFICATION AND
DOCUMENTATION.

COMPUTER(S): MAINFRAME, PERSONAL COMPUTER, IBM, IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): J. FURR
ONWI
(614) 424-7283

REFERENCE: UNKNOWN

CODE NAME: SIMREP 1.1

VARIANTS: NONE

CODE TYPE: SYSTEM MODELING
OPERATIONS AND LOGISTICS

DESCRIPTION: SIMULATION OF REPOSITORY SURFACE OPERATIONS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, PERSONAL COMPUTER, IBM, IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): P. S. TARAPORE
ONWI
(614) 424-4700

REFERENCE: UNKNOWN

CODE NAME: SINDA

VARIANTS: NONE

CODE TYPE: THERMAL
SYSTEM MODELING

DESCRIPTION: SINDA ORIGINALLY NAMED CINDA3G, IS INTENDED PRIMARILY FOR HEAT TRANSFER ANALYSIS OF SYSTEMS REPRESENTED IN ELECTRICAL ANALOG, LUMPED PARAMETER FORM. ITS USE CAN BE EXTENDED TO INCLUDE OTHER CLASSES OF PHYSICAL SYSTEMS WHICH CAN BE MODELED IN THIS FORM. SINDA CAN ADDRESS STEADY-STATE OR TRANSIENT HEAT TRANSFER PROBLEMS DEFINED IN ESSENTIALLY ANY GEOMETRY SYSTEM. THE THERMAL CONDUCTANCE, THERMAL CAPACITANCE, AND SOURCE TERMS MAY BE SPACE-, TEMPERATURE-, AND/OR TIME-DEPENDENT. THE HEAT TRANSFER MODEL MAY INCLUDE CHANGE-OF-STATE AND MASS FLOW CALCULATIONS. BOUNDARY CONDITIONS INCLUDE PRESCRIBED TEMPERATURE, FORCED AND NATURAL CONVECTION, RADIATION, AND PRESCRIBED HEAT FLUX. THE SINDA LIBRARY CONTAINS A LARGE ASSORTMENT OF SUB-ROUTINES WHICH SOLVE THE THERMAL NETWORK USING DIFFERENT METHODS. STEADY-STATE TECHNIQUES INCLUDE BLOCK ITERATION, SUCCESSIVE POINT ITERATION WITH EXTRAPOLATION, AND AN ACCELERATED SUCCESSIVE POINT ITERATION METHOD FOR RADIATION-DOMINATED PROBLEMS. EACH OF THESE TECHNIQUES CAN EMPLOY RELAXATION. TRANSIENT TECHNIQUES INCLUDE THE EXPLICIT FORWARD-DIFFERENCING METHOD WITH VARIATIONS, THE EXPLICIT EXPONENTIAL PREDICTION METHOD, THE DUFORT-FRENKEL EXPLICIT METHOD, AND AN IMPLICIT METHOD THAT RANGES BETWEEN CRANK-NICHOLSON AND FULLY IMPLICIT.

COMMENTS: MESH GENERATION.

COMPUTER(S): MAINFRAME, VAX, CDC, CRAY

INTERFACES: PRE/POSTPROCESSOR- PATRAN

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): CHIN-HUA (CHESTER) HUANG
BASALT WASTE ISOLATION PROJECT

REFERENCE: UNKNOWN

CODE NAME: SOCON-5 1.00

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: CODE CALCULATES SOUND LEVEL CONTRIBUTIONS AT DESIGNATED
OUTDOOR SOUND RECEPTORS. INPUTS ARE LOCATION
COORDINATES OF SOURCES AND RECEIVERS, SOUND POWER LEVELS
OF SOURCES, BACKGROUND LEVEL AT RECEIVERS, ATTENUATION
FACTORS, AND APPLICABLE DIRECTIONAL RADIATION FACTORS
FOR SOURCES.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: USER GENERATED

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ROBERT WERTH
NUS CORPORATION
(301) 258-8752

REFERENCE: UNKNOWN

CODE NAME: SOURCE2

VARIANTS: REV 2, DECEMBER 1986

CODE TYPE: NUCLEAR RADIATION TRANSPORT
NUCLIDE INVENTORY

DESCRIPTION: SOURCE2 CALCULATES, AT A SPECIFIED DECAY TIME THE AMOUNT
OF RADIOACTIVITY DUE TO EACH ISOTOPE OF A COMPLEX
MULTIPLE DECAY CHAIN. IT ALSO CALCULATES THE
ACCUMULATION AND DECAY OF AN INPUT FLOW OF ISOTOPES AND
THEIR DECAY PRODUCTS FOR A SPECIFIED ACCUMULATION TIME.

COMMENTS: NONE

COMPUTER(S): UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): D.T. DEXHEIMER
BECHTEL WESTERN POWER CORP.
(415) 768-1234

REFERENCE: UNKNOWN

CODE NAME: SPAM 1.0

VARIANTS: NONE

CODE TYPE: SYSTEM MODELING
GEOSPHERE TRANSPORT

DESCRIPTION: SYSTEMS PERFORMANCE ASSESSMENT MODEL.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CDC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): PAUL W. ESLINGER
BASALT WASTE ISOLATION PROJECT
(509) 376-3442

REFERENCE: UNKNOWN

CODE NAME: SPARTAN

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
SYSTEM MODELING

DESCRIPTION: SPARTAN IS A SIMPLE COMPUTER MODEL TO CALCULATE
GROUNDWATER TRAVEL TIME AND RADIONUCLIDE TRANSPORT FOR
NNWSI DRAFT EA. THE PHYSICAL PROCESS CONSIDERED ARE
LIMITED TO DARCY'S FLOW, CONVECTIVE TRANSPORT WITH
RETARDATION AND RADIONUCLIDE DECAY.

COMMENTS: NONE

COMPUTER(S): CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): Y.T. LIN
SANDIA NATIONAL LABS
FTS 846-1816

REFERENCE: UNKNOWN

CODE NAME: SPECTROM 21

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS
ROCK MECHANICS

DESCRIPTION: SPECTROM 21, FORMERLY KNOWN AS TEVCO, IS A 2-DIMENSIONAL QUASISTATIC FINITE-ELEMENT CODE FOR MECHANICAL ANALYSES. IT TREATS ELASTIC AND VISCOUS PROBLEMS (CREEP). IT IS A PREDECESSOR OF SPECTROM 11 AND DOES NOT HAVE THE CAPABILITY TO TREAT PLASTICITY OF YIELDING. FOR THERMALLY INDUCED STRESSES, THE CODE REQUIRES TEMPERATURES FROM SUPPORTING CALCULATIONS.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: PREPROCESSOR - SPECTROM 41

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): E.G. MCNULTY
ONWI
(614) 424-5334

REFERENCE: UNKNOWN

CODE NAME: SPECTROM-31

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS
ROCK MECHANICS

DESCRIPTION: FINITE ELEMENT METHOD CODE DESIGNED TO CALCULATE THE
LARGE DEFORMATION ELASTIC AND INELASTIC STATIC AND
QUASISTATIC RESPONSE OF 2-DIMENSIONAL SOLIDS (PLAIN
STRAIN, PLAIN STRESS, AND AXISYMMETRIC). EIGHT-NODE
ISOPARAMETRIC ELEMENT USED. THE PROGRAM SOLVES FOR
EQUILIBRIUM USING A MODIFIED NEWTON-RAPHSON ITERATION
COMPILED TO A CONSTANT ARC LENGTH PROCEDURE. 6 MATERIAL
MODELS INCLUDE ELASTIC, VISCOELASTIC- PLASTIC, CRUSHABLE
FOAM, SOIL, CREEP, AND ROCK MASS RESPONSES.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): SAMUEL W. KEY
RE/SPEC INC.
(505) 293-2000

REFERENCE: UNKNOWN

CODE NAME: SPECTROM-31 SPECIAL PURPOSE

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS
ROCK MECHANICS

DESCRIPTION: FINITE ELEMENT PLANE STRAIN/AXISYMMETRIC, QUASISTATIC,
INELASTIC RESPONSE OF SOLIDS.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: POSTPROCESSOR- SPECTROM 31

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): SAM KEY
RE/SPEC, INC.
(505) 243-2000

REFERENCE: UNKNOWN

CODE NAME: SPECTROM-32

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS

DESCRIPTION: FINITE ELEMENT PROGRAM FOR TWO-DIMENSIONAL AND
AXISYMMETRIC INELASTIC THERMOMECHANICAL PROBLEMS.
PROGRAM WAS DEVELOPED SPECIFICALLY FOR PROBLEMS RELATED
TO GEOLOGICAL NUCLEAR WASTE DISPOSAL.

COMMENTS: NONE

COMPUTER(S): MINI VAX

INTERFACES: POSTPROCESSOR- ALGEBRA, DETOUR, SPLOT, TPLOT
PREPROCESSOR - GEOMESH, SPECTROM -41

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DR. ARLO F. FOSSUM
RE/SPEC, INC.
(605) 394-6400

E.G. MCNULTY
ONWI
(614) 424-5334

REFERENCE: UNKNOWN

CODE NAME: SPECTROM-349

VARIANTS: NONE

CODE TYPE: THERMAL
ROCK MECHANICS

DESCRIPTION: SPECTROM-349 IS A THREE DIMENSIONAL LINEAR SUPERPOSITION
HEAT CONDUCTION PROGRAM. ANALYTICAL SOLUTIONS FOR A
HEATED PLATE IN A SEMI-FINITE MEDIUM ARE SUPERPOSED TO
OBTAIN APPROXIMATE SOLUTIONS TO THE HEAT TRANSFER FROM A
REPOSITORY TO THE FAR FIELD HOST RACK. HEAT SOURCE IS
SUM OF EXPONENTIALLY DECAYING TERMS.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DARRELL SVALSTAD/MARK BLANFORD
RE/SPEC
(505) 293-2000

REFERENCE: UNKNOWN

CODE NAME: SPECTROM-349 SPECIAL PURPOSE

VARIANTS: NONE

CODE TYPE: THERMAL
ROCK MECHANICS

DESCRIPTION: 3-D ANALYTIC HALF SPACE HEAT CONDUCTION CODE WITH
EXPONENTIALLY DECAYING RECTANGULAR HEAT SOURCES.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: POSTPROCESSOR- SPECTROM 31

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): MARK BLANFORD
RE/SPEC, INC
(505) 243-2000

REFERENCE: UNKNOWN

CODE NAME: SPECTROM 41

VARIANTS: NONE

CODE TYPE: THERMAL
ROCK MECHANICS

DESCRIPTION: SPECTROM 41 IS A FINITE ELEMENT PROGRAM FOR THE ANALYSIS OF TWO-DIMENSIONAL AND AXISYMMETRIC CONDUCTIVE HEAT TRANSFER. THE PROGRAM WAS DEVELOPED SPECIFICALLY TO ADDRESS THERMAL PROBLEMS RELATED TO THE DISPOSAL OF NUCLEAR WASTE.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: POSTPROCESSOR- ALGEBRA, DETOUR, SPECTROM 32,
SPECTROM 31, SPECTROM 58, SPLOT,
TPLOT.
PREPROCESSOR- GEOMESH

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DARRELL K. SVALSTAD E.G. MCNULTY
RE/SPEC INC. ONWI
(605) 394-6400 (614) 424-5334

REFERENCE: UNKNOWN

CODE NAME: SPECTROM-41 SPECIAL PURPOSE

VARIANTS: NONE

CODE TYPE: THERMAL
ROCK MECHANICS

DESCRIPTION: SPECTROM 41 IS A FINITE ELEMENT PLANAR/AXISYMMETRIC TRANSIENT HEAT TRANSFER CODE WITH TEMPERATURE DEPENDENT PROPERTIES. THE CODE WAS FORMERLY KNOWN AS RSI/TRANCO AND HAS BEEN USED TO ANALYZE THE TEMPERATURES IN A REPOSITORY DUE TO THE EMPLACEMENT OF RADIOACTIVE WASTE CANISTERS. THE MODEL ALLOWS TIME-DEPENDENT BOUNDARY CONDITIONS AND HEAT GENERATION. NONLINEAR PROPERTIES ARE ALSO ALLOWED AS WELL AS ANISOTROPY.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DARREL SVALSTAD
RE/SPEC, INC
(505) 394-6400

REFERENCE: UNKNOWN

CODE NAME: SPECTROM-55

VARIANTS: NONE

CODE TYPE: THERMAL
GEOSPHERE TRANSPORT

DESCRIPTION: SPECTROM-55 IS A FINITE ELEMENT COMPUTER PROGRAM DEVELOPED BY RE/SPEC INC. FOR ANALYSES OF COUPLED HEAT TRANSFER THROUGH A POROUS MEDIUM. THE PROGRAM PROVIDES TRANSIENT OR STEADY-STATE TEMPERATURES, PRESSURES, AND FLUID VELOCITIES RESULTING FROM THE APPLICATION OF A VARIETY OF INITIAL AND BOUNDARY CONDITIONS TO PLANAR OR AXISYMMETRIC BODIES.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: MESH GENERATOR

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): MARC C. LOKEN
RE/SPEC INC.
(605) 394-6400

REFERENCE: UNKNOWN

CODE NAME: SPEG

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
GEOSPHERE TRANSPORT

DESCRIPTION: CALCULATES PHYSICAL PROPERTIES OF BULK SAMPLES FOR
SPECIFIC GRAVITY, NATURAL BULK DENSITY, OVER-DRIED BULK
DENSITY, WEIGHT OF WATER IN AS-RECEIVED SAMPLE, PERCENT
OF MOISTURE BASED ON BOTH NATURAL AND DRIED SAMPLES, AND
WEIGHT OF WATER DISPLACED BY THE AS-RECEIVED SAMPLE AND
RELATIVE DENSITY OF WATER.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, PERSONAL COMPUTER

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER
295-7848

REFERENCE: ASTM PROCEDURE D1188-71, "SPECIFIC GRAVITY USING WAX
COATING"

CODE NAME: SPLITENS

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS

DESCRIPTION: CALCULATES SPLIT TENSILE STRENGTH OF GROUT AND CONCRETE.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER, IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER, MT.
295-7848

REFERENCE: UNKNOWN

CODE NAME: STALKS

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: EVALUATES ANALYTICAL SOLUTIONS OF THE DIFFUSION EQUATION FOR POINT, FINITE LINE, INFINITE LINE OR INFINITE PLANE SOURCES IN AN INFINITE HOMOGENEOUS ISOTROPIC MEDIUM WITH ARBITRARY SOURCE POWER HISTORY.

COMMENTS: THE "PLUS FAMILY".

COMPUTER(S): MAINFRAME, CDC, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): D.N. MONTAN
LLNL
(415) 422-3941

REFERENCE: UNKNOWN

CODE NAME: STEALTH 1.0

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS
THERMAL

DESCRIPTION: STEALTH IS A LAGRANGE, EXPLICIT FINITE-DIFFERENCE CODE FOR THERMOHYDRAULIC AND SOLID STRUCTURE, STRESS, AND FRACTURE ANALYSES BASED UPON THE COMPLETE SET OF DIFFERENTIAL EQUATIONS OF CONTINUUM MECHANICS. THE CODE IS FULLY NONLINEAR AND TREATS THE DYNAMIC PROBLEM ACCURATELY AND EFFICIENTLY. WITH DAMPING STATIC CASES ARE ALSO HANDLED SATISFACTORILY. CONSTITUTIVE RELATIONS NEED TO BE SUPPLIED, AND THE MODEL HAS BEEN USED WITH THE SAI CREEP MODEL FOR SALT WITH THE CODE CAVS FOR HARD ROCKS. THE DOCUMENTATION IS EXTENSIVE AND USER-ORIENTED.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: PREPROCESSOR - CAVS

EXTERNAL FILES: NONE

ACQUISITION: YES, USAGE FEE REQUIRED

RESPONDENT(S): E. G. MCNULTY
ONWI
(614) 424-5334

REFERENCE: UNKNOWN

CODE NAME: STRES3D

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS
THERMAL
ROCK MECHANICS

DESCRIPTION: STRESSES AROUND POINT HEAT SOURCES.

COMMENTS: NONE

COMPUTER(S): IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): C. ST. JOHN
AGAPITO & ASSOCIATES
(213) 544-0474

REFERENCE: UNKNOWN

CODE NAME: SUM

VARIANTS: NONE

CODE TYPE: MISCELLANEOUS

DESCRIPTION: THE SUM PROGRAM INTEGRATES GAMMA-RAY SPECTRAL DATA AND PRODUCES ACTIVITY VALUES BASED ON A LIBRARY CONTAINING THE INTEGRATION PARAMETERS.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): E.A. LEPEL
PNL

REFERENCE: UNKNOWN

CODE NAME: SUP-CRT
VARIANTS: NONE
CODE TYPE: GEOCHEMISTRY
DESCRIPTION: THERMODYNAMIC DATA BASE FOR MINERALS, GASES AND AQUEOUS SPECIES.
COMMENTS: NONE
COMPUTER(S): VAX
INTERFACES: NONE
EXTERNAL FILES: NONE
ACQUISITION: YES, NONPROPRIETARY
RESPONDENT(S): W.M. MURPHY
BWIP
(509) 376-2456
REFERENCE: UNKNOWN

CODE NAME: SURFACE 1.0

VARIANTS: NONE

CODE TYPE: OPERATIONS AND LOGISTICS

DESCRIPTION: SURFACE SIMULATES PROCESSING OF SPENT FUEL ASSEMBLIES VIA A SERIES OF OPERATIONS DEFINED BY THE USER TO BE REPRESENTATIVE OF A WASTE HANDLING BUILDING DESIGN.
INPUTS: TRANSPORT ARRIVAL FILE AND PROCESS NETWORK.
OUTPUTS: EMPTY CASK RELEASE REPORT, PROCESS STEP UTILIZATION STATISTICS, WASTE LOAD PROCESSING STATISTICS, AND CANISTER RELEASE REPORT.

COMMENTS: CURRENTLY PROGRAMMING VERSION 2.0 WHICH ADDRESSES MOST RECENT DESIGN AND OPERATIONS TRENDS AND WHICH WILL SIMULATE ROD CONSOLIDATION SCENARIOS. ESTIMATED AVAILABILITY: MARCH 1987.

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: TRANSPORT ARRIVAL FILE FROM LOGISTICS MODEL (OPTIONAL)

ACQUISITION: YES, RUN ACCESS ONLY

RESPONDENT(S): JACK T. URIE
ROY F. WESTON, INC.
(215) 692-3030

REFERENCE: UNKNOWN

CODE NAME: SUTRA

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
THERMAL

DESCRIPTION: THREE-DIMENSIONAL FINITE ELEMENT CODE TO SOLVE COUPLED
GROUNDWATER FLOW, ENERGY OR SOLUTE TRANSPORT IN
SATURATED AND UNSATURATED SYSTEM.

COMMENTS: THIS IS A U.S. GEOLOGICAL SURVEY CODE AVAILABLE FROM
USGS.

COMPUTER(S): MAINFRAME, IBM, VAX, CDC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): SUMANT GUPTA
ONWI
(614) 424-5074

REFERENCE: UNKNOWN

CODE NAME: SWENT 1.0

VARIANTS: SWIFT

CODE TYPE: GEOSPHERE TRANSPORT
THERMAL

DESCRIPTION: THREE-DIMENSIONAL FINITE DIFFERENCE ANALYSES OF FLOW,
ENERGY, SOLUTE AND RADIONUCLIDE TRANSPORT.

COMMENTS: NOT USED EXTENSIVELY FOR MULTIDIMENSIONAL RADIONUCLIDE
TRANSPORT.

COMPUTER(S): MAINFRAME, IBM, CDC, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): SUMANT GUPTA
ONWI
(614) 424-5074

REFERENCE: INTERA ENVIRONMENTAL CONSULTANTS, INC., SWENT: A THREE-
DIMENSIONAL FINITE-DIFFERENCE CODE FOR THE SIMULATION OF
FLUID, ENERGY , AND SOLUTE RADIONUCLIDE TRANSPORT, ONWI-
457, APRIL 1983.

CODE NAME: SYSNET

VARIANTS: BORHOL, NETFLO

CODE TYPE: SYSTEM MODELING
ROCK MECHANICS

DESCRIPTION: SYSTEMS NETWORK - ALLOWS BOREHOLE STUDIES.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): W.V. HARPER
ONWI
(614) 424-5099

REFERENCE: UNKNOWN

CODE NAME: TACO 2D

VARIANTS: HAS BEEN REPLACED BY TOPAZ 2D

CODE TYPE: THERMAL

DESCRIPTION: IMPLICIT FINITE ELEMENT CODE FOR HEAT-TRANSFER ANALYSIS,
LINEAR OR NONLINEAR, TRANSIENT OF STEADY-STATE,
CONDUCTION, CONVECTION, RADIATION.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CDC, CRAY

INTERFACES: POSTPROCESSOR- ORION, POSTACO
PREPROCESSOR - MAZE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ART SHAPIRO
LLNL
422-8676

REFERENCE: UNKNOWN

CODE NAME: TAURUS

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: AN INTERACTIVE POST-PROCESSOR FOR THE ANALYSIS CODES NIKE3D, DYNA3D, AND TACO3D.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CDC, CRAY

INTERFACES: POSTPROCESSOR- DYNA3D

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): JOHN HALLQUIST (DIANE CHINN)
LLNL
(415) 422-6844

REFERENCE: B. E. BROWN AND J. O. HALLQUIST, TAURUS: AN INTERACTIVE POST-PROCESSOR FOR THE ANALYSIS CODES NIKE3D, DYNA3D, TACO3D, AND GEMINI, UCID-19392, REV. 1, MAY 1984.

CODE NAME: TEMP

VARIANTS: NONE

CODE TYPE: THERMAL
ROCK MECHANICS

DESCRIPTION: THE TEMP CODES CALCULATES TEMPERATURES IN A BACKFILLED GEOLOGIC REPOSITORY FOR NUCLEAR WASTE. THE NUCLEAR WASTE IS MODELLED AS VERTICAL LINE SOURCES WITH A SPECIFIED LENGTH, IN A SPECIFIED ARRAY, AND IN AN INFINITE AND HOMOGENEOUS MEDIUM.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: POSTPROCESSOR- BRINEMIG, WAPPA-B, WAPPA-C

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): E.G. MCNULTY
ONWI
(614) 424-5334

REFERENCE: K. J. WURN ET AL., "TEMP: A FINITE LINE HEAT TRANSFER CODE FOR GEOLOGIC REPOSITORIES FOR NUCLEAR WASTE", BMI/ONWI-668, (OCT 1987), BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OH.

CODE NAME: TESDEM

VARIANTS: NONE

CODE TYPE: MAPPING

DESCRIPTION: DIGITAL ELEVATION MODELS (DEM) IN THE STANDARD USGS
FORMAT CAN BE COMPARED AGAINST TEST POINTS WITH KNOWN
X-Y-Z COORDINATES IN ORDER TO EVALUATE THE ACCURACY OF
THE DEM.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: UNDEVELOPED YET

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.H. MCINTOSH
ONWI
(614) 424-5797

REFERENCE: UNKNOWN

CODE NAME: THRDJRE 1.002

VARIANTS: THREEDDLS

CODE TYPE: GEOSPHERE TRANSPORT
RISK ASSESSMENT
MECHANICAL STRESS

DESCRIPTION: PERFORMS INVERSION OF TELESEISMIC TRAVEL TIME RESIDUALS
FOR RELATIVE COMPRESSIONAL-WAVE VELOCITY STRUCTURE.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): JOHN R. EVANS
U.S.GEOLOGICAL SURVEY
(415) 323-8111

REFERENCE: AKI, CHRISTOFFERSSON AND HUSABYE, J. GEOPHYSICS. RES.,
VOL. 82, 277-296, 1977.

CODE NAME: THREE

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: RECONSTRUCTION AND IMAGE DISPLAY FOR COMPUTED IMPEDANCE
TOMOGRAPHY - USES BACK PROJECTION TECHNIQUES.

COMMENTS: NONE

COMPUTER(S): UNKNOWN

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): WILLIAM DAILY, L-156
LLNL
(415) 422-8623

REFERENCE: UNKNOWN

CODE NAME: TOPAZ (2D/3D)

VARIANTS: TACO2D

CODE TYPE: THERMAL

DESCRIPTION: IMPLICIT FINITE ELEMENT CODE FOR HEAT-TRANSFER ANALYSIS,
LINEAR NONLINEAR, TRANSIENT OR STEADY STATE, CONDUCTION,
CONVECTION, RADIATION.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, CDC, CRAY

INTERFACES: POSTPROCESSOR- ORION (2D), TAURUS (3D)
PREPROCESSOR - MAZE (2D), SLIC (3D)

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ART SHAPIRO
LLNL
(415) 422-8676

WERNER STEIN
LLNL
(415) 422-0323

REFERENCE: ARTHUR B. SHAPIRO, TOPAZ3D - A THREE-DIMENSIONAL FINITE
ELEMENT HEAT TRANSFER CODE, UCID-20484, AUGUST 1985.

CODE NAME: TOSPAC

VARIANTS: NONE

CODE TYPE: SYSTEM MODELING
GEOSPHERE TRANSPORT
ROCK MECHANICS

DESCRIPTION: ONE-DIMENSIONAL FLOW AND RADIONUCLIDE TRANSPORT CODE FOR
PERFORMANCE ASSESSMENT OF A REPOSITORY LOCATED IN A
FRACTURED POROUS MEDIUM ABOVE THE WATER TABLE (e.g., THE
YUCCA MTN. SITE)

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): RALPH R. PETERS/M.S. TIERNEY
SANDIA NATIONAL LABS
(505) 844-4001

REFERENCE: UNKNOWN

CODE NAME: TPLOT

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: PLOTS GROUNDWATER TRAVEL TIME REALIZATIONS.

COMMENTS: TPLOT USES SUBROUTINES FROM THE DISPLAY LIBRARY.

COMPUTER(S): MINI

INTERFACES: PREPROCESSOR - PORMC-SF

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): P.M. CLIFTON
BASALT WASTE ISOLATION PROJECT
(509) 376-7522

REFERENCE: UNKNOWN

CODE NAME: TRACKER/TRAVEL 1.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: PERFORMS A PARTICLE TRACKING ANALYSIS OF TRANSPORT
THROUGH A FRACTURED MEDIUM.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: POSTPROCESSOR- MAGNUM-2D

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): TIM LEGORE
BASALT WASTE ISOLATION PROJECT
(509) 376-6310

REFERENCE: UNKNOWN

CODE NAME: TRACR 3D

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
ROCK MECHANICS

DESCRIPTION: TRACR3D IS A 1, 2 OR 3D MODEL OF SOLUTE TRANSPORT IN POROUS FRACTURED MEDIA WHICH CAN BE EITHER FULLY SATURATED OR NOT. THE PROGRAM TAKES ACCOUNT OF ADVECTION, DISPERSION, SORPTION AND N CHAIN RADIONUCLIDE DECAY. SORPTION IS INCLUDED EITHER AS A SIMPLE LINEAR EQUILIBRIUM MODEL OR AS A NONEQUILIBRIUM SATURABLE MODEL. THE LATTER MODEL CAN BE TAKEN AS REVERSIBLE OR IRREVERSIBLE. FRACTURES ARE TAKEN ACCOUNT OF BY CONSTRUCTING A NETWORK OF CRACKS, WHICH MAY ONLY RUN HORIZONTALLY OR VERTICALLY, AND ASSUMING THAT SOLUTE TRANSPORT OCCURS ONLY BY ADVECTION. THE FRACTURE NETWORK CAN BE CONSTRUCTED EXPLICITLY, IMPLICITLY (DISTRIBUTION OF CRACK WIDTHS AND FRACTURE SPACING PARAMETERS) OR RANDOMLY. SOLUTION IS BY AN IMPLICIT APPROACH FOR THE TRANSPORT EQUATIONS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, VAX, CDC, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): BRIAN J. TRAVIS
LOS ALAMOS NATIONAL LAB
FTS 843-1254

REFERENCE: UNKNOWN

CODE NAME: TRANQL 2

VARIANTS: NONE

CODE TYPE: GEOCHEMISTRY
GEOSPHERE TRANSPORT

DESCRIPTION: TO TRANQL THE EQUILIBRIUM CHEMISTRY IS POSED
INDEPENDENTLY OF THE MASS TRANSPORT EQUATIONS WHICH
LEADS TO A SET OF ALGEBRAIC EQUATIONS FOR THE CHEMISTRY
COUPLED TO A SET OF DIFFERENTIAL EQUATIONS FOR THE
TRANSPORT. TRANQL CAN BE USED TO INVESTIGATE THE
EFFECTS OF GEOCHEMICAL PROCESSES ON THE RETARDATION AND
TRANSPORT OF RADIONUCLIDES.

COMMENTS: NONE

COMPUTER(S): IBM, VAX

INTERFACES: NONE

EXTERNAL FILES: THERMODYNAMIC DATA BASE FOR GEOCHEMICAL REACTIONS.

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): G.A. CEDERBERG
LOS ALAMOS NATIONAL LABORATORY
(505) 667-6384

REFERENCE: UNKNOWN

CODE NAME: TRANSIT

VARIANTS: NONE

CODE TYPE: OPERATIONS AND LOGISTICS
TRANSPORTATION

DESCRIPTION: 1ST ORDER CODE TO ASSESS REGIONAL TRANSPORTATION IMPACTS
FOR SHIPPING MATERIALS TO AN INTERMEDIATE OR FINAL
FACILITY.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER, IBM

INTERFACES: POSTPROCESSOR- WASTES

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): GARY W. MCNAIR
PNL
(509) 376-4435

REFERENCE: UNKNOWN

CODE NAME: TRUMP - NO TRUMP

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: TRUMP EVALUATES 1D, 2D, OR 3D TEMPERATURE DISTRIBUTIONS (OR ANALOGOUS QUANTITIES) FOR STEADY STATE OR TRANSIENT CONDITIONS. THE THERMAL INPUT MAY BE DUE TO CHEMICAL EFFECTS (OR RADIOACTIVE DECAY), POSSIBLY INVOLVING PHASE CHANGES, AS WELL AS THE USUAL POINT SOURCES. THE PROGRAM USES A FINITE DIFFERENCE METHOD AND ALLOWS THE EQUATION PARAMETERS TO VARY WITH POSITION, TIME OR FIELD VARIABLES. TIME STEPPING IS BY A COMBINATION OF IMPLICIT AND EXPLICIT SCHEMES. A WIDE VARIETY OF INITIAL AND BOUNDARY CONDITIONS IS AVAILABLE. THE PROGRAM HAS BEEN USED TO PREDICT THE 3D UNSTEADY-STATE TEMPERATURE PROFILES WITHIN A UNIT CELL OF A DEEP GEOLOGICAL WASTE REPOSITORY.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, CDC, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): D.N. MONTAN
LAWRENCE LIVERMORE NAT. LAB.
(415) 422-3941

REFERENCE: ARTHUR L. EDWARDS, TRUMP: A COMPUTER PROGRAM FOR TRANSIENT AND STEADY-STATE TEMPERATURE DISTRIBUTIONS IN MULTIDIMENSIONAL SYSTEMS, UCRL-14754 REV. 3, SEPTEMBER 1, 1972.

CODE NAME: TRUST

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
MECHANICAL STRESS
ROCK MECHANICS

DESCRIPTION: 3-D SATURATED AND UNSATURATED FLOW WITH DEFORMATION OF POROUS MATRIX, FRACTURED MEDIA, TIME-DEPENDENT BOUNDARY CONDITIONS AND SOURCES, COMPLEX GEOMETRY. TRUST (BASED ON THE TRUMP MODEL, WHICH IS ACTUALLY A COMPUTER PROGRAM FOR TRANSIENT AND STEADY-STATE TEMPERATURE DISTRIBUTIONS IN MULTIDIMENSIONAL SYSTEMS) HAS BEEN USED IN SUBSURFACE FLOW AND INVOLVES INTEGRATED FINITE DIFFERENCE METHODS (IFDM). THE IFDM METHODS, WIDELY USED EFFECTIVELY FOR SOME TIME, WERE APPARENTLY DEVELOPED DURING THE EARLY 1960'S FROM THE ENGINEER'S FEEL FOR THE PHYSICAL SYSTEM AND HAVE ONLY MORE RECENTLY GAINED THE RESPECTABILITY OF FORMAL MATHEMATICAL DERIVATION. SUCH METHODS ARE SIMILAR TO THE GELERKIN FINITE-ELEMENT APPROACH, AND THE BEST FEATURES OF BOTH MAY BE INCORPORATED INTO FUTURE IMPROVED MODELS (ARH-ST-140).

COMMENTS: NONE

COMPUTER(S): IBM, VAX, CDC, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): T.N. NARASIMHAN
LBL
FTS 451-5655

REFERENCE: T. N. NARASIMHAN, P. A. WITHERSPOON, AND A. L. EDWARDS, NUMERICAL MODEL FOR SATURATED-UNSATURATED FLOW IN DEFORMABLE POROUS MEDIA. 2. THE ALGORITHM, WATER RESOURCES RESEARCH, VOL. 14, NO. 2, PP. 255-260, APRIL 1978.

CODE NAME: TSAP
VARIANTS: NONE
CODE TYPE: THERMAL
DESCRIPTION: FINITE VOLUME HEAT TRANSFER CODE.
COMMENTS: NONE
COMPUTER(S): IBM
INTERFACES: NONE
EXTERNAL FILES: NONE
ACQUISITION: NO, PROPRIETARY
RESPONDENT(S): R. TOYOAKA
BASALT WASTE ISOLATION PROJECT
(509) 376-0338
REFERENCE: UNKNOWN

CODE NAME: TUBEDENS

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS

DESCRIPTION: CALCULATES DENSITY AND MOISTURE OF UNCOLIDATED SOIL OR
ROCK SAMPLES.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER, IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER, MTL
295-7848

REFERENCE: UNKNOWN

CGDE NAME: TURBOSEIS 1.000

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS

DESCRIPTION: ALLOWS THE USER TO INTERACTIVELY CONSTRUCT A MODEL OF REFRACTION SEISMIC DATA USING A COLOR-GRAPHICS TERMINAL. THE MODELS ARE USED BY OTHER PROGRAMS IN CALCULATING THE SEISMIC VELOCITY LAYERS.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): BRUCE A. CHUCHEL
U.S. GEOLOGIC SURVEY
(415) 323-8111

REFERENCE: UNKNOWN

CODE NAME: TUSC 1.0

VARIANTS: NONE

CODE TYPE: SYSTEM MODELING
GEOSPHERE TRANSPORT

DESCRIPTION: POSTCLOSURE TOTAL REPOSITORY SYSTEM MODEL TO ESTIMATE
RADIONUCLIDE RELEASES TO THE ACCESSIBLE ENVIRONMENT.
ALSO PROVIDES FOR STATISTICAL VARIATION OF INPUT
PARAMETERS.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): S. BLOOM
ORNL
(615) 574-6638

REFERENCE: UNKNOWN

CODE NAME: TWIGS

VARIANTS: NONE

CODE TYPE: THERMAL

DESCRIPTION: EVALUATES ANALYTICAL SOLUTIONS OF THE DIFFUSION EQUATION FOR POINT, FINITE LINE, INFINITE LINE OR INFINITE PLANE SOURCES IN AN INFINITE HOMOGENEOUS ISOTROPIC MEDIUM WITH ARBITRARY SOURCE POWER HISTORY.

COMMENTS: THE "PLUS FAMILY".

COMPUTER(S): MAINFRAME, CDC, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): D.N. MONTAN
LLNL
(415) 422-3941

REFERENCE: UNKNOWN

CODE NAME: TWODANT

VARIANTS: NONE

CODE TYPE: NUCLEAR RADIATION TRANSPORT

DESCRIPTION: SOLVES TWO-DIMENSIONAL RADIATION TRANSPORT EQUATION (BOLTZMANN EQUATION) FOR NEUTRONS AND GAMMA RAYS IN CARTESIAN OR CYLINDRICAL COORDINATES, BY FINITE-DIFFERENCE TECHNIQUES.

COMMENTS: NONE

COMPUTER(S): CRAY

INTERFACES: PREPROCESSOR - TRANSX-CTR

EXTERNAL FILES: CROSS SECTION LIBRARIES

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.K. TERRY
BASALT WASTE ISOLATION PROJECT
(509) 376-6992

REFERENCE: RAY E. ALCOUFFE, FORREST W. BRINKLEY, DUANE R. MARR, AND R. DOUGLAS O'DELL, "USER'S GUIDE FOR TWODANT: A CODE PACKAGE FOR TWO-DIMENSIONAL, DIFFUSION-ACCELERATED, NEUTRAL-PARTICLE TRANSPORT," LA-10049-M REV. 1 (OCTOBER 1984).

CODE NAME: UCBNE 10.2

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
GEOCHEMISTRY

DESCRIPTION: UCB-NE-10.2 SOLVES THE 1D TRANSIENT MASS TRANSPORT EQUATIONS FOR A RADIONUCLIDE DECAY CHAIN. THE CODE DESCRIBES THE FOLLOWING PHYSICAL PROCESSES: CONVECTION, DISPERSION, EQUILIBRIUM SORPTION, EQUILIBRIUM FLUID-PHASE CHEMICAL REACTIONS, NUCLIDE SOLUBILITY, AND THREE-MEMBER RADIOACTIVE CHAIN DECAY. THE FLOW IS STEADY, THE MEDIUM IS HOMOGENEOUS, AND THE RELEASE RATE AT THE SOURCE IS CONSTANT OVER A FINITE TIME PERIOD. THE DISSOLVED NUCLIDE CAN HAVE MULTIPLE CHEMICAL SPECIES IN EQUILIBRIUM WITH ONE ANOTHER, AND THE FIRST MEMBER OF THE CHAIN CAN HAVE A SOLUBILITY LIMIT AT THE SOURCE. UCB-NE-10.2 USES A CLOSED FORM ANALYTICAL SOLUTION.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, CDC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): G. JANSEN
ONWI
(614) 424-7317

REFERENCE: M. HARADA, P. L. CHAMBRE ET AL., MIGRATION OF RADIONUCLIDES THROUGH SORBING MEDIA, ANALYTICAL SOLUTIONS - I, ONWI-359 (LBL-10500), FEBRUARY 1980.

CODE NAME: UCLA 3D

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: 3-D GROUNDWATER EQUATIONS ARE SOLVED ON FINITE ELEMENT
SCHEME. (THE CODE WAS DEVELOPED BY UCLA.)

COMMENTS: NONE

COMPUTER(S): UNIVAC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): ALLEN LU
BWIP
(509) 376-1113

REFERENCE: UNKNOWN

CODE NAME: UDEC ICG 1.1

VARIANTS: UDEC-T

CODE TYPE: ROCK MECHANICS
MECHANICAL STRESS
THERMAL

DESCRIPTION: DISCRETE ELEMENT METHOD, DYNAMIC ANALYSIS OF INTERACTING
BLOCKS OF ROCK. UDEC-T ADDS THERMAL ANALYSIS
CAPABILITIES. DYNAMIC EQUATIONS ARE SOLVED USING
EXPLICIT TIME-MARCHING SCHEME.

COMMENTS: CONCEPTUAL MODEL DEVELOPMENT FOR DESIGN, PERFORMANCE
ASSESSMENT.

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): K.S. DONOVAN
BWIP
(509) 376-9714

REFERENCE: UNKNOWN

CODE NAME: UNIVERSAL TRANSVERSE MERCATOR

VARIANTS: NONE

CODE TYPE: MAPPING

DESCRIPTION: CONVERTS GEODETIC COORDINATES TO UNIVERSAL TRANSVERSE
MERCATOR (UTM) X-Y COORDINATES OR VICE VERSA.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: UNDEVELOPED YET

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.H. MCINTOSH
ONWI
(614) 424-5797

REFERENCE: UNKNOWN

CODE NAME: UNSAT2-VARIABLY SATURATED FLOW

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: UNSAT 2 IS A FINITE ELEMENT PROGRAM DEVELOPED FOR SOLVING PROBLEMS OF NON-STEADY SEEPAGE IN SATURATED-UNSATURATED POROUS MEDIA, INVOLVING TWO SPATIAL DIMENSIONS IN THE HORIZONTAL OR VERTICAL PLANE. THREE-DIMENSIONAL PROBLEMS CAN BE HANDLED PROVIDED THAT THE FLOW PATTERN RETAINS AN AXIAL SYMMETRY ABOUT THE VERTICAL CO-ORDINATE. THE FLOW REGION MAY HAVE ANY COMPLEX SHAPE AND IT MAY CONSIST OF DIFFERENT SOIL MATERIALS ARRANGED IN ARBITRARY PATTERNS. EACH SOIL PROPERTY MAY EXHIBIT AN ARBITRARY DEGREE OF LOCAL ANISOTROPY, WITH PRINCIPAL HYDRAULIC CONDUCTIVITIES ORIENTED AT ANY DESIRED ANGLE WITH RESPECT TO THE CO-ORDINATES. A WIDE RANGE OF TIME-DEPENDENT BOUNDARY CONDITIONS CAN BE TREATED. IN ADDITION, THE PROGRAM CAN HANDLE WATER UPTAKE BY PLANTS ASSUMING THAT THE MAXIMUM RATE OF TRANSPIRATION IS DETERMINED BY ATMOSPHERIC CONDITIONS, WHILE THE ACTUAL RATE OF UPTAKE DEPENDS ON ATMOSPHERIC AS WELL AS SOIL AND PLANT CONDITIONS. INTERNAL VOLUMETRIC SINKS OR SOURCES OF PRESCRIBED STRENGTH CAN BE INCLUDED IN THE FLOW SYSTEM AT ANY STAGE OF THE COMPUTATION. UNSAT 2 IS CONSIDERED A FAR-FIELD CODE IN THE SENSE THAT THE FLOW IS ANALYZED OUTSIDE THE DISTURBED ZONE.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DWIGHT T. HOXIE
USGS
(303) 236-5019

REFERENCE: UNKNOWN

CODE NAME: US2D

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: USGS2D IS A FINITE DIFFERENCE SATURATED FLOW CODE. IT IS RESTRICTED TO TWO-DIMENSIONAL (AREAL) FLOW, BUT PROVIDES THE USER WITH A VARIETY OF OPTIONS FOR GROUND-WATER FLOW CONDITIONS, SOURCE TERMS, NUMERICAL SOLUTION TECHNIQUES, AND INPUT-OUTPUT. THE OPTIONS FOR GROUND-WATER FLOW CONDITIONS INCLUDE ARTESIAN CONDITIONS, WATER-TABLE CONDITIONS, AND COMBINED ARTESIAN/WATER TABLE CONDITIONS. VARIATIONS OF SOURCE TERMS INCLUDE TRANSIENT LEAKAGE FROM CONFINING BEDS, STEADY LEAKAGE FROM CONFINING BEDS, RECHARGE, PUMPING WELLS, AND EVAPOTRANSPIRATION. THE CODE WAS DESIGNED TO STIMULATE A VARIETY OF GROUND-WATER FLOW CONDITIONS WITHIN AN AQUIFER IN WHICH THE FLOW FIELD MAY BE TREATED USING AN AREAL APPROXIMATION. USGS2D MAY BE USED TO EXAMINE CONDITIONS IN THE REGIONAL AREA.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, IBM, CDC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DWIGHT T. HOXIE
USGS
(303) 236-5019

JOHN CZARNECKI
USGS
(303) 236-5176

REFERENCE: UNKNOWN

CODE NAME: USGS MODULAR FLOW MODEL

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: ANALYSIS OF GROUNDWATER FLOW IN POROUS MEDIA. THREE-DIMENSIONAL FINITE DIFFERENCE CODE. VERY WELL DOCUMENTED.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, CDC

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): BRIAN Y. KANEHIRO
BERKELEY HYDROTECHNIQUE, INC.
(415) 549-9570

REFERENCE: UNKNOWN

CODE NAME: VALLEY 5

VARIANTS: NONE

CODE TYPE: AIR DISPERSION

DESCRIPTION: MULTI-USE POLAR GRID MODEL FOR USE MAINLY IN THE AREAS
OF SIGNIFICANT TERRAIN RELIEF.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, UNIVAC

INTERFACES: NONE

EXTERNAL FILES: INPUT FILE, USER GENERATED

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): JOEL REISSMAN
BECHTEL NATIONAL, INC.
(415) 768-2526

REFERENCE: UNKNOWN

CODE NAME: VDGWF 1.0

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT
SYSTEM MODELING

DESCRIPTION: VDGWF VARIABLE DENSITY GROUNDWATER FLOW SIMULATOR IN
THREE DIMENSIONS. IT SIMULATES TRANSIENT CONDITION OF
GROUNDWATER FLOW.

COMMENTS: THE CODE DOES NOT SIMULATE TRANSPORT OF SOLUTES

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): J. S. WEISS
ONWI
(614) 424-4389

REFERENCE: UNKNOWN

CODE NAME: VIEWIT

VARIANTS: NONE

CODE TYPE: MAPPING

DESCRIPTION: CODE DETERMINES THE VISIBILITY OF A POINT OVER A GIVEN TOPOGRAPHIC SURFACE.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, UNIVAC

INTERFACES: NONE

EXTERNAL FILES: DEFENSE MAPPING AGENCY - DIGITAL TERRAIN DATA

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): CHARLES HARTEL
BECHTEL NATIONAL, INC.
(415) 768-6207

REFERENCE: UNKNOWN

CODE NAME: VISCOT

VARIANTS: NONE

CODE TYPE: MECHANICAL STRESS
ROCK MECHANICS

DESCRIPTION: VISCOT IS GENERAL NON-LINEAR TWO-DIMENSIONAL FINITE ELEMENT CODE THAT ANALYSES VISCOPLASTIC MATERIAL BEHAVIOR IN A SYSTEM SUBJECTED TO MECHANICAL AND/OR THERMAL LOADING. IT CAN HANDLE PLANE STRESS, PLANE STRAIN, AND AXISYMMETRIC GEOMETRIES. VISCOT ASSUMES ALL MATERIAL BEHAVIOR TO BE ISOTROPIC, INCLUDING PLASTIC DEFORMATION, ELASTIC RESPONSE, AND THERMAL EXPANSION. A LINEAR STRAIN-HARDENING RULE IS ALSO ASSUMED. VISCOT CAN PERFORM ELASTIC-PLASTIC ANALYSIS USING DYNAMIC RELAXATION. BY USING A YIELD STRENGTH OF ZERO, THE CODE CAN MODEL VISCOELASTIC RESPONSE. IN ADDITION, VISCOT IS FLEXIBLE IN ALLOWING THE CHOICE OF VON MISES, TRESCA, DRUCKER-PRAGER, OR MOHR-COULOMB YIELD CRITERIA. HETEROGENEOUS MATERIAL PROPERTIES ARE ALLOWED. VISCOT DOES NOT HANDLE THE ANALYSIS OF FRACTURED SYSTEMS.

COMMENTS: NONE

COMPUTER(S): IBM COMPATIBLE

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): C. ST. JOHN
AGAPITO & ASSOCIATES
(213) 544-0474

REFERENCE: INTERA ENVIRONMENTAL CONSULTANTS, INC., VISCOT: A TWO-DIMENSIONAL AND AXISYMMETRIC NONLINEAR TRANSIENT THERMOVISCOELASTIC AND THERMOVISCOPLASTIC FINITE-ELEMENT CODE FOR MODELING TIME-DEPENDENT VISCOUS MECHANICAL BEHAVIOR OF A ROCK MASS, ONWI-437, APRIL 1983.

CODE NAME: VNETPC

VARIANTS: NONE

CODE TYPE: HVAC

DESCRIPTION: "VNETPC" IS A MICRO-COMPUTER SOFTWARE PACKAGE DESIGNED SPECIFICALLY TO ASSIST IN THE DESIGN, PLANNING AND CONTROL OF UNDERGROUND VENTILATION SYSTEMS.

COMMENTS: NONE

COMPUTER(S): PERSONAL COMPUTER

INTERFACES: PREPROCESSOR - CLIMSIM

EXTERNAL FILES: NONE

ACQUISITION: NO, PROPRIETARY

RESPONDENT(S): KEITH WALLACE
MINE VENTILATION SERVICES
(415) 284-5912

REFERENCE: UNKNOWN

CODE NAME: VSFAST - VARIABLY SATURATED

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: GALERKIN, FINITE-ELEMENT, TWO DIMENSIONAL LIQUID WATER
FLOW AND SOLUTE TRANSPORT IN VARIABLY SATURATED POROUS
MEDIA.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): DWIGHT T. HOXIE
USGS
(303) 236-5019

REFERENCE: UNKNOWN

CODE NAME: WADCOM-MF6

VARIANTS: WADCOMP-MF1 THROUGH MF5

CODE TYPE: TOTAL SYSTEM LIFE CYCLE COST
OPERATIONS AND LOGISTICS
TRANSPORTATION

DESCRIPTION: TOTAL SYSTEM LIFE CYCLE COST TRADE-OFF ANALYTICAL CODE.
PARAMETRIC IN NATURE. FLEXIBLE STRUCTURE SO MANY SYSTEM
CONFIGURATIONS CAN BE MODELED.

COMMENTS: NONE

COMPUTER(S): UNIVAC

INTERFACES: PREPROCESSOR - WADWIT

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): GREGORY HARTKOPF
ROY F. WESTON, INC.
(202) 646-6600

REFERENCE: UNKNOWN

CODE NAME: WADWIT

VARIANTS: NONE

CODE TYPE: OPERATIONS AND LOGISTICS

DESCRIPTION: SPENT FUEL LOGISTICS PRE-PROCESSOR FOR WADCOM-MF6.

COMMENTS: NONE

COMPUTER(S): UNIVAC

INTERFACES: POSTPROCESSOR- WADCOM-MF6

EXTERNAL FILES: NONE

ACQUISITION: UNKNOWN

RESPONDENT(S): GREGORY HARTKOPF
ROY F. WESTON, INC.
(202) 646-6600

REFERENCE: UNKNOWN

CODE NAME: WAFEC

VARIANTS: WAFE

CODE TYPE: GEOSPHERE TRANSPORT
THERMAL

DESCRIPTION: 1 OR 2-D, STEADY OR TRANSIENT, SAT./UNSATURATED FLOW OF
(VAPORIZATION, CONDENSATION, ETC.) COUPLED TO TRANSPORT
OF RADIOACTIVE, SORBING SPECIES, AND ALLOWING
DISSOLUTION/PRECIPITATION OF MINERAL PHASES.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, MINI, VAX, CDC, CRAY

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): BRYAN J. TRAVIS
LOS ALAMOS NATIONAL LABORATORY
(505) 667-1254

REFERENCE: UNKNOWN

CODE NAME: WAPPA (B/C)

VARIANTS: WAPPA-B 2.00, WAPPA-C 3.00

CODE TYPE: SYSTEM MODELING

DESCRIPTION: WAPPA-B (WASTE PACKAGE PERFORMANCE ASSESSMENT)
CALCULATES UNIFORM CORROSION AND FAILURE OF METAL
BARRIERS. WAPPA-C CALCULATES NONUNIFORM CORROSION
FAILURE OF METAL BARRIERS AND RADIONUCLIDE RELEASE FROM
THE WASTE PACKAGE.

COMMENTS: ALTHOUGH CODE WAPPA-B 2.00 WAS USED FOR EA, CODE
WAPPA-B2.01 IS RECOMMENDED FOR THE FUTURE UNIFORM
CORROSION CALCULATIONS.

COMPUTER(S): MINI, VAX

INTERFACES: POSTPROCESSOR- NE-UCB
PREPROCESSOR - BRINETEMP, ORIGEN2

EXTERNAL FILES: NONE

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): G. JANSEN
ONWI
(614) 424-7317

REFERENCE: INTERA ENVIRONMENTAL CONSULTANTS, INC., WAPPA: A WASTE
PACKAGE PERFORMANCE ASSESSMENT CODE, ONWI-452, APRIL
1983.

CODE NAME: WASTEO

VARIANTS: NONE

CODE TYPE: OPERATIONS AND LOGISTICS
RISK ASSESSMENT
TRANSPORTATION

DESCRIPTION: ESTIMATES SYSTEM LOGISTICS BASED ON MINIMIZING A
WEIGHTED COMBINATION OF COST AND RISK. TRACKS ANNUAL
FLOWS FROM INDIVIDUAL REACTORS TO AN MRS OR REPOSITORY.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: NONE

EXTERNAL FILES: PNL SPENT FUEL DATA BASE/ROUTE SPECIFIC FILE GENERATED
BY ORNL.

ACQUISITION: NO, INCOMPLETE

RESPONDENT(S): MICHAEL R. SHAY
PNL
(509) 376-4654

REFERENCE: UNKNOWN

CODE NAME: WASTES-II

VARIANTS: WASTES-I, ALL VER.,

CODE TYPE: SYSTEM MODELING
OPERATIONS AND LOGISTICS
TOTAL SYSTEM LIFE CYCLE COST

DESCRIPTION: WASTES SIMULATES THE MOVEMENT OF SPENT FUEL WITHIN THE WASTE MANAGEMENT SYSTEM. THE MODEL CAN ACCOUNT FOR THE CHARACTERISTICS OF FUEL INVENTORY AT VARIOUS FACILITIES. ADDITIONALLY MODEL CALCULATES TRANSPORTATION AND AT-REACTOR STORAGE COSTS.

COMMENTS: NONE

COMPUTER(S): VAX

INTERFACES: POSTPROCESSOR- DISPATCH, FALSIM

EXTERNAL FILES: PNL SPENT FUEL DATA BASE

ACQUISITION: YES, RUN ACCESS ONLY

RESPONDENT(S): MICHAEL R. SHAY
PNL
(509) 376-4654

REFERENCE: UNKNOWN

CODE NAME: WATER MOVEMENT

VARIANTS: NONE

CODE TYPE: GEOSPHERE TRANSPORT

DESCRIPTION: FINITE ELEMENT, FLUID MOVEMENT IN UNSATURATED ZONE.

COMMENTS: ORIGINATOR-ORNL-1975-(ORNL-4927)

COMPUTER(S): MAINFRAME, CRAY

INTERFACES: POSTPROCESSOR- MASS TRANS.

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): G.E. BARR
SANDIA NATIONAL LABS
FTS 844-8532

REFERENCE: UNKNOWN

CODE NAME: WITCOM 7

VARIANTS: WITCOM, V.1,2,3,4,5,6

CODE TYPE: TOTAL SYSTEM LIFE CYCLE COST

DESCRIPTION: ACCEPTING PRE-PROCESSED WASTES LOGISTICS DATA,
REPOSITORY AND MRS COST DATA, AND D & E COST DATA,
WITCOM CALCULATES TRANSPORTATION COSTS FOR NUCLEAR WASTE
PROGRAM AND PRODUCES A SUMMARY TABLE OF ALL TSLCC COSTS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, UNIVAC

INTERFACES: PREPROCESSOR - WASTES

EXTERNAL FILES: WASTES FILES FROM PNL AND REPCOST FILES

ACQUISITION: YES, RUN ACCESS ONLY

RESPONDENT(S): PETER K. HALL
ROY F. WESTON, INC.
(215) 692-3030

REFERENCE: UNKNOWN

CODE NAME: WPRM

VARIANTS: NONE

CODE TYPE: ROCK MECHANICS

DESCRIPTION: CALCULATES WATER PERMEABILITY THROUGH MEDIUM, SUCH AS
ROCK CORE AND SOIL SAMPLES.

COMMENTS: NONE

COMPUTER(S): MAINFRAME

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER, MTL
295-7848

REFERENCE: API PROCEDURE RP-27 AND GWPRM FOR PLOTTING.

CODE NAME: X-Y LATITUDE-LONGITUDE & GRID

VARIANTS: NONE

CODE TYPE: MAPPING

DESCRIPTION: TRANSFORMS GEOGRAPHIC OR PLANE CONTROL POINTS INTO A KNOWN SYSTEM TO DEVELOP TRANSFORMATION PARAMETERS.

COMMENTS: NONE

COMPUTER(S): MINI, VAX

INTERFACES: NONE

EXTERNAL FILES: UNDEVELOPED YET

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): W.H. MCINTOSH
ONWI
(614) 424-5797

REFERENCE: UNKNOWN

CODE NAME: XOQDOQ.3P

VARIANTS: XOQDOQ.1P, 2P

CODE TYPE: AIR DISPERSION
DOSE-TO-MAN

DESCRIPTION: XOQDOQ IS A COMPUTER CODE USED BY THE NRC IN ITS LONG TERM METEOROLOGICAL EVALUATION FOR ROUTINE RELEASES FROM COMMERCIAL NUCLEAR POWER REACTORS. USING A STRAIGHT-LINE AIRFLOW MODEL, THIS CODE IMPLEMENTS THE ASSUMPTIONS OUTLINED IN SECTION C (EXCLUDING CLA AND CLB) OF REGULATORY GUIDE 1.111, METHODS FOR ESTIMATING ATMOSPHERIC TRANSPORT AND DISPERSION OF GASEOUS EFFLUENTS IN ROUTINE RELEASES FROM LIGHT-WATER-COOLED REACTORS. FOR ROUTINE PLANT RELEASES, IT CALCULATES AVERAGE RELATIVE EFFLUENT CONCENTRATIONS AND AVERAGE RELATIVE DEPOSITION VALUES (D/Q'S) AT LOCATIONS SPECIFIED BY THE USER, AND AT STANDARD RADIAL DISTANCES AND SEGMENTS FOR DOWNWIND SECTORS. IT ALSO CALCULATES THESE VALUES AT SPECIFIED LOCATIONS FOR INTERMITTENT RELEASES.

COMMENTS: NONE

COMPUTER(S): MINI

INTERFACES: POSTPROCESSOR- CASPAR, REV1

EXTERNAL FILES: MET. DATA AND SOURCE TERM INFORMATION

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): MIKE SEPTOFF
NUS
(301) 258-6000

REFERENCE: J. F. SAGENDORF, J. T. GOLL, AND W. F. SANDUSKY, "SOQDOQ COMPUTER PROGRAM FOR THE METEOROLOGICAL EVALUATION OF ROUTINE EFFLUENT RELEASES AT NUCLEAR POWER STATIONS," NUREG/CR-2919 (PNL-4380) (SEPTEMBER 1982).

CODE NAME: XRFE

VARIANTS: NONE

CODE TYPE: GEOCHEMISTRY

DESCRIPTION: ATTEMPTS TO MATCH THE X-RAY FLUORESCENCE RESULTS OF AN UNKNOWN TO THAT OF NEARLY 100 ELEMENT STANDARDS INCLUDING CARBON AND ALLOY STEELS, HEAT AND CORROSION STEELS.

COMMENTS: NONE

COMPUTER(S): MAINFRAME

INTERFACES: NONE

EXTERNAL FILES: NONE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): TOM HURST
HOLMES AND NARVER, MTL
295-7848

REFERENCE: UNKNOWN

CODE NAME: XSDOSE

VARIANTS: NONE

CODE TYPE: DOSE-TO-MAN
NUCLEAR RADIATION TRANSPORT

DESCRIPTION: COMPUTES LAMBDA/GAMMA FLUX AND THE RESULTING DOSE AT
SPECIFIED POINTS OUTSIDE A FINITE SHIELD.

COMMENTS: NONE

COMPUTER(S): MAINFRAME, IBM, CRAY

INTERFACES: PREPROCESSOR - ANISN, XSDRNPM-S

EXTERNAL FILES: ANISN OR XSDRNPM ANGULAR FLUX FILE

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): J.A. BUCHOLZ
ORNL
(615) 574-5253

REFERENCE: J. A. BUCHOLZ, "XSDOSE: A MODULE FOR CALCULATING FLUXES
AND DOSE RATES AT POINTS OUTSIDE A SHIELD", NUREG/CR-
0200, VOLUME 2, SECTION F4, OAK RIDGE NATIONAL
LABORATORY, OAK RIDGE, TN.

CODE NAME: XSDRNPM

VARIANTS: XSDRN, XSDRNPM-S

CODE TYPE: NUCLEAR RADIATION TRANSPORT
DOSE-TO-MAN

DESCRIPTION: 1-DIMENSIONAL NEUTRON/PHOTON TRANSPORT THEORY USING
DISCRETE ORDINATES TECHNIQUE.

COMMENTS: NONE

COMPUTER(S): VAX, UNIVAC, IBM, CRAY

INTERFACES: PREPROCESSOR - NITAWL

EXTERNAL FILES: AMPX LIBRARY

ACQUISITION: YES, NONPROPRIETARY

RESPONDENT(S): URBAN JENQUIN
BATTELLE - NORTHWEST
(509) 376-4119

L.M. PETRIE
ORNL
(615) 574-5259

REFERENCE: N. M. GREENE ET AL., "AMPX: A MODULAR CODE SYSTEM FOR
GENERATING COUPLED MULTIGROUP NEUTRON-GAMMA LIBRARIES
FROM ENDF/B," ORNL/TM-3706 (MARCH 1976).

APPENDIX A

CONTRIBUTORS TO THE COMPENDIUM

The list of contributors to the compendium has been updated to reflect, where possible, the current status of each contributor of codes listed in Sect. 3. Those contributors are listed below, alphabetically by company name. Contributor names followed by (**) appear to have left employment of the company by which they are listed. The phone numbers for each person have been removed for individuals at large companies, and the general information number for the company has been provided. While many of the phone numbers listed in Sect. 3 may be correct, it was impossible to verify and/or update each listing.

APPENDIX A

Agapito & Associates, 715 Horizon Dr., Suite 340, Grand Junction, CO
81506, (303) 242-4220:

C. St. John

Basalt Waste Isolation Project (BWIP), Westinghouse Hanford Company, PO
Box 1970, Richland, WA 99352, (509) 444-7511 (Richland operator):

R. C. Arnett	T. Legore
C. Bromley	G. A. Lehmann
W. H. Chen	A. Lu
P. M. Clifton	M. D. Mitchell
E. Craft	W. M. Murphy
I. J. Dempster	D. L. Saul
K. S. Donovan	R. W. Smith
P. W. Eslinger	J. L. Spurgeon
C. H. (Chester) Huang	W. K. Terry
N. W. Kline	R. Toyoaka
M. Kummerer	G. L. Underberg
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APPENDIX B

SUMMARY OF COMPUTER CODE LITERATURE

This appendix provides a summary listing of the literature used in the preparation of this report. As stated in Sects. 1 and 2, the references listed in this appendix represent a number of previous computer code compendia. From the documents, a list of over 1000 different computer code names was extracted. Only about 100 of the computer codes named in Sect. 3 were found among the 1000 code names found in these many references.

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APPENDIX C

GLOSSARY OF COMPUTER CODE TERMINOLOGY

This appendix provides a glossary of common terms and definitions used to describe computers, computer codes, mathematical modeling, and the use of computer codes to analyze scientific or engineering problems.

APPENDIX C

Acceptance testing	When a computer code is installed on a computer for operation, acceptance testing is performed by the user to: (1) evaluate function, performance and interfaces; and (2) assure that calculation results obtained with the installed code are consistent with calculational results obtained when the computer code was developed and tested.
Application	Use of a computer code, program, model, software, or other computer items to solve specific problems.
Baseline documents	Minimum documents required to describe a computer code, which includes: (1) users' instructions (i.e., "Users' Guide"); (2) a code listing (i.e., part of "Programmer's Guide"); (3) internal verification documentation (i.e., "Assessment Report"); and (4) descriptions of numerical methods and mathematical models (i.e., "Technical Reference Manual").
Benchmark	A benchmark (as in "benchmark experiment") is a standard condition which may be used in the verification of computer codes and models. A benchmark activity must be sufficiently documented so that its exact conditions can be reproduced. The experiment shall be as simple ("clean") as possible to allow exact modeling in the computer model. Experimental uncertainties shall be discussed and evaluated. Calculational benchmarks may be used in code intercomparisons provided that the code generating the benchmark data has been experimentally validated.
Benchmarking	Using a test problem, including input and output results, for verifying correct model operation or for comparing software.
Change control	An orderly management system for review and approval of computer code and software documentation changes.

Code	<ol style="list-style-type: none"> 1. A set of instructions written in any programming language to be acted upon by a computer. 2. The process of developing and writing the computer instructions.
Code custodian	A designated individual with responsibility for coordinating control of a computer code.
Computer program	A procedure that has been coded for a computer and designed for solving a problem, including such problems as collection and processing of data and presentation of results. (Source: letter to E. Bonano from K. Golliher, dated 9/26/84).
Configuration control	A management system for orderly control of software, including methods used for marking, controlling, and storing software and its associated documentation.
Data	<ol style="list-style-type: none"> 1. Representation of facts/concepts in a formalized manner suitable for communication, interpretation, or processing by human or automatic means. 2. Any representation, such as characters or analog quantities, to which meaning is or might be assigned. 3. Same as input data, numeric data, and output data.
Development	Design and construction of a software package, including mathematical models, associated computer programs, and specific calculations which has received peer review and management approval (i.e., the "Technical Reference Manual").
Engineering/ Scientific (i.e., Technical)	A computer code (or group of codes) which reads input data, computes results and provides a problem analysis. Engineering/scientific codes may be obtained from external sources or may result from the development process. Does not include computer system supported and widely used applications software such as LOTUS, RS/1, SAS, DISSPLA, or BMDP.
Hardware	Physical equipment for data processing, as opposed to the computer code or method of use.

Independent review	A technical review of a computer code by equally (or more) technically competent personnel who were not directly involved in the code's development. Reviewers may be members of the programmer's organization.
Input	Data, information, and instructions received by a computer.
Intercomparisons	When no suitable field or laboratory experiments are available to validate a computer model, computer code intercomparisons may be performed. Intercomparisons usually involve simplified model assumptions which can be exactly modeled and provide direct comparison of the results between two or more different computer codes and/or models.
Interface	A boundary, usually between hardware items, but which can be between software items (i.e., between subroutines and the main program), whereby information may be transferred.
Licensing activity	Any activity from which the data and/or conclusions may be used to support a construction or operation licensee application to the Nuclear Regulatory Commission (NRC).
Listing	A complete record of computer instructions, input and output - contained, used or generated by a computer code.
Mathematical model	A mathematical representation of a process or system.
Model	A representation of a system or process.
Modification	Changes made to computer codes and software documentation, or the product of such a change.
Minor code modifications	Changes to a code that do not affect the code's logic (e.g., change in array dimensions or to the input/output format).
Numerical model	A representation of a process or system using numerical methods.
Output	Computer results (e.g., answers to mathematical or statistical problems, analytical or accounting figures or production schedules). Information transferred from internal storage of a computer to external storage, or to any device

	<p>exterior to a computer (e.g., a printer). The device or collective set of devices used for taking data out of a device. A channel for expressing a state on a device or logic element. Intermediate results from computer code modules.</p>
Peer review	<p>A documented, fully traceable review performed by qualified (internal and/or external) personnel who are independent of the original work performed but who have the technical expertise to perform the work (i.e., peers). Peer reviews are in-depth, critical reviews and evaluations of project documents, material, or data that require interpretation of judgement to verify or validate results of conclusions; or when the conclusions, material, or data contained in the report go beyond the existing state of the art.</p>
Quality assurance of computer software	<p>Those planned and systematic actions necessary to provide adequate confidence that the software will serve its intended purpose.</p>
Retrievability	<p>The capability to access all previous versions of software developed over a reasonable period of time, even though they may not be executable due to hardware and/or system software changes.</p>
Revision	<p>An established, verified, and/or validated (and if appropriate, acceptance tested and approved) computer code or procedure as established under a configuration control method.</p>
Run	<p>The sequential operation of a computer code on one set of parameters/data/input until completion.</p>
Software	<ol style="list-style-type: none"> 1. All instructions which are input to a computer that cause it to function in any mode, which includes (1) operating systems, (2) supervisory systems, (3) compilers and (4) test routines. Software may also include software documentation. See also "Code Mathematical Model". 2. Written or printed data, e.g. (1) programs, (2) routines, (3) symbolic languages, and (4) control languages essential to the operation of computers.

Specifications	Documented statements intended to clearly and accurately describe essential features and requirements of a computer program.
Standardization	The standardization of computer codes is the degree to which the same or similar models and methods are employed to solve similar problems at different locations. The ultimate in standardization would be the use of the exact same models and programs at all sites. Standardization is necessary to the point that it is cost effective and results in accurate results for the different uses.
Test	A procedure that compares performance of a computer code to (1) specified technical, operational and performance requirements and (2) acceptance criteria.
Traceability	The ability to identify the actual configuration of the software used in the calculations. This characteristic is closely related to retrievability, which is described in detail above.
Transferability	Computer code transferability is the degree, and ease of which, a given computer code can be used on a variety of different computers. Computer codes should be designed for a maximum of transferability, which will entail standard computer languages and coding, to enable easy conversion to both other machines of the same type, as well as different types.
User	A person who operates the computer code. A person who uses results of the computer code's execution.
Users' guide	Documentation that supplies application information directed at the user and provides enough information to serve as a referral document for preparation of input data and interpretation of output.
Utility code	A computer code (or code segment) which may be easily verified and which performs a simple function, such as conversion of units, change in data format, or manipulation of graphics or database software.

Validation	In waste management applications, the object of validation is the assurance that the model embodied in a computer program is a correct representation of the process or system for which it is intended. Validation is generally accomplished by using computer programs to simulate field or laboratory experiments. For cases where these experiments are well defined, validation is possible. However, parameters that control experiments involving groundwater flow and contaminant transport (especially in fractured rock), are too poorly defined at this stage to allow for the validation of computer programs. In these cases, the exercise of applying the programs to field experiments is still a valuable test but falls short of "validation."
Verification	The process which demonstrates that the software correctly performs its stated capabilities. This is primarily done through a set of test problems designed to show that the stated equations are solved in a satisfactory manner, but not necessarily indicating that the model is a valid representation of any particular physical system. In addition, these problems can be used for familiarizing users with the function and execution of the computer program and providing a check between standard versions of the program on various computer systems.
Verification and/or validation plan	An approved method for verification and/or validation plan of a developed or changed computer code which identifies types of tests, inputs, sequence, documentation and criteria for the verification and/or validation process.
Version	A uniquely identified computer code product, based on an existing computer code, that usually has a significant new code or new function. Each version has its own documentation, testing and code listing and is the result of an approved computer code change.

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