

11.0 APPENDICES



Appendix A: Examples of ASCII Radioisotope Input Files

Example 1:

```
** NUTS TITLE **
'CONVECTION-DISPERSION-DECAY IN ONE DIMENSION PROBLEM TEST'
** 1.# OF SITES,# OF MATERIAL,(2.SITE NAME,# COMP. TO BE MODELED)1,...,NSITES **
1,2
'TEST4_SITE' 1
**(1. SITE, 2.COMP., DAUGHTER, PARENT, GROUP NAMES)1,...,NSITES **
'TEST4_SITE'
'COMP1' 'DAUGHT1' 'NONE' 'ELM1'
** 1.# OF ELEMENT,(2.ELEM. NAME, TEMP. DEPEND., TABLE LOOK-UP)1,...,NELEMENT **
1
'ELM1' .FALSE. .FALSE.
** COLLOIDAL TRANSPORT FLAG (T/F) **
.FALSE.
** PH DEPENDENT SOLUBILITY( IS PH REQUIRED (Y/N)) **
'N'
** METHOD ORDER,ONE-POINT=1,TWO-POINT=2,SPLIT-OPERATOR=3,MID-POINT=4 **
1
** DEGREE OF IMPLICITNESS **
1.
** IS MATRIX SORPTION REQUIRED (Y/N) **
'N'
** DO YOU HAVE DISPERSION IN THE MATRIX (Y/N) **
'Y'
** MATRIX SYMMETRIC DISPERSION AND DATA PROVIDED BY NUTS(T/F): ANSWER IF DISP.=Y **
.TRUE. .TRUE.
** DO YOU HAVE INJECTION/PRODUCTION IN THE MATRIX (Y/N) **
'N'
** DO YOU HAVE DIRICHLET B.CS. IN THE MATRIX (F/T) **
.TRUE.
** IS CONCENTRATION INITIALIZED MANUALLY IN THE MATRIX (F/T) **
.TRUE.
** MATRIX INITIAL.IN THE CDB FOR INTERPOLATED INTRUSION TIME IN E1 SCENARIO **
.FALSE.
** PRINT FLAGS OF MATRIX VARIABLES IN AN ASCII FILE**
0,0,0,0,0,0,1,0,0,0,0,0,0
** SPECIFIC RANGE OF DATA TO BE PRITED IN AN ASCII FILE **
'N'
** TEMP. DEPEND. OF Kd (ENTER DATA IF ADSORP. IS (Y) AND TEMP. DEPEND.) **
** TEMP. DEPEND.OF MOLECULAR DIFFUSION (ENTER DATA IF DISPER. IS (Y)) **
'COMP1' .FALSE.
** PRINTING FREQUENCY IN AN ASCII FILE **
1,1.E10
** DO YOU HAVE EXTERNAL NUCLIDE SOURCE? (T/F) **
.FALSE.
** MINIMUM LIMIT OF TIME TO BE SET IF ZERO ENCOUNTERED **
1.D-18
** IF CDB INITIAL., INTRUSION TIME, INTERPOLATED TIME, TOLERANCE IN SECONDS **
NUMBER OF TIMES FOR SPECIFYING MATERIAL MAP
1
START TIME FOR MAP 1
0.D0
MATERIAL TYPE GRID MAP
1 2 2 2 2 2 2 2 2 2
2 2 2 2 2 2 2 2 2 2
2 2 2 2 2 2 2 2 2 2
2 2 2 2 2 2 2 2 2 2
2 2 2 2 2 2 2 2 2 2
2 2 2 2 2 2 2 2 2 2
# NAME
1 REGION1
2 REGION2
NUMBER OF WASTE REGIONS
```

```
1
MAT_WASTE1
1
1
*** END MATERIAL MAP AND START NUCLIDES PROPERTIES ***
** IF NOT TEMP. DEPEND. (ELEMENT NAME, SOLUBILITY LIMIT) 1,...,NELEMENT **
'ELM1' 7
** (COMP. NAME, MOL. (ATOMIC) WT., INITIAL INVENTS., HALF LIFE)1,...,NUCLIDE **
'COMP1' 0.238 0.0 0.0 7.7016E12
** GROUND WATER PH INPUT **
** STANDARD BR. DENS. IF NOT BRAGFLO RUN ( ASCII FILE FOR FLUX FIELD) **
1000.
** MOLECULAR DIFFUSION OF EACH COMPONENT **
'COMP1' 1.E-9
** REFERENCE VISCOSITY AND TEMPERATURE **
** ROCK DENSITY INPUT **
** WASTE MATRIX INPUT **
1
'COMP1' 1 1
** (1.SITE NAME, # OF GRID IN THE SITE 2. INDECS), 1....,NSITES **
'TEST4_SITE' 1
1,1,1
** MATRIX SORPTION INPUT **
** MATRIX DISPERSION INPUT **
** MATRIX LONGITUDINAL MATERIAL DISPERSIVITIES **
10.0 10.0
** MATRIX TRANSVERSE MATERIAL DISPERSIVITIES **
0.0 0.0
** MATRIX MATERIAL TORTUOSITY **
10.0 10.0
** MATRIX SOURCE (INJECTION/PRODUCTION) INPUT IF ANY **
** MATRIX DIR. B.CS. (REP.='GENERAL, ANYWHERE='NOT_GENERAL') **
1 'GENERAL'
'COMP1' 1 1.0
** TIME DEPENDENT SOURCE IN THE MATRIX **
** MATRIX CONCENTRATION INITIALIZATION **
1
'COMP1' 1 1
1 1 1
'COMP1'
1.0
** COLLOID TRANSPORT VELOCITY SCALING FACTORS IN THE MATRIX **
```



Example 2:

```
** NUTS RUN TITLE **  
'2D TEST, ADVECTIVE IN X, DISPERSIVE IN X & Y, DECAY AND SORPTION, DT=5 Y'  
** 1.# OF SITES,# OF MATERIAL,(2.SITE NAME,# COMP. TO BE MODELED)1,...,NSITES **  
1,2  
'NMVP_SITE' 1  
** (1. SITE, 2. COMP., DAUGHTER, PARENT, GROUP NAMES)1,...,NSITES **  
'NMVP_SITE'  
'U234' 'DAUGHT1' 'NONE' 'U'  
** 1.# OF ELEMENT,(2.ELEM. NAME, TEMP. DEPEND., TABLE LOOK-UP)1,...,NELEMENT **  
1  
'U' .FALSE. .FALSE.  
** COLLOIDAL TRANSPORT FLAG (T/F) **  
.FALSE.  
** PH DEPENDENT SOLUBILITY( IS PH REQUIRED (Y/N)) **  
'N'  
** ORDER OF THE METHOD **  
1  
** DEGREE OF IMPLICITNESS **  
1.  
** IS MATRIX SORPTION REQUIRED (Y/N) **  
'Y'  
'L'  
'U234' 'ADSORP' .FALSE.  
** DO YOU HAVE DISPERSION IN THE MATRIX (Y/N) **  
'Y'  
** DOES MATRIX HAVE SYMMETRIC DISPERSION (T/F): ANSWER IF DISPERSION IS Y **  
.TRUE. .TRUE.  
** DO YOU HAVE INJECTION/PRODUCTION IN THE MATRIX (Y/N) **  
'N'  
** DO YOU HAVE DIRICHLET B.CS. IN THE MATRIX (F/T) **  
.TRUE.  
** IS CONCENTRATION INITIALIZED MANUALLY IN THE MATRIX (F/T) **  
.FALSE.  
** MATRIX INITIAL. IN THE CDB FOR INTERPOLATED INTRUSION TIME IN E1 SCENARIO **  
.FALSE.  
** PRINT FLAGS OF MATRIX VARIABLES IN AN ASCII FILE**  
0,0,0,0,0,0,1,0,0,0,0,0,0,0  
** SPECIFIC RANGE OF DATA TO BE PRITED IN AN ASCII FILE **  
'N'  
** TEMP. DEPEND. OF Kd (ENTER DATA IF ADSORP. IS (Y) AND TEMP. DEPEND.) **  
** TEMP. DEPEND. OF MOLECULAR DIFFUSION (ENTER DATA IF DISP. IS (Y)) **  
'U234' .FALSE.  
** PRINTING FREQUENCY IN AN ASCII FILE **  
200,1.E12  
** DO YOU HAVE EXTERNAL NUCLIDE SOURCE? (T/F) **  
.TRUE.  
** MINIMUM LIMIT OF TIME TO BE SET IF ZERO ENCOUNTERED **  
1.D-18  
** IF CDB INITIAL., INTRUSION TIME, INTERPOLATED TIME, TOLERANCE IN SECONDS **  
NUMBER OF TIMES FOR SPECIFING MATERIAL MAP  
1  
START TIME FOR MAP 1  
0.D0  
MATERIAL TYPE GRID MAP  
239*2 11*1 14*2 8*2 11*1 14*2 8*2 11*1 14*2 693*2  
# NAME  
1 REGION1  
2 REGION2  
NUMBER OF WASTE REGIONS  
1  
MAT_WASTE1  
1  
1  
*** END MATERIAL MAP AND START NUCLIDES PROPERTIES ***  
** IF NOT TEMP. DEPEND. (ELEMENT NAME, SOLUBILITY LIMIT) 1,...,NELEMENT **  
'U' 7  
** (COMP. NAME, MOL. (ATOMIC) WT., INITIAL INVENTS., HALF LIFE)1,...,NUCLIDE **  
'U234' 0.234 0.0 0.0 7.7156621D12
```

```
** GROUND WATER PH INPUT **
** STANDARD BR. DENS. IF NOT BRAGFLO RUN ( ASCII FILE FOR FLUX FIELD) **
1000.
** MOLECULAR DIFFUSION OF EACH COMPONENT **
'U234' 2.7D-10
** REFERENCE VISCOSITY AND TEMPERATURE **
** ROCK DENSITY INPUT **
2500.0 2500.0
** WASTE MATRIX INPUT **
1
'U234' 1 1
** (1. SITE NAME, # OF GRID IN THE SITE, 2. INDECS), 1.....NSITES **
'NMVP_SITE' 33
9,8,1 10,8,1 11,8,1 12,8,1 13,8,1
14,8,1 15,8,1 16,8,1 17,8,1 18,8,1
19,8,1
9,9,1 10,9,1 11,9,1 12,9,1 13,9,1
14,9,1 15,9,1 16,9,1 17,9,1 18,9,1
19,9,1
9,10,1 10,10,1 11,10,1 12,10,1 13,10,1
14,10,1 15,10,1 16,10,1 17,10,1 18,10,1
19,10,1
** MATRIX SORPTION INPUT **
'U234'
2.222222222D-5 2.222222222D-5
** MATRIX DISPERSION INPUT **
** MATRIX LONGITUDINAL MATERIAL DISPERSIVITIES **
100.0 100.0
** MATRIX TRANSVERSE MATERIAL DISPERSIVITIES **
5.0 5.0
** MATRIX MATERIAL TORTOUSITY **
10.0 10.0
** MATRIX SOURCE (INJECTION/PRODUCTION) INPUT IF ANY **
** MATRIX DIR. B.CS. (REP.='GENERAL, ANYWHERE='NOT_GENERAL') **
1 'NOT_GENERAL'
'U234' 1 128
33,1,1 33,2,1 33,3,1 33,4,1 33,5,1
33,6,1 33,7,1 33,8,1 33,9,1 33,10,1
33,11,1 33,12,1 33,13,1 33,14,1 33,15,1
33,16,1 33,17,1 33,18,1 33,19,1 33,20,1
33,21,1 33,22,1 33,23,1 33,24,1 33,25,1
33,26,1 33,27,1 33,28,1 33,29,1 33,30,1
33,31,1
1,31,1 2,31,1 3,31,1 4,31,1 5,31,1
6,31,1 7,31,1 8,31,1 9,31,1 10,31,1
11,31,1 12,31,1 13,31,1 14,31,1 15,31,1
16,31,1 17,31,1 18,31,1 19,31,1 20,31,1
21,31,1 22,31,1 23,31,1 24,31,1 25,31,1
26,31,1 27,31,1 28,31,1 29,31,1 30,31,1
31,31,1 32,31,1 33,31,1
1,1,1 1,2,1 1,3,1 1,4,1 1,5,1
1,6,1 1,7,1 1,8,1 1,9,1 1,10,1
1,11,1 1,12,1 1,13,1 1,14,1 1,15,1
1,16,1 1,17,1 1,18,1 1,19,1 1,20,1
1,21,1 1,22,1 1,23,1 1,24,1 1,25,1
1,26,1 1,27,1 1,28,1 1,29,1 1,30,1
1,31,1
1,1,1 2,1,1 3,1,1 4,1,1 5,1,1
6,1,1 7,1,1 8,1,1 9,1,1 10,1,1
11,1,1 12,1,1 13,1,1 14,1,1 15,1,1
16,1,1 17,1,1 18,1,1 19,1,1 20,1,1
21,1,1 22,1,1 23,1,1 24,1,1 25,1,1
26,1,1 27,1,1 28,1,1 29,1,1 30,1,1
31,1,1 32,1,1 33,1,1
'U234'
0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0.
```

0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

** TIME DEPENDENT SOURCE IN THE MATRIX ****

1

'U234' 1 33

9,8,1 10,8,1 11,8,1 12,8,1 13,8,1

14,8,1 15,8,1 16,8,1 17,8,1 18,8,1

19,8,1

9,9,1 10,9,1 11,9,1 12,9,1 13,9,1

14,9,1 15,9,1 16,9,1 17,9,1 18,9,1

19,9,1

9,10,1 10,10,1 11,10,1 12,10,1 13,10,1

14,10,1 15,10,1 16,10,1 17,10,1 18,10,1

19,10,1

'U234'

0.27579693E-10 0.62967336E-11 0.12593467E-11 0.25186934E-12

0.12593467E-11 0.62967336E-11 0.27579693E-10 0.25186934E-10

0.62967336E-10 0.31168831E-09 0.62967336E-10 0.27579693E-10

0.62967336E-11 0.12593467E-11 0.25186934E-12 0.12593467E-11

0.62967336E-11 0.27579693E-10 0.25186934E-10 0.62967336E-10

0.31168831E-09 0.62967336E-10 0.27579693E-10 0.62967336E-11

0.12593467E-11 0.25186934E-12 0.12593467E-11 0.62967336E-11

0.27579693E-10 0.25186934E-10 0.62967336E-10 0.31168831E-09

0.62967336E-10

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38

0.D0 0.3156D10 0.3156D10 1.D38 1.D38



Example 3:

```
** NUTS TITLE **  
'NUTS TRACER TEST FOR E01_DOWN SENARIO'  
** 1.# OF SITES,# OF MATERIAL, (2.SITE NAME,# COMP. TO BE MODELED)1,...,NSITES **  
1,38  
'WIPP_SITE' 2  
** (1. SITE, 2.COMP., DAUGHTER, PARENT, GROUP NAMES)1,...,NSITES **  
'WIPP_SITE'  
'WASTE#1' 'NONE' 'NONE' 'WASTE'  
'CASTL#1' 'NONE' 'NONE' 'CASTL'  
** 1.# OF ELEMENT, (2.ELEM. NAME, TEMP. DEPEND., TABLE LOOK-UP)1,...,NELEMENT **  
2  
'WASTE' .FALSE. .FALSE.  
'CASTL' .FALSE. .FALSE.  
** COLLOIDAL TRANSPORT FLAG (T/F) **  
.FALSE.  
** PH DEPENDENT SOLUBILITY (IS PH REQUIRED (Y/N)) **  
'N'  
** ORDER OF THE METHOD ***  
1  
** DEGREE OF IMPLICITNESS **  
1.  
** IS MATRIX SORPTION REQUIRED (Y/N) **  
'N'  
** DO YOU HAVE DISPERSION IN THE MATRIX (Y/N) **  
'N'  
** DOES MATRIX HAVE SYMMETRIC DISPERSION (T/F): ANSWER IF DISPERSION IS Y **  
** DO YOU HAVE INJECTION/PRODUCTION IN THE MATRIX (Y/N) **  
'N'  
** DO YOU HAVE DIRICHLET B.CS. IN THE MATRIX (F/T) **  
.TRUE.  
** IS CONCENTRATION INITIALIZED MANUALLY IN THE MATRIX (F/T) **  
.FALSE.  
** MATRIX INITIAL. IN THE CDB FOR INTERPOLATED INTRUSION TIME IN E1 SCENARIO **  
.FALSE.  
** PRINT FLAGS OF MATRIX VARIABLES IN A BINARY FILE **  
0,0,0,0,0,0,1,0,0,0,0,0,0,0  
** TEMP. DEPEND. OF Rd (ENTER DATA IF ADSORP. IS (Y) AND TEMP. DEPEND.) **  
** PRINTING FREQUENCY IN A BINARY FILE **  
1,12  
** DO YOU HAVE EXTERNAL NUCLIDE SOURCE? (T/F) **  
.FALSE.  
** MINIMUM LIMIT OF TIME TO BE SET IF ZERO ENCOUNTERED **  
1.D-18  
** IF CDB INITIAL., INTRUSION TIME, INTERPOLATED TIME, TOLERANCE IN SECONDS **  
*** END MATERIAL MAP AND START NUCLIDES PROPERTIES ***  
** IF NOT TEMP. DEPEND. (ELEMENT NAME, SOLUBILITY LIMIT) 1,...,NELEMENT **  
'WASTE' 1.  
'CASTL' 1.  
** (COMP. NAME, MOL.(ATOMIC) WT., INITIAL INVENTS., HALF LIFE)1,...,NUCLIDE **  
'WASTE#1' .1 0. 0. 0.  
'CASTL#1' .1 0. 0. 0.  
** GROUND WATER PH INPUT **  
** STANDARD BR. DENS. IF NOT BRAGFLO RUN (READ ASCII FILE FOR FLUX FIELD) **  
** MOLECULAR DIFFUSION OF EACH COMPONENT **  
** ROCK DENSITY INPUT **  
** WASTE MATRIX INPUT (LOCATION OF THE WASTE) **  
1  
'WASTE#1' 1 1  
** (1. SITE_NAME, # OF THE GRID IN THE SITE, 2. INDECES ),1,...,NSITES **  
'WIPP_SITE' 30  
8,8,1 9,8,1 10,8,1 12,8,1 13,8,1 14,8,1 15,8,1 16,8,1  
17,8,1 18,8,1 8,9,1 9,9,1 10,9,1 12,9,1 13,9,1 14,9,1  
15,9,1 16,9,1 17,9,1 18,9,1 8,10,1 9,10,1 10,10,1 12,10,1  
13,10,1 14,10,1 15,10,1 16,10,1 17,10,1 18,10,1  
** MATRIX SORPTION INPUT **  
** MATRIX DISPERSION INPUT **  
** MATRIX SOURCE INPUT (INJECTED NUCLIDES IF ANY) **  
** MATRIX DIR. B.CS. INPUT (REP.='GENERAL',ANYWHERE='NOT_GENERAL') **
```

```
2 'NOT_GENERAL'  
'WASTE#1' 1 30  
 8,8,1 9,8,1 10,8,1 12,8,1 13,8,1 14,8,1 15,8,1 16,8,1  
17,8,1 18,8,1 8,9,1 9,9,1 10,9,1 12,9,1 13,9,1 14,9,1  
15,9,1 16,9,1 17,9,1 18,9,1 8,10,1 9,10,1 10,10,1 12,10,1  
13,10,1 14,10,1 15,10,1 16,10,1 17,10,1 18,10,1  
'CASTL#1' 2 27  
 3,1,1 4,1,1 5,1,1 6,1,1 7,1,1 8,1,1 9,1,1  
10,1,1 11,1,1 12,1,1 13,1,1 14,1,1 15,1,1 16,1,1  
17,1,1 18,1,1 19,1,1 20,1,1 21,1,1 22,1,1 23,1,1  
24,1,1 25,1,1 26,1,1 27,1,1 28,1,1 29,1,1  
'WASTE#1'  
 1. 1. 1. 1. 1. 1. 1. 1.  
 1. 1. 1. 1. 1. 1. 1. 1.  
 1. 1. 1. 1. 1. 1. 1. 1.  
'CASL#1'  
 1. 1. 1. 1. 1. 1. 1. 1.  
 1. 1. 1. 1. 1. 1. 1. 1.  
 1. 1. 1. 1. 1. 1.  
** TIME DEPENDENT SOURCE IN THE MATRIX **  
** MATRIX CONCENTRATION INITIALIZATION **  
** COLLOID TRANSPORT VELOCITY SCALING FACTORS IN THE MATRIX **
```


Example 4:

```
** NUTS TITLE **
'1D TEST, ADVEC. AND DISP. IN X, 3 MEMBER DECAY AND SORPTION'
** 1.# OF SITES,# OF MATERIAL, (2:SITE NAME,# COMP. TO BE MODELED)1,...,NSITES **
1,2
'CHAIN_SITE' 3
**(1. SITE, 2.COMP., DAUGHTER, PARENT, GROUP NAMES)1,...,NSITES **
'CHAIN_SITE'
'ISOL' 'DAUGHT1' 'NONE' 'EL1'
'DAUGHT1' 'DAUGHT2' 'ISOL' 'EL1'
'DAUGHT2' 'DAUGHT3' 'DAUGHT1' 'EL1'
** 1.# OF ELEMENT, (2.ELEM. NAME, TEMP. DEPEND., TABLE LOOK-UP)1,...,NELEMENT **
1
'EL1' .FALSE. .FALSE.
** COLLOIDAL TRANSPORT FLAG (T/F) **
.FALSE.
** PH DEPENDENT SOLUBILITY( IS PH REQUIRED (Y/N)) **
'N'
***** ORDER OF THE METHOD *****
1
***** DEGREE OF IMPLICITNESS *****
1.D0
** IS MATRIX SORPTION REQUIRED (Y/N) **
'Y'
'L'
'ISOL' 'ADSORP' .FALSE.
'DAUGHT1' 'ADSORP' .FALSE.
'DAUGHT2' 'ADSORP' .FALSE.
** DO YOU HAVE DISPERSION IN THE MATRIX (Y/N) **
'Y'
** DOES MATRIX HAVE SYMMETRIC & NUTS DISPER. (T/F): ANSWER IF DISPER.IS Y **
.TRUE. .TRUE.
** DO YOU HAVE INJECTION/PRODUCTION IN THE MATRIX (Y/N) **
'N'
** DO YOU HAVE DIRICHLET B.CS. IN THE MATRIX (F/T) **
.TRUE.
** IS CONCENTRATION INITIALIZED MANUALLY IN THE MATRIX (F/T) **
.TRUE.
** MATRIX INITIAL. IN THE CDB FOR INTERPOLATED INTRUSION TIME IN E1 SCENARIO **
.FALSE.
** PRINT FLAGS OF MATRIX VARIABLES IN AN ASCII FILE**
0,0,0,0,0,0,1,0,0,0,0,0,0,0
** SPECIFIC RANGE OF DATA TO BE PRITED IN AN ASCII FILE **
'N'
** TEMP. DEPEND. OF Kd (ENTER DATA IF ADSORP. IS (Y) AND TEMP. DEPEND.) **
** TEMP. DEPEND. OF MOLECULAR DIFFUSION (ENTER DATA IF DISP. IS (Y)) **
'ISOL' .FALSE.
'DAUGHT1' .FALSE.
'DAUGHT2' .FALSE.
** PRINTING FREQUENCY IN AN ASCII FILE **
25,1.D12
** DO YOU HAVE EXTERNAL NUCLIDE SOURCE? (T/F) **
.FALSE.
** MINIMUM LIMIT OF TIME TO BE SET IF ZERO ENCOUNTERED **
1.D-18
** IF CDB INITIAL., INTRUSION TIME, INTERPOLATED TIME, TOLERANCE IN SECONDS **
NUMBER OF TIMES FOR SPECIFYING MATERIAL MAP
1
START TIME FOR MAP 1
0.D0
MATERIAL TYPE GRID MAP
1*1 76*2
# NAME
1 FORM1
2 FORM2
NUMBER OF WASTE REGIONS
1
MAT_WASTE1
```



```
1
1
*** END MATERIAL MAP AND START NUCLIDES PROPERTIES ***
IF NOT TEMP. DEPEND. (ELEMENT NAME, SOLUBILITY LIMIT) 1,...,NELEMENT **
'EL1' 7.D0
** (COMP. NAME, MOL. (ATOMIC) WT., INITIAL INVENTS., HALF LIFE) 1,...,NUCLIDE **
'ISO1' 0.1D0 0.D0 0.D0 1.366548D10
'DAUGHT1' 0.1D0 0.D0 0.D0 4.734000D8
'DAUGHT2' 0.1D0 0.D0 0.D0 2.064024D11
** GROUND WATER PH INPUT **
** STANDARD BR. DENS. IF NOT BRAGFLO RUN ( ASCII FILE FOR FLUX FIELD) **
1000.D0
** MOLECULAR DIFFUSION OF EACH COMPONENT **
'ISO1' 0.D0
'DAUGHT1' 0.D0
'DAUGHT2' 0.D0
** REFERENCE VISCOSITY AND TEMPERATURE **
** ROCK DENSITY INPUT **
1.11111111D0 1.11111111D0
** WASTE MATRIX INPUT **
3
'ISO' 1 1
'DAUGHT1' 2 1
'DAUGHT2' 3 1
**(1.SITE NAME, # OF GRID IN THE SITE 2. INDECES OF THE BLOCKS)1...NSITES **
'CHAIN_SITE' 1
1,1,1
** MATRIX SORPTION INPUT **
'ISO1'
935.1D0 935.1D0
'DAUGHT1'
7793.233D0 7793.233D0
'DAUGHT2'
311.633D0 311.633D0
** MATRIX DISPERSION INPUT **
** MATRIX LONGITUDINAL MATERIAL DISPERSIVITIES **
2.5908D0 2.5908D0
** MATRIX TRANSVERSE MATERIAL DISPERSIVITIES **
0.0D0 0.0D0
** MATRIX MATERIAL TORTOUSITY **
10.0D0 10.0D0
** MATRIX SOURCE (INJECTION/PRODUCTION) INPUT IF ANY **
** MATRIX DIR. B.C.S. (REP.='GENERAL, ANYWHERE='NOT_GENERAL') **
3 'NOT_GENERAL'
'ISO1' 1 2
1,1,1 77,1,1
'DAUGHT1' 2 2
1,1,1 77,1,1
'DAUGHT2' 3 2
1,1,1 77,1,1
'ISO1'
1.D0 0.D0
'DAUGHT1'
0.01D0 0.D0
'DAUGHT2'
0.004D0 0.D0
** TIME DEPENDENT SOURCE IN THE MATRIX ****
** MATRIX CONCENTRATION INITIALIZATION **
3
'ISO1' 1 1
1,1,1
'DAUGHT1' 1 1
1,1,1
'DAUGHT2' 1 1
1,1,1
'ISO1'
1.D0
'DAUGHT1'
0.01D0
'DAUGHT2'
```



0.004D0

** COLLOID TRANSPORT VELOCITY SCALING FACTORS IN THE MATRIX **



Example 5:

```
** NUTS TITLE **
'1D TEST, FOR PRECIPITATION AND PREFERENTIAL COLLOID SOLUBILITY'
** 1.# OF SITES, # OF MATERIAL, (2.SITE NAME, # COMP. TO BE MODELED)1,...,NSITES **
1,2
'SRC_SITE' 2
** (1. SITE, 2.COMP., DAUGHTER, PARENT, GROUP NAMES)1,...,NSITES **
'SRC_SITE'
'SOLUBLE1' 'NONE' 'NONE' 'ELSOL1'
'COLLOID1' 'NONE' 'NONE' 'ELCOL1'
** 1.# OF ELEMENT, (2.ELEM. NAME, TEMP. DEPEND., TABLE LOOK-UP)1,...,NELEMENT **
2
'ELSOL1' .FALSE. .FALSE.
'ELCOL1' .FALSE. .FALSE.
** COLLOIDAL TRANSPORT FLAG (T/F) **
.TRUE.
**1. # OF COLLOIDS, (2. LOC. COLLOID,3. LOC OF THE RELATED DISS)1...NCOLLOID **
1
2
1
.TRUE.
** PH DEPENDENT SOLUBILITY( IS PH REQUIRED (Y/N)) **
'N'
***** ORDER OF THE METHOD *****
1
***** DEGREE OF IMPLICITNESS *****
1.
** IS MATRIX SORPTION REQUIRED (Y/N) **
'N'
** DO YOU HAVE DISPERSION IN THE MATRIX (Y/N) **
'N'
** DISPERSION IS SYMMETRIC (T/F), INPUT FROM NUTS (T/F) ***
** DO YOU HAVE INJECTION/PRODUCTION IN THE MATRIX (Y/N) **
'N'
** DO YOU HAVE DIRICHLET B.CS. IN THE MATRIX (F/T) **
.TRUE.
** MATIRX INITIAL. IN THE CDB FOR INTERPOLATED INTURSION TIME IN E1 SCENARIO **
.FALSE.
** IS CONCENTRATION INITIALIZED MANUALLY IN THE MATRIX (F/T) **
.FALSE.
** PRINT FLAGS OF MATRIX VARIABLES IN AN ASCII FILE**
0,0,0,0,0,0,0,1,1,0,0,0,0
** SPECIFIC RANGE OF DATA TO BE PRITED IN AN ASCII FILE **
'N'
** TEMP. DEPEND. OF Kd (ENTER DATA IF ADSORP. IS (Y) AND TEMP. DEPEND.) **
** PRINTING FREQUENCY IN AN ASCII FILE **
1,1.E12
** DO YOU HAVE EXTERNAL NUCLIDE SOURCE? (T/F) **
.FALSE.
** MINIMUM LIMIT OF TIME TO BE SET IF ZERO ENCOUNTERED **
1.D-18
** IF CDB INITIAL., INTRUSION TIME, INTERPOLATED TIME, TOLERANCE IN SECONDS **
NUMBER OF TIMES FOR SPECIFYING MATERIAL MAP
1
START TIME FOR MAP 1
0.D0
MATERIAL TYPE GRID MAP
1*2 1*1 1*2
# NAME
1 REPOS
2 LEFTRIGHT
NUMBER OF WASTE REGIONS
1
MAT_WASTE1
1
1
*** END MATERIAL MAP AND START NUCLIDES PROPERTIES ***
** IF NOT TEMP. DEPEND. (ELEMENT NAME, SOLUBILITY LIMIT) 1,...,NELEMENT **
'ELSOL1' 1.D0
```

```
'ELCOL1'      0.9542425D0
** (COMP. NAME, MOL. (ATOMIC) WT., INITIAL INVENTS., HALF LIFE)1,...,NUCLIDE **
'SOLUBLE1'    0.1  1.1578947  0.  0.
'COLLOID1'    0.1  1.0421053  0.  0.
** GROUND WATER PH INPUT **
** STANDARD BR. DENS. IF NOT BRAGFLO RUN ( ASCII FILE FOR FLUX FIELD) **
1000.
** MOLECULAR DIFFUSION OF EACH COMPONENT **
** ROCK DENSITY INPUT **
** WASTE MATRIX INPUT **
2
'SOLUBLE1'    1      1
'COLLOID1'    2      1
** (1. SITE NAME, # OF GRID 2. INDECES OF WASTE MATRIX)1....NSITE **
'NMVP_SITE'   1
2,1,1
** MATRIX SORPTION INPUT **
** MATRIX DISPERSION INPUT **
** MATRIX SOURCE (INJECTION/PRODUCTION) INPUT IF ANY **
** MATRIX DIR. B.CS. (REP.='GENERAL, ANYWHERE='NOT_GENERAL') **
2 'NOT_GENERAL'
'SOLUBLE1'    1      1
3,1,1
'COLLOID1'    2      1
3,1,1
'SOLUBLE1'
0.
'COLLOID1'
0.
** TIME DEPENDENT SOURCE IN THE MATRIX ****
** MATRIX CONCENTRATION INITIALIZATION **
** COLLOID TRANSPORT VELOCITY SCALING FACTORS IN THE MATRIX **
** SCALING FACTORS IN X-DIRECTION **
1.  1.  1.
** SCALING FACTORS IN Y-DIRECTION **
1.  1.  1.
** SCALING FACTORS IN Z-DIRECTION **
1.  1.  1.
```

