

## TOUGH Short Course

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### Selected Input and Output Files for EOS7R Problem

- Files for Part A: *MatDist.txt*
- Files for Part B: *MakeMesh.txt, MESH\_1D, MESH\_2D, MESH\_MatNum*
- Files for Part C: *SimInit.txt, SimInit.out, SAVE\_SimInit, SimInit\_Flow.txt*
- Files for Part D: *SimRad1\_Flow.txt*
- Files for Part E: *SimRad2\_1.txt, SimRad2\_2.txt, SimRad2\_2.out*

#### Part A (MatDist.txt)

```
*RADIONUCLIDE TRANSPORT PROBLEM*
ROCKS-----1-----2-----3-----4-----5-----6-----7-----8
CLAY      2      2650.      .12  1.00E-17  1.00E-17  1.00E-17      2.5      905.5
          1.83e-9  3.47e-5      .12  1.00E-17  1.00E-17  1.00E-17  1.00E-00  1.00E-03
          7          0.4          0.5          1.0          0.05
          7          0.4          0.5          5.6e-7          1.0
CONTA     2      2650.      .17  1.00E-17  1.00E-17  1.00E-17      52.0      905.5
          1.83e-9  3.47e-5      .17  1.00E-17  1.00E-17  1.00E-17  1.00E-00  1.00E-03
          7          0.4          0.3          1.0          0.05
          7          0.4          0.3          1.E-5          1.0
BENTO     2      2650.      .40  1.00E-20  1.00E-20  1.00E-20      1.35      964.0
          3.58e-9  1.5e-5      .40  1.00E-20  1.00E-20  1.00E-20  1.00E-00  1.00E-03
          7          0.4          0.3          1.0          0.05
          7          0.4          0.3          5.6e-9          1.0
TOPBC     2      2650.      .12  1.00E-17  1.00E-17  1.00E-17      2.5      905.5
          1.83e-9  3.47e-5      .12  1.00E-17  1.00E-17  1.00E-17  1.00E-00  1.00E-03
          7          0.4          0.5          1.0          0.05
          7          0.4          0.5          5.6e-7          1.0
BOTBC     2      2650.      .12  1.00E-17  1.00E-17  1.00E-17      2.5      905.5
          1.83e-9  3.47e-5      .12  1.00E-17  1.00E-17  1.00E-17  1.00E-00  1.00E-03
          7          0.4          0.5          1.0          0.05
          7          0.4          0.5          5.6e-7          1.0

MULTI-----1-----2-----3-----4-----5-----6-----7-----8
? ? 2 8
START-----1-----2-----3-----4-----5-----6-----7-----8
-----1 MOP: 123456789*123456789*1234 -----5-----6-----7-----8
PARAM-----1-----2-----3-----4-----5-----6-----7-----8
39999 99991 4 5
          1.0e-1          9.8
1.E-05 1.E+0
          5.00E6          0.0          0.0          0.0
          25.0
```

```

SELEC---1---*---2---*---3---*---4---*---5---*---6---*---7---*---8
      6      1      24      2
      -1.e5

      0.e-0      0.e-1
      0.e-9      0.e-9      1.e-5      0.0e-9      0.e-9      1.e-11
      1.0e1      1.0      0.e-6      1.162e-9      1.e+30
      1.0e1      1.0      0.e-6      1.162e-9      1.e+30

GENER---1---*---2---*---3---*---4---*---5---*---6---*---7---*---8

INCON---1---*---2---*---3---*---4---*---5---*---6---*---7---*---8

*****
Add ELEM and CONNE blocks here
*****

ENDCY

*****
When needed, move the INDOM block given below to below GENER block
*****

INDOM---1---*---2---*---3---*---4---*---5---*---6---*---7---*---8
?????      0.12000086E+00
0.50000000000000E+07 0.00000000000000E-00 0.00000000000000E+00 0.00000000000000E+00
0.25000000000000E+02

```

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## Part B (MESH\_1D)

```

ELEME
A11 1      10.1000E+000.2000E+00      0.5000E-010.5000E+00-.5000E+00
A11 2      10.1000E+000.2000E+00      0.1500E+000.5000E+00-.5000E+00
A11 3      10.1000E+000.2000E+00      0.2500E+000.5000E+00-.5000E+00
A11 4      10.1000E+000.2000E+00      0.3500E+000.5000E+00-.5000E+00
A11 5      10.1000E+000.2000E+00      0.4500E+000.5000E+00-.5000E+00
A11 6      10.1000E+000.2000E+00      0.5500E+000.5000E+00-.5000E+00
A11 7      10.1000E+000.2000E+00      0.6500E+000.5000E+00-.5000E+00
A11 8      10.1000E+000.2000E+00      0.7500E+000.5000E+00-.5000E+00
A11 9      10.1000E+000.2000E+00      0.8500E+000.5000E+00-.5000E+00
A1110      10.1000E+000.2000E+00      0.9500E+000.5000E+00-.5000E+00
A1111      10.1000E+000.2000E+00      0.1050E+010.5000E+00-.5000E+00
A1112      10.1000E+000.2000E+00      0.1150E+010.5000E+00-.5000E+00
A1113      10.1000E+000.2000E+00      0.1250E+010.5000E+00-.5000E+00
A1114      10.1000E+000.2000E+00      0.1350E+010.5000E+00-.5000E+00
A1115      10.1000E+000.2000E+00      0.1450E+010.5000E+00-.5000E+00
A1116      10.2000E+000.4000E+00      0.1600E+010.5000E+00-.5000E+00
A1117      10.2000E+000.4000E+00      0.1800E+010.5000E+00-.5000E+00
A1118      10.2000E+000.4000E+00      0.2000E+010.5000E+00-.5000E+00
A1119      10.2000E+000.4000E+00      0.2200E+010.5000E+00-.5000E+00
A1120      10.2000E+000.4000E+00      0.2400E+010.5000E+00-.5000E+00
A1121      10.4000E+000.8000E+00      0.2700E+010.5000E+00-.5000E+00
A1122      10.4000E+000.8000E+00      0.3100E+010.5000E+00-.5000E+00
A1123      10.4000E+000.8000E+00      0.3500E+010.5000E+00-.5000E+00
A1124      10.4000E+000.8000E+00      0.3900E+010.5000E+00-.5000E+00
A1125      10.4000E+000.8000E+00      0.4300E+010.5000E+00-.5000E+00

CONNE
A11 1A11 2      10.5000E-010.5000E-010.1000E+01
A11 2A11 3      10.5000E-010.5000E-010.1000E+01
A11 3A11 4      10.5000E-010.5000E-010.1000E+01
A11 4A11 5      10.5000E-010.5000E-010.1000E+01
A11 5A11 6      10.5000E-010.5000E-010.1000E+01
...

```

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A11 6A11 7	10.5000E-010.5000E-010.1000E+01
A11 7A11 8	10.5000E-010.5000E-010.1000E+01
A11 8A11 9	10.5000E-010.5000E-010.1000E+01
A11 9A1110	10.5000E-010.5000E-010.1000E+01
A1110A1111	10.5000E-010.5000E-010.1000E+01
A1111A1112	10.5000E-010.5000E-010.1000E+01
A1112A1113	10.5000E-010.5000E-010.1000E+01
A1113A1114	10.5000E-010.5000E-010.1000E+01
A1114A1115	10.5000E-010.5000E-010.1000E+01
A1115A1116	10.5000E-010.1000E+000.1000E+01
A1116A1117	10.1000E+000.1000E+000.1000E+01
A1117A1118	10.1000E+000.1000E+000.1000E+01
A1118A1119	10.1000E+000.1000E+000.1000E+01
A1119A1120	10.1000E+000.1000E+000.1000E+01
A1120A1121	10.1000E+000.2000E+000.1000E+01
A1121A1122	10.2000E+000.2000E+000.1000E+01
A1122A1123	10.2000E+000.2000E+000.1000E+01
A1123A1124	10.2000E+000.2000E+000.1000E+01
A1124A1125	10.2000E+000.2000E+000.1000E+01

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## Part B (MESH\_2D)

ELEME		
A11 1	10.4000E-010.1000E+00	0.5000E-010.5000E+00-.2000E+00
A21 1	10.4000E-010.0000E+00	0.5000E-010.5000E+00-.6000E+00
A31 1	10.4000E-010.0000E+00	0.5000E-010.5000E+00-.1000E+01
A41 1	10.4000E-010.0000E+00	0.5000E-010.5000E+00-.1400E+01
A51 1	10.4000E-010.0000E+00	0.5000E-010.5000E+00-.1800E+01
A61 1	10.2000E-010.0000E+00	0.5000E-010.5000E+00-.2100E+01
A71 1	10.2000E-010.0000E+00	0.5000E-010.5000E+00-.2300E+01
A81 1	10.2000E-010.0000E+00	0.5000E-010.5000E+00-.2500E+01
A91 1	10.2000E-010.0000E+00	0.5000E-010.5000E+00-.2700E+01
AA1 1	10.2000E-010.0000E+00	0.5000E-010.5000E+00-.2900E+01
AB1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.3050E+01
AC1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.3150E+01
AD1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.3250E+01
AE1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.3350E+01
AF1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.3450E+01
AG1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.3550E+01
AH1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.3650E+01
AI1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.3750E+01
AJ1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.3850E+01
AK1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.3950E+01
AL1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.4050E+01
AM1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.4150E+01
AN1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.4250E+01
AO1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.4350E+01
AP1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.4450E+01
AQ1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.4550E+01
AR1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.4650E+01
AS1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.4750E+01
AT1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.4850E+01
AU1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.4950E+01
AV1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.5050E+01
AW1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.5150E+01

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AX1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.5250E+01
AY1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.5350E+01
AZ1 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.5450E+01
B11 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.5550E+01
B21 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.5650E+01
B31 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.5750E+01
B41 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.5850E+01
B51 1	10.1000E-010.0000E+00	0.5000E-010.5000E+00-.5950E+01
B61 1	10.2000E-010.0000E+00	0.5000E-010.5000E+00-.6100E+01
B71 1	10.2000E-010.0000E+00	0.5000E-010.5000E+00-.6300E+01
B81 1	10.2000E-010.0000E+00	0.5000E-010.5000E+00-.6500E+01
B91 1	10.2000E-010.0000E+00	0.5000E-010.5000E+00-.6700E+01
BA1 1	10.2000E-010.0000E+00	0.5000E-010.5000E+00-.6900E+01
BB1 1	10.4000E-010.0000E+00	0.5000E-010.5000E+00-.7200E+01
BC1 1	10.4000E-010.0000E+00	0.5000E-010.5000E+00-.7600E+01
BD1 1	10.4000E-010.0000E+00	0.5000E-010.5000E+00-.8000E+01
BE1 1	10.4000E-010.0000E+00	0.5000E-010.5000E+00-.8400E+01
BF1 1	10.4000E-010.1000E+00	0.5000E-010.5000E+00-.8800E+01
A11 2	10.4000E-010.1000E+00	0.1500E+000.5000E+00-.2000E+00
A21 2	10.4000E-010.0000E+00	0.1500E+000.5000E+00-.6000E+00
A31 2	10.4000E-010.0000E+00	0.1500E+000.5000E+00-.1000E+01
A41 2	10.4000E-010.0000E+00	0.1500E+000.5000E+00-.1400E+01
A51 2	10.4000E-010.0000E+00	0.1500E+000.5000E+00-.1800E+01
A61 2	10.2000E-010.0000E+00	0.1500E+000.5000E+00-.2100E+01
A71 2	10.2000E-010.0000E+00	0.1500E+000.5000E+00-.2300E+01
A81 2	10.2000E-010.0000E+00	0.1500E+000.5000E+00-.2500E+01
A91 2	10.2000E-010.0000E+00	0.1500E+000.5000E+00-.2700E+01
AA1 2	10.2000E-010.0000E+00	0.1500E+000.5000E+00-.2900E+01
AB1 2	10.1000E-010.0000E+00	0.1500E+000.5000E+00-.3050E+01
AC1 2	10.1000E-010.0000E+00	0.1500E+000.5000E+00-.3150E+01
AD1 2	10.1000E-010.0000E+00	0.1500E+000.5000E+00-.3250E+01
AE1 2	10.1000E-010.0000E+00	0.1500E+000.5000E+00-.3350E+01
AF1 2	10.1000E-010.0000E+00	0.1500E+000.5000E+00-.3450E+01
AG1 2	10.1000E-010.0000E+00	0.1500E+000.5000E+00-.3550E+01
AH1 2	10.1000E-010.0000E+00	0.1500E+000.5000E+00-.3650E+01
AI1 2	10.1000E-010.0000E+00	0.1500E+000.5000E+00-.3750E+01

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...		
BB125	10.1600E+000.0000E+00	0.4300E+010.5000E+00-.7200E+01
BC125	10.1600E+000.0000E+00	0.4300E+010.5000E+00-.7600E+01
BD125	10.1600E+000.0000E+00	0.4300E+010.5000E+00-.8000E+01
BE125	10.1600E+000.0000E+00	0.4300E+010.5000E+00-.8400E+01
BF125	10.1600E+000.4000E+00	0.4300E+010.5000E+00-.8800E+01
CONNE		
A11 1A11 2	10.5000E-010.5000E-010.4000E+00	
A11 1A21 1	30.2000E+000.2000E+000.1000E+000.1000E+01	
A21 1A21 2	10.5000E-010.5000E-010.4000E+00	
A21 1A31 1	30.2000E+000.2000E+000.1000E+000.1000E+01	
A31 1A31 2	10.5000E-010.5000E-010.4000E+00	
A31 1A41 1	30.2000E+000.2000E+000.1000E+000.1000E+01	
A41 1A41 2	10.5000E-010.5000E-010.4000E+00	
A41 1A51 1	30.2000E+000.2000E+000.1000E+000.1000E+01	
A51 1A51 2	10.5000E-010.5000E-010.4000E+00	
A51 1A61 1	30.2000E+000.1000E+000.1000E+000.1000E+01	
A61 1A61 2	10.5000E-010.5000E-010.2000E+00	
A61 1A71 1	30.1000E+000.1000E+000.1000E+000.1000E+01	
A71 1A71 2	10.5000E-010.5000E-010.2000E+00	
A71 1A81 1	30.1000E+000.1000E+000.1000E+000.1000E+01	
A81 1A81 2	10.5000E-010.5000E-010.2000E+00	
A81 1A91 1	30.1000E+000.1000E+000.1000E+000.1000E+01	
A91 1A91 2	10.5000E-010.5000E-010.2000E+00	
A91 1AA1 1	30.1000E+000.1000E+000.1000E+000.1000E+01	
AA1 1AA1 2	10.5000E-010.5000E-010.2000E+00	
AA1 1AB1 1	30.1000E+000.5000E-010.1000E+000.1000E+01	
AB1 1AB1 2	10.5000E-010.5000E-010.1000E+00	
AB1 1AC1 1	30.5000E-010.5000E-010.1000E+000.1000E+01	
AC1 1AC1 2	10.5000E-010.5000E-010.1000E+00	
AC1 1AD1 1	30.5000E-010.5000E-010.1000E+000.1000E+01	
AD1 1AD1 2	10.5000E-010.5000E-010.1000E+00	
AD1 1AE1 1	30.5000E-010.5000E-010.1000E+000.1000E+01	
AE1 1AE1 2	10.5000E-010.5000E-010.1000E+00	
...		

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## Part C (SimInit.txt)

```

*RADIONUCLIDE TRANSPORT PROBLEM*
ROCKS-----1-----2-----3-----4-----5-----6-----7-----8
CLAY      2      2650.      .12 1.00E-17 1.00E-17 1.00E-17 2.5 905.5
          1.83e-9 3.47e-5      1. 1.00e-00 1.00E-03
          7      0.4      0.5 1.0 0.05
          7      0.4      0.5 5.6e-7 1.0
CONTA     2      2650.      .17 1.00E-17 1.00E-17 1.00E-17 52.0 905.5
          1.83e-9 3.47e-5      1. 1.00e-00 1.00E-03
          7      0.4      0.3 1. 0.05
          7      0.4      0.3 1.E-5 1.0
BENTO     2      2650.      .40 1.00E-20 1.00E-20 1.00E-20 1.35 964.0
          3.58e-9 1.5e-5      1. 1.00e-00 1.00E-03
          7      0.4      0.3 1. 0.05
          7      0.4      0.3 5.6e-9 1.0
TOPBC     2      2650.      .12 1.00E-17 1.00E-17 1.00E-17 2.5 905.5
          1.83e-9 3.47e-5      1. 1.00e-00 1.00E-03
          7      0.4      0.5 1. 0.05
          7      0.4      0.5 5.6e-7 1.0
BOTBC     2      2650.      .12 1.00E-17 1.00E-17 1.00E-17 2.5 905.5
          1.83e-9 3.47e-5      1. 1.00e-00 1.00E-03
          7      0.4      0.5 1. 0.05
          7      0.4      0.5 5.6e-7 1.0

MULTI-----1-----2-----3-----4-----5-----6-----7-----8
          4      4      2      8
START-----1-----2-----3-----4-----5-----6-----7-----8
-----1 MOP: 123456789*123456789*1234 -----5-----6-----7-----8
PARAM-----1-----2-----3-----4-----5-----6-----7-----8
          39999 99991      4      5
                  1.0e+3      9.8
          1.E-05      1.E+0
                  6.37E6      0.0      0.0      0.0
                  25.0

```

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```

SELEC-----1-----2-----3-----4-----5-----6-----7-----8
          6      1      24      2
          -1.e5

          0.e-0      0.e-1
          0.e-9      0.e-9      1.e-5      0.0e-9      0.e-9      1.e-11
          1.0e1      1.0      0.e-6      1.162e-9      1.e+30
          1.0e1      1.0      0.e-6      1.162e-9      1.e+30

GENER-----1-----2-----3-----4-----5-----6-----7-----8

INDOM-----1-----2-----3-----4-----5-----6-----7-----8
TOPBC      0.12000086E+00
0.637000000000000E+07 1.000000000000000E-03 0.000000000000000E+00 0.000000000000000E+00
0.250000000000000E+02

INCON-----1-----2-----3-----4-----5-----6-----7-----8

ELEM
A21 1      10.4000E-010.0000E+00      0.5000E-010.5000E+00-.6000E+00
...
A1123      40.1600E+000.4000E+00      0.3500E+010.5000E+00-.2000E+00
A1124      40.1600E+000.4000E+00      0.3900E+010.5000E+00-.2000E+00
A1125      40.1600E+000.4000E+00      0.4300E+010.5000E+00-.2000E+00
ina
BF1 1      50.4000E-010.1000E+00      0.5000E-010.5000E+00-.8800E+01
BF1 2      50.4000E-010.1000E+00      0.1500E+000.5000E+00-.8800E+01
BF1 3      50.4000E-010.1000E+00      0.2500E+000.5000E+00-.8800E+01
...
BF123      50.1600E+000.4000E+00      0.3500E+010.5000E+00-.8800E+01
BF124      50.1600E+000.4000E+00      0.3900E+010.5000E+00-.8800E+01
BF125      50.1600E+000.4000E+00      0.4300E+010.5000E+00-.8800E+01

CONNE
A11 1A11 2      10.5000E-010.5000E-010.4000E+00
A11 1A21 1      30.2000E+000.2000E+000.1000E+000.1000E+01
...

```

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[illegible]

```
*****
*****
***** TOUGH2 - VERSION 2.0 (OCTOBER 1999) *****
***** T2CG2 Solver Package *****
*****
*****
```

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MNEL = 12000    MNCON = 25000    MNEQ = 4    MNK = 3    MNPH = 3    MNB = 8    MNOGN = 300    MGTAB = 2000

[illegible]

```
*****
* EOS7R: EQUATION OF STATE FOR MIXTURES OF WATER/BRINE/RADIONUCLIDE(1)/RADIONUCLIDE(2)/AIR *
*****
OPTIONS SELECTED ARE: (NK,NRO,NPH,NR,NKIN) = (4,4,2,8,4)
```

OPTIONS SELECTED ARE: (NK, NEO, NPH, NB, NKIN) = (4, 4, 2, 8, 4)

```

NK      = 4  - NUMBER OF COMPONENTS
NEQ     = 4  - NUMBER OF EQUATIONS PER GRID BLOCK
NPH     = 2  - NUMBER OF PHASES THAT CAN BE PRESENT
NB      = 8  - NUMBER OF SECONDARY PARAMETERS (OTHER THAN' COMPONENT MASS FRACTIONS)
NKIN    = 4  - number of components for initializing thermodynamic conditions (default is NKIN = NK)

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For NB = 6, diffusion is "off", for NB = 8, diffusion is "on"

AVAILABLE OPTIONS for (NK,NEQ,NPH,NB) :

NO	LOI	NR	NR2	NR3	NR4	NR5	NR6	NR7	NR8	NR9	NR10	NR11	NR12	NR13	NR14	NR15	NR16	NR17	NR18	NR19	NR20	NR21	NR22	NR23	NR24	NR25	NR26	NR27	NR28	NR29	NR30	NR31	NR32	NR33	NR34	NR35	NR36	NR37	NR38	NR39	NR40	NR41	NR42	NR43	NR44	NR45	NR46	NR47	NR48	NR49	NR50	NR51	NR52	NR53	NR54	NR55	NR56	NR57	NR58	NR59	NR60	NR61	NR62	NR63	NR64	NR65	NR66	NR67	NR68	NR69	NR70	NR71	NR72	NR73	NR74	NR75	NR76	NR77	NR78	NR79	NR80	NR81	NR82	NR83	NR84	NR85	NR86	NR87	NR88	NR89	NR90	NR91	NR92	NR93	NR94	NR95	NR96	NR97	NR98	NR99	NR100	NR101	NR102	NR103	NR104	NR105	NR106	NR107	NR108	NR109	NR110	NR111	NR112	NR113	NR114	NR115	NR116	NR117	NR118	NR119	NR120	NR121	NR122	NR123	NR124	NR125	NR126	NR127	NR128	NR129	NR130	NR131	NR132	NR133	NR134	NR135	NR136	NR137	NR138	NR139	NR140	NR141	NR142	NR143	NR144	NR145	NR146	NR147	NR148	NR149	NR150	NR151	NR152	NR153	NR154	NR155	NR156	NR157	NR158	NR159	NR160	NR161	NR162	NR163	NR164	NR165	NR166	NR167	NR168	NR169	NR170	NR171	NR172	NR173	NR174	NR175	NR176	NR177	NR178	NR179	NR180	NR181	NR182	NR183	NR184	NR185	NR186	NR187	NR188	NR189	NR190	NR191	NR192	NR193	NR194	NR195	NR196	NR197	NR198	NR199	NR200	NR201	NR202	NR203	NR204	NR205	NR206	NR207	NR208	NR209	NR210	NR211	NR212	NR213	NR214	NR215	NR216	NR217	NR218	NR219	NR220	NR221	NR222	NR223	NR224	NR225	NR226	NR227	NR228	NR229	NR230	NR231	NR232	NR233	NR234	NR235	NR236	NR237	NR238	NR239	NR240	NR241	NR242	NR243	NR244	NR245	NR246	NR247	NR248	NR249	NR250	NR251	NR252	NR253	NR254	NR255	NR256	NR257	NR258	NR259	NR260	NR261	NR262	NR263	NR264	NR265	NR266	NR267	NR268	NR269	NR270	NR271	NR272	NR273	NR274	NR275	NR276	NR277	NR278	NR279	NR280	NR281	NR282	NR283	NR284	NR285	NR286	NR287	NR288	NR289	NR290	NR291	NR292	NR293	NR294	NR295	NR296	NR297	NR298	NR299	NR300	NR301	NR302	NR303	NR304	NR305	NR306	NR307	NR308	NR309	NR310	NR311	NR312	NR313	NR314	NR315	NR316	NR317	NR318	NR319	NR320	NR321	NR322	NR323	NR324	NR325	NR326	NR327	NR328	NR329	NR330	NR331	NR332	NR333	NR334	NR335	NR336	NR337	NR338	NR339	NR340	NR341	NR342	NR343	NR344	NR345	NR346	NR347	NR348	NR349	NR350	NR351	NR352	NR353	NR354	NR355	NR356	NR357	NR358	NR359	NR360	NR361	NR362	NR363	NR364	NR365	NR366	NR367	NR368	NR369	NR370	NR371	NR372	NR373	NR374	NR375	NR376	NR377	NR378	NR379	NR380	NR381	NR382	NR383	NR384	NR385	NR386	NR387	NR388	NR389	NR390	NR391	NR392	NR393	NR394	NR395	NR396	NR397	NR398	NR399	NR400	NR401	NR402	NR403	NR404	NR405	NR406	NR407	NR408	NR409	NR410	NR411	NR412	NR413	NR414	NR415	NR416	NR417	NR418
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NKIN = NK or NKIN = NK-2. Default options are (5,5,2,8) - isothermal, diffusion "on", NKIN=NK

THE NK = 4 ("NO AIR") OPTIONS MAY ONLY BE USED FOR PROBLEMS WITH SINGLE-PHASE LIQUID CONDITIONS THROUGHOUT.

THE NORMAL NUMBER OF SECONDARY PARAMETERS OTHER THAN MASS FRACTIONS IS 6 PER PHASE. IN EOS7R, WE OPTIONALLY ADD TO THIS A SATURATION-DEPENDENT TORTUOSITY FOR EACH PHASE, AS WELL AS TEMPERATURE AND PRESSURE DEPENDENCE OF THE DIFFUSION COEFFICIENT.

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NKIN = 4    *** ALLOWS INITIALIZATION WITH DIFFERENT SETS OF PRIMARY VARIABLES. ***
            *** THIS IS USEFUL FOR STARTING EOS7R SIMULATIONS FROM EOS7 INITIAL CONDITIONS. ***
            = NK (default): (P,XB,XRN1,XRN2,XAIR,T) FOR SINGLE PHASE, (P,XB,XRN1,XRN2,S+10,T) FOR TWO-PHASE. (EOS7R FORMAT).
            = NK-2: (P,XB,XAIR,T) FOR SINGLE PHASE, (P,XB,S+10,T) FOR TWO-PHASE. (EOS7 FORMAT). WILL INITIALIZE XRN1 = XRN2 = 0.

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THE PRIMARY VARIABLES ARE

P - PRESSURE    T - TEMPERATURE    XB - BRINE MASS FRACTION IN LIQUID (FOR SINGLE-PHASE GAS, XB IS BRINE MASS FRACTION IN GAS)

XRN1 - MASS FRACTION IN THE LIQUID OF RADIONUCLIDE(1) (PARENT)    XRN2 - MASS FRACTION IN THE LIQUID OF RADIONUCLIDE(2) (DAUGHTER)

S+10. - (GAS PHASE SATURATION + 10.)    X - AIR MASS FRACTION    T - TEMPERATURE

COMPONENTS		FLUID PHASE CONDITION	PRIMARY VARIABLES
# 1 - WATER		SINGLE-PHASE GAS (#)	P, XB, XRN1, XRN2, X, T
# 2 - BRINE		SINGLE-PHASE LIQUID (*)	P, XB, XRN1, XRN2, X, T
# 3 - RN1		TWO-PHASE (*)	P, XB, XRN1, XRN2, S10., T

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*      # 4 - RM2      *
*
*      # 5 - AIR      *
*
*      # 6 - HEAT     *
*
*****
NEGATIVE REFERENCE PRESSURE OF -.100000E+06 PA WAS SPECIFIED, THUS BRINE PROPERTIES ARE IDENTICAL TO WATER FOR ALL SALINITIES.

PROPERTIES OF THE RADIONUCLIDES:  DOMAIN  RADIONUCLIDE(1)  RADIONUCLIDE(2)
HALF-LIFE (SECONDS):  -ALL-  0.1000E+02  0.1000E+02
MOLECULAR WEIGHT (GM/MOLE):  -ALL-  0.1000E+01  0.1000E+01
INVERSE HENRY CONST. (MOLE/PA):  -ALL-  0.1000E+31  0.1000E+31
GAS PHASE DIFFUSIVITY (M**2/S):  -ALL-  0.0000E+00  0.0000E+00
AQ. PHASE DIFFUSIVITY (M**2/S):  -ALL-  0.1162E-08  0.1162E-08
DISTRIBUTION COEFF. (M**3/KG):  CLAY  0.1000E+01  0.1000E-02
DISTRIBUTION COEFF. (M**3/KG):  CONTA  0.1000E+01  0.1000E-02
DISTRIBUTION COEFF. (M**3/KG):  BENTO  0.1000E+01  0.1000E-02
DISTRIBUTION COEFF. (M**3/KG):  TOPBC  0.1000E+01  0.1000E-02
DISTRIBUTION COEFF. (M**3/KG):  BOTBC  0.1000E+01  0.1000E-02

MOLECULAR DIFFUSIVITY OF WATER, BRINE, XRN1, XRN2, AND AIR THROUGH THE GASEOUS AND AQUEOUS PHASES, (PDDIAG(PHASE,COMP)) [M**2/S]:
PHASE 1 = GAS; PHASE 2 = AQUEOUS
PHASE COMP PHASE COMP PHASE COMP PHASE COMP PHASE COMP PHASE COMP PHASE COMP PHASE COMP PHASE COMP
-1- -1- -2- -1- -3- -1- -4- -2- -3- -2- -4- -2- -5-
0.00000E+00 0.00000E+00 0.00000E+00 0.00000E+00 0.10000E-04 0.00000E+00 0.00000E+00 0.11620E-08 0.11620E-08 0.10000E-10

***** VOLUME- AND MASS-BALANCES *****
***** [KCYC,ITER] = [ 0, 0] ***** THE TIME IS 0.000000E+00 SECONDS, OR 0.000000E+00 DAYS

PHASES PRESENT
PHASES * GAS AQUEOUS
*****
VOLUME (M**3) * 0.00000000E+00 0.50890000E+01
MASS (KG) * 0.00000000E+00 0.50887579E+04
*****

COMPONENT MASS IN PLACE (KG)
PHASES * GAS AQUEOUS ADSORBED TOTAL
*****
COMPONENTS *
WATER * 0.00000000E+00 0.50836691E+04 0.00000000E+00 0.50836691E+04
BRINE * 0.00000000E+00 0.50887579E+01 0.00000000E+00 0.50887579E+01
RNI * 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
RN2 * 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
AIR * 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
*****

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B11 1( 1, 1) ST = 0.100000E+04 DT = 0.100000E+04 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6370000. S = 0.000000E+00
...ITERATING... AT [ 2, 1] --- DELTEX = 0.200000E+04 MAX. RES. = 0.183322E-04 AT ELEMENT B11 1 EQUATION 1
A11 5( 2, 2) ST = 0.300000E+04 DT = 0.200000E+04 DX1= -.123165E+04 DX2= 0.453532E-15 T = 25.000 P = 6368768. S = 0.000000E+00
...ITERATING... AT [ 3, 1] --- DELTEX = 0.400000E+04 MAX. RES. = 0.191969E-04 AT ELEMENT A11 5 EQUATION 1
A11 5( 3, 2) ST = 0.700000E+04 DT = 0.400000E+04 DX1= -.690683E+02 DX2= 0.861142E-17 T = 25.000 P = 6369962. S = 0.000000E+00
...ITERATING... AT [ 4, 1] --- DELTEX = 0.800000E+04 MAX. RES. = 0.115009E-04 AT ELEMENT A11 1 EQUATION 1
B11 9( 4, 2) ST = 0.150000E+05 DT = 0.800000E+04 DX1= 0.270776E+04 DX2= -.147725E-14 T = 25.000 P = 6376189. S = 0.000000E+00
...ITERATING... AT [ 5, 1] --- DELTEX = 0.160000E+05 MAX. RES. = 0.160060E-04 AT ELEMENT A11 1 EQUATION 1
A11 11( 5, 2) ST = 0.310000E+05 DT = 0.160000E+05 DX1= 0.716526E+02 DX2= -.422539E-17 T = 25.000 P = 6379047. S = 0.000000E+00
...ITERATING... AT [ 6, 1] --- DELTEX = 0.320000E+05 MAX. RES. = 0.193227E-04 AT ELEMENT A11 1 EQUATION 1
...ITERATING... AT [ 6, 2] --- DELTEX = 0.320000E+05 MAX. RES. = 0.126633E-03 AT ELEMENT A111 EQUATION 1

...

A11 5( 14, 2) ST = 0.163830E+08 DT = 0.819200E+07 DX1= 0.116491E+05 DX2= -.220528E-13 T = 25.000 P = 6394748. S = 0.000000E+00
...ITERATING... AT [ 15, 1] --- DELTEX = 0.163840E+08 MAX. RES. = 0.974024E-04 AT ELEMENT A11 6 EQUATION 1
A11 3( 15, 2) ST = 0.327670E+08 DT = 0.163840E+08 DX1= 0.114330E+05 DX2= 0.149596E-13 T = 25.000 P = 6399323. S = 0.000000E+00
...ITERATING... AT [ 16, 1] --- DELTEX = 0.327680E+08 MAX. RES. = 0.906829E-04 AT ELEMENT A11 1 EQUATION 1
A11 4( 16, 2) ST = 0.655350E+08 DT = 0.327680E+08 DX1= 0.670248E+04 DX2= 0.822382E-15 T = 25.000 P = 6411904. S = 0.000000E+00
...ITERATING... AT [ 17, 1] --- DELTEX = 0.655360E+08 MAX. RES. = 0.523781E-04 AT ELEMENT A11 1 EQUATION 1
A11 5( 17, 2) ST = 0.131071E+09 DT = 0.655360E+08 DX1= 0.223860E+04 DX2= 0.639965E-15 T = 25.000 P = 6412183. S = 0.000000E+00
...ITERATING... AT [ 18, 1] --- DELTEX = 0.131072E+09 MAX. RES. = 0.174030E-04 AT ELEMENT A11 1 EQUATION 1
A11 4( 18, 2) ST = 0.262143E+09 DT = 0.131072E+09 DX1= 0.405375E+03 DX2= 0.123361E-14 T = 25.000 P = 6414548. S = 0.000000E+00
A11 1( 19, 1) ST = 0.524287E+09 DT = 0.262143E+09 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6417489. S = 0.000000E+00
A11 1( 20, 1) ST = 0.104858E+10 DT = 0.524288E+09 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6417489. S = 0.000000E+00
...ITERATING... AT [ 21, 1] --- DELTEX = 0.104858E+10 MAX. RES. = 0.125835E-04 AT ELEMENT A11 1 EQUATION 1
A11 4( 21, 2) ST = 0.209715E+10 DT = 0.104858E+10 DX1= 0.398066E+02 DX2= -.421017E-16 T = 25.000 P = 6408708. S = 0.000000E+00
A11 1( 22, 1) ST = 0.419430E+10 DT = 0.209715E+10 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6417528. S = 0.000000E+00
A11 1( 23, 1) ST = 0.838861E+10 DT = 0.419430E+10 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6417528. S = 0.000000E+00
A11 1( 24, 1) ST = 0.167772E+11 DT = 0.838861E+10 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6417528. S = 0.000000E+00
A11 1( 25, 1) ST = 0.335544E+11 DT = 0.167772E+11 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6417528. S = 0.000000E+00
A11 1( 26, 1) ST = 0.671089E+11 DT = 0.335544E+11 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6417528. S = 0.000000E+00
A11 1( 27, 1) ST = 0.134218E+12 DT = 0.671089E+11 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6417528. S = 0.000000E+00
...ITERATING... AT [ 28, 1] --- DELTEX = 0.134218E+12 MAX. RES. = 0.197603E-04 AT ELEMENT A11 1 EQUATION 1
A11 2( 28, 2) ST = 0.268435E+12 DT = 0.134218E+12 DX1= 0.494625E+00 DX2= 0.944114E-18 T = 25.000 P = 6414588. S = 0.000000E+00
A11 2( 29, 1) ST = 0.536871E+12 DT = 0.268435E+12 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6414588. S = 0.000000E+00
A11 2( 30, 1) ST = 0.107374E+13 DT = 0.536871E+12 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6414588. S = 0.000000E+00
A11 2( 31, 1) ST = 0.214748E+13 DT = 0.107374E+13 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6414588. S = 0.000000E+00
A11 2( 32, 1) ST = 0.429497E+13 DT = 0.214748E+13 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6414588. S = 0.000000E+00
A11 2( 33, 1) ST = 0.858993E+13 DT = 0.429497E+13 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6414588. S = 0.000000E+00
A11 2( 34, 1) ST = 0.171799E+14 DT = 0.858993E+13 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6414588. S = 0.000000E+00
A11 2( 35, 1) ST = 0.343597E+14 DT = 0.171799E+14 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6414588. S = 0.000000E+00
A11 2( 36, 1) ST = 0.687195E+14 DT = 0.343597E+14 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6414588. S = 0.000000E+00
A11 2( 37, 1) ST = 0.137439E+15 DT = 0.687195E+14 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6414588. S = 0.000000E+00
***** FOR 10 CONSECUTIVE TIME STEPS HAVE CONVERGENCE ON ITER = 1
WRITE OUT CURRENT DATA, THEN STOP EXECUTION
A11 2( 38, 1) ST = 0.274878E+15 DT = 0.137439E+15 DX1= 0.000000E+00 DX2= 0.000000E+00 T = 25.000 P = 6414588. S = 0.000000E+00

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TOTAL TIME	KCYC	ITER	ITERC	KON	DX1M	DX2M	DX3M	MAX. RES.	NER	KER	DELTEX
0.274878E+15	38	1	62	2	0.000000E+00	0.000000E+00	0.000000E+00	0.94287E-05	75	1	0.13744E+15

ITEM	INDEX	T	SL	XBRNE (LIQ)	XRN1 (LIQ)	XRN2 (LIQ)	XAIRG	XRN1 (GAS)	XRN2 (GAS)	DL
	(PA)	(DEG-C)								(KG/M**3)
A21	1	0.63739E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99995E+03
A21	2	0.63739E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99995E+03
A41	1	0.63875E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99995E+03
A41	2	0.63875E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99995E+03
A61	1	5.63886E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E+03
A61	2	5.63886E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E+03
A81	1	6.93965E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E+03
A81	2	6.93965E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E+03
A81	3	6.93965E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E+03
A81	4	6.93965E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E+03
A81	5	6.93965E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E+03
AC1	1	10.93989E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AC1	2	10.93989E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AD1	1	14.60418E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AD1	2	14.60418E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AF1	1	16.64028E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AF1	2	16.64028E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AH1	1	16.64038E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AH1	2	16.64038E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AK1	1	17.64048E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AK1	2	17.64048E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AK1	3	19.60677E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AL1	1	20.64077E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AL1	2	20.64077E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AM1	1	22.64097E+07	0.2500E+02	0.1000E+01	0.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E+03
AM1	2	22.64097E+07	0.2							

ITEM	INDEX	T	SL	XNRINE (LIQ)	XRN1 (LIQ)	XRN2 (LIQ)	XAIRG	XRN1 (GAS)	XRN2 (GAS)	DL
	(PA)	(DEG-C)								(KG/M**3)
B31	1	37	0.64244E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99998E-03
B41	1	38	0.64244E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99998E-03
B51	1	39	0.64263E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99998E-03
B61	1	40	0.64278E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99998E-03
B71	1	41	0.64298E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99998E-03
B81	1	42	0.64313E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99998E-03
B91	1	43	0.64337E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99998E-03
BA1	1	44	0.64357E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99998E-03
BB1	1	45	0.64386E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99998E-03
BC1	1	46	0.64425E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99998E-03
BD1	1	47	0.64464E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99998E-03
BE1	1	48	0.64504E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99999E-03
A21	2	49	0.64739E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99995E-03
A31	2	50	0.63778E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E-03
A41	2	51	0.63818E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E-03
A51	2	52	0.63857E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E-03
A61	2	53	0.63886E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E-03
A71	2	54	0.63906E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E-03
A81	2	55	0.63925E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E-03
A91	2	56	0.63945E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E-03
AA1	2	57	0.63964E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E-03
AB1	2	58	0.63979E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99996E-03
AC1	2	59	0.63989E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E-03
AD1	2	60	0.63999E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E-03
AE1	2	61	0.64004E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E-03
AF1	2	62	0.64013E+07	0.25000E+02	0.10000E+01	0.10000E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.99997E-03
AG1	2	63	0.6							



## Part C (SAVE\_SimInit)

```
INCON -- INITIAL CONDITIONS FOR 1251 ELEMENTS AT TIME 0.274878E+15
A21 1 0.12000086E+00
0.6373919816909E+07 0.9999999999992E-03 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A31 1 0.12000172E+00
0.6377839640616E+07 0.10000000000002E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A41 1 0.12000258E+00
0.6381759471120E+07 0.99999999999907E-03 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A51 1 0.12000344E+00
0.6385679308422E+07 0.99999999999967E-03 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A61 1 0.12000409E+00
0.6388619190859E+07 0.99999999999961E-03 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A71 1 0.12000452E+00
0.6390579114608E+07 0.10000000000003E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A81 1 0.12000495E+00
0.6392539040057E+07 0.99999999999972E-03 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A91 1 0.12000538E+00
0.6394498967204E+07 0.10000000000008E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
...
BE1 1 0.12001765E+00
0.6450357605269E+07 0.10000000000038E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A21 2 0.12000086E+00
0.6373919816909E+07 0.10000000000001E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
...
```

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```
...
BF122 0.12001851E+00
0.6454277561522E+07 0.10000000000005E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
BF123 0.12001851E+00
0.6454277561522E+07 0.100000000000042E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
BF124 0.12001851E+00
0.6454277561522E+07 0.99999999999972E-03 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
BF125 0.12001851E+00
0.6454277561522E+07 0.100000000000024E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
ina 0 0.12000000E+00
0.6370000000000E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A11 1 0.12000000E+00
0.6370000000000E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A11 2 0.12000000E+00
0.6370000000000E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
...
A1123 0.12000000E+00
0.6370000000000E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A1124 0.12000000E+00
0.6370000000000E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
A1125 0.12000000E+00
0.6370000000000E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
0.250000000000E+02
+++
38 62 5 0.00000000E+00 0.27487791E+15
```

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## Part C (SimInit\_Flow.txt)

```

*RADIONUCLIDE TRANSPORT PROBLEM*
ROCKS-----1-----2-----3-----4-----5-----6-----7-----8
CLAY      2      2650.      .12  1.00E-17  1.00E-17  1.00E-17  2.5      905.5
          1.83e-9  3.47e-5          1.      1.00e-00  1.00E-03
          7      0.4          0.5      1.0      0.05
          7      0.4          0.5      5.6e-7          1.0
CONTA     2      2650.      .17  1.00E-17  1.00E-17  1.00E-17  52.0      905.5
          1.83e-9  3.47e-5          1.      1.00e-00  1.00E-03
          7      0.4          0.3      1.      0.05
          7      0.4          0.3      1.E-5          1.0
BENTO     2      2650.      .40  1.00E-20  1.00E-20  1.00E-20  1.35      964.0
          3.58e-9  1.5e-5          1.      1.00e-00  1.00E-03
          7      0.4          0.3      1.      0.05
          7      0.4          0.3      5.6e-9          1.0
TOPBC     2      2650.      .12  1.00E-17  1.00E-17  1.00E-17  2.5      905.5
          1.83e-9  3.47e-5          1.      1.00e-00  1.00E-03
          7      0.4          0.5      1.      0.05
          7      0.4          0.5      5.6e-7          1.0
BOTBC     2      2650.      .12  1.00E-17  1.00E-17  1.00E-17  2.5      905.5
          1.83e-9  3.47e-5          1.      1.00e-00  1.00E-03
          7      0.4          0.5      1.      0.05
          7      0.4          0.5      5.6e-7          1.0

MULTI-----1-----2-----3-----4-----5-----6-----7-----8
          4      4      2      8
START-----1-----2-----3-----4-----5-----6-----7-----8
-----1 MOP: 123456789*123456789*1234 -----5-----6-----7-----8
PARAM-----1-----2-----3-----4-----5-----6-----7-----8
          39999      99991          4      5
                  1.0e+3          9.8
          1.E-05          1.E+0
                  6.37E6          0.0          0.0          0.0
                  25.0

```

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```

SELEC-----1-----2-----3-----4-----5-----6-----7-----8
          6      1      24      2
          -1.e5

          0.e-0      0.e-1
          0.e-9      0.e-9      1.e-5      0.0e-9      0.e-9      1.e-11
          1.0e1      1.0      0.e-6      1.162e-9          1.e+30
          1.0e1      1.0      0.e-6      1.162e-9          1.e+30

GENER-----1-----2-----3-----4-----5-----6-----7-----8

INDOM-----1-----2-----3-----4-----5-----6-----7-----8
TOPBC          0.12000086E+00
          0.6370000000000E+07  1.000000000000E-03  0.000000000000E+00  0.000000000000E+00
          0.250000000000E+02
BOTBC          0.12000086E+00
          0.630000000000E+07  1.000000000000E-03  0.000000000000E+00  0.000000000000E+00
          0.250000000000E+02

INCON-----1-----2-----3-----4-----5-----6-----7-----8

ELEM
A21 1          10.4000E-010.0000E+00          0.5000E-010.5000E+00-.6000E+00
...
ina
BF1 1          50.4000E-010.1000E+00          0.5000E-010.5000E+00-.8800E+01
BF1 2          50.4000E-010.1000E+00          0.1500E+000.5000E+00-.8800E+01
BF1 3          50.4000E-010.1000E+00          0.2500E+000.5000E+00-.8800E+01
BF1 4          50.4000E-010.1000E+00          0.3500E+000.5000E+00-.8800E+01
BF1 5          50.4000E-010.1000E+00          0.4500E+000.5000E+00-.8800E+01
BF1 6          50.4000E-010.1000E+00          0.5500E+000.5000E+00-.8800E+01
BF1 7          50.4000E-010.1000E+00          0.6500E+000.5000E+00-.8800E+01
BF1 8          50.4000E-010.1000E+00          0.7500E+000.5000E+00-.8800E+01
BF1 9          50.4000E-010.1000E+00          0.8500E+000.5000E+00-.8800E+01
BF110          50.4000E-010.1000E+00          0.9500E+000.5000E+00-.8800E+01
BF111          50.4000E-010.1000E+00          0.1050E+010.5000E+00-.8800E+01
BF112          50.4000E-010.1000E+00          0.1150E+010.5000E+00-.8800E+01
BF113          50.4000E-010.1000E+00          0.1250E+010.5000E+00-.8800E+01

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BF114	50.4000E-010.1000E+00	0.1350E+010.5000E+00-.8800E+01
BF115	50.4000E-010.1000E+00	0.1450E+010.5000E+00-.8800E+01
BF116	50.8000E-010.2000E+00	0.1600E+010.5000E+00-.8800E+01
BF117	50.8000E-010.2000E+00	0.1800E+010.5000E+00-.8800E+01
BF118	50.8000E-010.2000E+00	0.2000E+010.5000E+00-.8800E+01
BF119	50.8000E-010.2000E+00	0.2200E+010.5000E+00-.8800E+01
BF120	50.8000E-010.2000E+00	0.2400E+010.5000E+00-.8800E+01
BF121	50.1600E+000.4000E+00	0.2700E+010.5000E+00-.8800E+01
BF122	50.1600E+000.4000E+00	0.3100E+010.5000E+00-.8800E+01
BF123	50.1600E+000.4000E+00	0.3500E+010.5000E+00-.8800E+01
BF124	50.1600E+000.4000E+00	0.3900E+010.5000E+00-.8800E+01
BF125	50.1600E+000.4000E+00	0.4300E+010.5000E+00-.8800E+01
A11 1	40.4000E-010.1000E+00	0.5000E-010.5000E+00-.2000E+00
A11 2	40.4000E-010.1000E+00	0.1500E+000.5000E+00-.2000E+00
A11 3	40.4000E-010.1000E+00	0.2500E+000.5000E+00-.2000E+00
A11 4	40.4000E-010.1000E+00	0.3500E+000.5000E+00-.2000E+00
A11 5	40.4000E-010.1000E+00	0.4500E+000.5000E+00-.2000E+00
A11 6	40.4000E-010.1000E+00	0.5500E+000.5000E+00-.2000E+00
A11 7	40.4000E-010.1000E+00	0.6500E+000.5000E+00-.2000E+00
A11 8	40.4000E-010.1000E+00	0.7500E+000.5000E+00-.2000E+00
A11 9	40.4000E-010.1000E+00	0.8500E+000.5000E+00-.2000E+00
A1110	40.4000E-010.1000E+00	0.9500E+000.5000E+00-.2000E+00
A1111	40.4000E-010.1000E+00	0.1050E+010.5000E+00-.2000E+00
A1112	40.4000E-010.1000E+00	0.1150E+010.5000E+00-.2000E+00
A1113	40.4000E-010.1000E+00	0.1250E+010.5000E+00-.2000E+00
A1114	40.4000E-010.1000E+00	0.1350E+010.5000E+00-.2000E+00
A1115	40.4000E-010.1000E+00	0.1450E+010.5000E+00-.2000E+00
A1116	40.8000E-010.2000E+00	0.1600E+010.5000E+00-.2000E+00
A1117	40.8000E-010.2000E+00	0.1800E+010.5000E+00-.2000E+00
A1118	40.8000E-010.2000E+00	0.2000E+010.5000E+00-.2000E+00
A1119	40.8000E-010.2000E+00	0.2200E+010.5000E+00-.2000E+00
A1120	40.8000E-010.2000E+00	0.2400E+010.5000E+00-.2000E+00
A1121	40.1600E+000.4000E+00	0.2700E+010.5000E+00-.2000E+00
A1122	40.1600E+000.4000E+00	0.3100E+010.5000E+00-.2000E+00
A1123	40.1600E+000.4000E+00	0.3500E+010.5000E+00-.2000E+00
A1124	40.1600E+000.4000E+00	0.3900E+010.5000E+00-.2000E+00
A1125	40.1600E+000.4000E+00	0.4300E+010.5000E+00-.2000E+00
...		

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## Part D (SimRad1\_Flow.txt)

```

*RADIONUCLIDE TRANSPORT PROBLEM*
ROCKS-----1-----2-----3-----4-----5-----6-----7-----8
CLAY      2      2650.      .12  1.00E-17  1.00E-17  1.00E-17  2.5      905.5
      1.83e-9  3.47e-5      .05  1.0      0.05      1.00e-00  1.00E-03
      7      0.4      0.5  1.0
      7      0.4      0.5  5.6e-7      1.0
CONTA     2      2650.      .17  1.00E-17  1.00E-17  1.00E-17  52.0      905.5
      1.83e-9  3.47e-5      .17  1.00E-17  1.00E-17  1.00E-00  1.00E-03
      7      0.4      0.3  1.0      0.05
      7      0.4      0.3  1.E-5      1.0
BENTO     2      2650.      .40  1.00E-20  1.00E-20  1.00E-20  1.35      964.0
      3.58e-9  1.5e-5      .40  1.00E-20  1.00E-20  1.00E-00  1.00E-03
      7      0.4      0.3  1.0      0.05
      7      0.4      0.3  5.6e-9      1.0
TOPBC     2      2650.      .12  1.00E-17  1.00E-17  1.00E-17  2.5      905.5
      1.83e-9  3.47e-5      .12  1.00E-17  1.00E-17  1.00E-00  1.00E-03
      7      0.4      0.5  1.0      0.05
      7      0.4      0.5  5.6e-7      1.0
BOTBC     2      2650.      .12  1.00E-17  1.00E-17  1.00E-17  2.5      905.5
      1.83e-9  3.47e-5      .12  1.00E-17  1.00E-17  1.00E-00  1.00E-03
      7      0.4      0.5  1.0      0.05
      7      0.4      0.5  5.6e-7      1.0

MULTI-----1-----2-----3-----4-----5-----6-----7-----8
      4      4      2      8
START-----1-----2-----3-----4-----5-----6-----7-----8
-----*-----1 MOP: 123456789*123456789*1234 -----*-----6-----7-----8
PARAM-----1-----2-----3-----4-----5-----6-----7-----8
      39999  99991      4      5
      6.3072e+10  1.0e+1      9.8
      1.E-05      1.E+0
      6.37E6      1.0e-3      0.0      0.0
      25.0

```

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```

SELEC---1---*---2---*---3---*---4---*---5---*---6---*---7---*---8
      6      1      24      2
      -1.e5

      0.e-0      0.e-1
      0.e-9      0.e-9      1.e-5      0.0e-9      0.e-9      1.e-11
      1.44e+10      241.0      0.e-6      1.162e-9      1.e+30
      6.0e+13      237.0      0.e-6      1.162e-9      1.e+30

```

```

GENER---1---*---2---*---3---*---4---*---5---*---6---*---7---*---8

INCON -- INITIAL CONDITIONS FOR 1251 ELEMENTS AT TIME 0.687195E+15
A21 1      0.11999874E+00
      0.6364272842591E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
A31 1      0.11999751E+00
      0.6358643959228E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
A41 1      0.11999632E+00
      0.6353230232886E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
A51 1      0.11999521E+00
      0.6348192292583E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
A61 1      0.11999448E+00
      0.6344880065463E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
A71 1      0.11999405E+00
      0.6342903223578E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
A81 1      0.11999368E+00
      0.6341224084628E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
A91 1      0.11999340E+00
      0.6339929140222E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
...

```

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```

AG1 1      0.39995933E+00
      0.6341600955190E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
AH1 1      0.39994129E+00
      0.6329000804083E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
AI1 1      0.39992342E+00
      0.6316519125714E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
AJ1 1      0.39990558E+00
      0.6304054632497E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
AK1 1      0.39988766E+00
      0.6291539927000E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
AL1 1      0.16997168E+00
      0.6278967637406E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
AM1 1      0.16997198E+00
      0.6279932630210E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
AN1 1      0.16997228E+00
      0.6280896469789E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
AO1 1      0.16997258E+00
      0.6281859446290E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
AP1 1      0.16997288E+00
      0.6282821872975E+07 0.1000000000000E-02 1.000000000000E-03 0.000000000000E+00
      0.2500000000000E+02
AQ1 1      0.16997318E+00
      0.6283784072965E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
AR1 1      0.16997348E+00
      0.6284746392687E+07 0.1000000000000E-02 0.000000000000E+00 0.000000000000E+00
      0.2500000000000E+02
...

```

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## Part E (SimRad2\_1.txt)

```

*RADIONUCLIDE TRANSPORT PROBLEM*
ROCKS-----1-----2-----3-----4-----5-----6-----7-----8
CLAY      2      2650.      .12 1.00E-17 1.00E-17 1.00E-17 2.5      905.5
          1.83e-9 3.47e-5      1.      5.00e-04 5.00E-04
          7      0.4      0.5      1.0      0.05
          7      0.4      0.5      5.6e-7      1.0
CONTA     2      2650.      .17 1.00E-17 1.00E-17 1.00E-17 52.0      905.5
          1.83e-9 3.47e-5      1.      5.00e-04 5.00E-04
          7      0.4      0.3      1.      0.05
          7      0.4      0.3      1.E-5      1.0
BENTO     2      2650.      .40 1.00E-20 1.00E-20 1.00E-20 1.35      964.0
          3.58e-9 1.5e-5      1.      5.00e-04 5.00E-04
          7      0.4      0.3      1.      0.05
          7      0.4      0.3      5.6e-9      1.0
TOPBC     2      2650.      .12 1.00E-17 1.00E-17 1.00E-17 2.5      905.5
          1.83e-9 3.47e-5      1.      5.00e-04 5.00E-04
          7      0.4      0.5      1.      0.05
          7      0.4      0.5      5.6e-7      1.0
BOTBC     2      2650.      .12 1.00E-17 1.00E-17 1.00E-17 2.5      905.5
          1.83e-9 3.47e-5      1.      5.00e-04 5.00E-04
          7      0.4      0.5      1.      0.05
          7      0.4      0.5      5.6e-7      1.0

MULTI-----1-----2-----3-----4-----5-----6-----7-----8
          5      6      2      8
START-----1-----2-----3-----4-----5-----6-----7-----8
-----1 MOP: 123456789*123456789*1234 -----5-----6-----7-----8
PARAM-----1-----2-----3-----4-----5-----6-----7-----8
          39999      99991      4      5
          5.0e+8      1.0e+3      9.8
          1.E-04      1.E+0
          6.37E6      1.0e-3      0.0      0.0
          0.0      25.0

```

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SELEC-----1-----2-----3-----4-----5-----6-----7-----8
          6      1      24      2
          -1.e5

          0.e-0      0.e-1
          0.e-9      0.e-9      1.e-5      0.0e-9      0.e-9      1.e-11
          1.8e11      14.0      1.e-5      1.0e-9      1.e-8
          1.0e30      14.0      1.e-5      1.0e-9      2.e-10

FOFT -----1-----2-----3-----4-----5-----6-----7-----8
AE1 1
AO1 1

GENER-----1-----2-----3-----4-----5-----6-----7-----8
AL1 1AIR 1      4      1      COM5      3.0e-10
AM1 1AIR 1      4      1      COM5      3.0e-10
AN1 1AIR 1      4      1      COM5      3.0e-10
AO1 1AIR 1      4      1      COM5      3.0e-10
AP1 1AIR 1      4      1      COM5      3.0e-10
AQ1 1AIR 1      4      1      COM5      3.0e-10
AR1 1AIR 1      4      1      COM5      3.0e-10
AS1 1AIR 1      4      1      COM5      3.0e-10
AT1 1AIR 1      4      1      COM5      3.0e-10
AU1 1AIR 1      4      1      COM5      3.0e-10
AL1 1C14 1      4      1      COM3      1.0e-13
AM1 1C14 1      4      1      COM3      1.0e-13
AN1 1C14 1      4      1      COM3      1.0e-13
AO1 1C14 1      4      1      COM3      1.0e-13
AP1 1C14 1      4      1      COM3      1.0e-13
AQ1 1C14 1      4      1      COM3      1.0e-13
AR1 1C14 1      4      1      COM3      1.0e-13
AS1 1C14 1      4      1      COM3      1.0e-13
AT1 1C14 1      4      1      COM3      1.0e-13
AU1 1C14 1      4      1      COM3      1.0e-13
AL1 1HEA 1      4      1      HEAT      1.00
AM1 1HEA 1      4      1      HEAT      1.00
AN1 1HEA 1      4      1      HEAT      1.00
...

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AO1 1HEA 1 4 1 HEAT 1.00
AP1 1HEA 1 4 1 HEAT 1.00
AQ1 1HEA 1 4 1 HEAT 1.00
AR1 1HEA 1 4 1 HEAT 1.00
AS1 1HEA 1 4 1 HEAT 1.00
AT1 1HEA 1 4 1 HEAT 1.00
AU1 1HEA 1 4 1 HEAT 1.00

INCON -- INITIAL CONDITIONS FOR 1251 ELEMENTS AT TIME 0.274878E+15
A21 1 0.12000086E+00
0.6373919816909E+07 0.9999999999992E-03 0.0000000000000E+00 0.0000000000000E+00
0.0000000000000E+00 0.2500000000000E+02
A31 1 0.12000172E+00
0.6377839640616E+07 0.1000000000002E-02 0.0000000000000E+00 0.0000000000000E+00
0.0000000000000E+00 0.2500000000000E+02
A41 1 0.12000258E+00
0.6381759471120E+07 0.9999999999907E-03 0.0000000000000E+00 0.0000000000000E+00
0.0000000000000E+00 0.2500000000000E+02
A51 1 0.12000344E+00
0.6385679308422E+07 0.9999999999967E-03 0.0000000000000E+00 0.0000000000000E+00
0.0000000000000E+00 0.2500000000000E+02
A61 1 0.12000409E+00
...

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## Part E (SimRad2\_2.txt)

```

*RADIONUCLIDE TRANSPORT PROBLEM*
ROCKS-----1-----2-----3-----4-----5-----6-----7-----8
CLAY 2 2650. .12 1.00E-17 1.00E-17 1.00E-17 2.5 905.5
1.83e-9 3.47e-5 1. 5.00e-04 5.00E-04
7 0.4 0.5 1.0 0.05
7 0.4 0.5 5.6e-7 1.0
CONTA 2 2650. .17 1.00E-17 1.00E-17 1.00E-17 52.0 905.5
1.83e-9 3.47e-5 1. 5.00e-04 5.00E-04
7 0.4 0.3 1. 0.05
7 0.4 0.3 1.E-5 1.0
BENTO 2 2650. .40 1.00E-20 1.00E-20 1.00E-20 1.35 964.0
3.58e-9 1.5e-5 1. 5.00e-04 5.00E-04
7 0.4 0.3 1. 0.05
7 0.4 0.3 5.6e-9 1.0
TOPBC 2 2650. .12 1.00E-17 1.00E-17 1.00E-17 2.5 905.5
1.83e-9 3.47e-5 1. 5.00e-04 5.00E-04
7 0.4 0.5 1. 0.05
7 0.4 0.5 5.6e-7 1.0
BOTBC 2 2650. .12 1.00E-17 1.00E-17 1.00E-17 2.5 905.5
1.83e-9 3.47e-5 1. 5.00e-04 5.00E-04
7 0.4 0.5 1. 0.05
7 0.4 0.5 5.6e-7 1.0

MULTI-----1-----2-----3-----4-----5-----6-----7-----8
5 6 2 8
START-----1-----2-----3-----4-----5-----6-----7-----8
-----1 MOP: 123456789*123456789*1234 -----5-----6-----7-----8
PARAM-----1-----2-----3-----4-----5-----6-----7-----8
39999 99991 4 5
5.01728e+8 1.0e+3 9.8
1.E-04 1.E+0
6.37E6 1.0e-3 0.0 0.0
0.0 25.0

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SELEC---1---*---2---*---3---*---4---*---5---*---6---*---7---*---8
      6      1      24      2
      -1.e5

      0.e-0      0.e-1
      0.e-9      0.e-9      1.e-5      0.0e-9      0.e-9      1.e-11
      1.8e11      14.0      1.e-5      1.0e-9      1.e-8
      1.0e30      14.0      1.e-5      1.0e-9      2.e-10

FOPT ---1---*---2---*---3---*---4---*---5---*---6---*---7---*---8
AE1 1
AO1 1

GENER---1---*---2---*---3---*---4---*---5---*---6---*---7---*---8
AL1 1AIR 1 4 1 COM5 3.0e-10
AM1 1AIR 1 4 1 COM5 3.0e-10
AN1 1AIR 1 4 1 COM5 3.0e-10
AO1 1AIR 1 4 1 COM5 3.0e-10
AP1 1AIR 1 4 1 COM5 3.0e-10
AQ1 1AIR 1 4 1 COM5 3.0e-10
AR1 1AIR 1 4 1 COM5 3.0e-10
AS1 1AIR 1 4 1 COM5 3.0e-10
AT1 1AIR 1 4 1 COM5 3.0e-10
AU1 1AIR 1 4 1 COM5 3.0e-10
AL1 1C14 1 4 1 COM3 1.0e-13
AM1 1C14 1 4 1 COM3 1.0e-13
AN1 1C14 1 4 1 COM3 1.0e-13
AO1 1C14 1 4 1 COM3 1.0e-13
AP1 1C14 1 4 1 COM3 1.0e-13
AQ1 1C14 1 4 1 COM3 1.0e-13
AR1 1C14 1 4 1 COM3 1.0e-13
AS1 1C14 1 4 1 COM3 1.0e-13
AT1 1C14 1 4 1 COM3 1.0e-13
AU1 1C14 1 4 1 COM3 1.0e-13
AL1 1HEA 1 4 1 HEAT 1.00
AM1 1HEA 1 4 1 HEAT 1.00
...

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AN1 1HEA 1 4 1 HEAT 1.00
AO1 1HEA 1 4 1 HEAT 1.00
AP1 1HEA 1 4 1 HEAT 1.00
AQ1 1HEA 1 4 1 HEAT 1.00
AR1 1HEA 1 4 1 HEAT 1.00
AS1 1HEA 1 4 1 HEAT 1.00
AT1 1HEA 1 4 1 HEAT 1.00
AU1 1HEA 1 4 1 HEAT 1.00

INCON -- INITIAL CONDITIONS FOR 1251 ELEMENTS AT TIME 0.500000E+09
A21 1 0.12000536E+00
0.6374000915391E+07 0.1000000000026E-02 0.5569126554103E-16 0.2331270365019E-18
0.8664283833566E-20 0.2607711373189E+02
A31 1 0.12001080E+00
0.6377999932395E+07 0.9999999999120E-03 0.1079403670680E-14 0.4211340455500E-17
0.3980273919673E-18 0.2717146520376E+02
A41 1 0.12001639E+00
0.6381998251120E+07 0.9999999999851E-03 0.2046657817590E-13 0.7400076246940E-16
0.1805346242483E-16 0.2830264322032E+02
A51 1 0.12002223E+00
0.6385997247117E+07 0.1000000000444E-02 0.3788238250435E-12 0.1261076149346E-14
0.8100797665784E-15 0.2949561382279E+02
A61 1 0.12002692E+00
0.6388998954031E+07 0.99999999998392E-03 0.5207644024536E-11 0.1585693756698E-13
0.3098439262167E-13 0.3046303591434E+02
A71 1 0.12003019E+00
0.6391001188322E+07 0.9999999999443E-03 0.2850148282396E-10 0.8008835524733E-13
0.4820218385785E-12 0.3114236594327E+02
A81 1 0.12003364E+00
0.6393005107089E+07 0.1000000000125E-02 0.1568258500002E-09 0.4040533742984E-12
0.7186702924224E-11 0.3186489833060E+02
A91 1 0.12003732E+00
0.6395011415772E+07 0.99999999989503E-03 0.8321343184000E-09 0.1946971946332E-11
0.1012416674525E-09 0.3264240265539E+02
AA1 1 0.12004130E+00
...

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*      # 4 - RM2      *
*
*      # 5 - AIR      *
*
*      # 6 - HEAT     *
*
*****
(*) SINGLE-PHASE GAS NOT FULLY IMPLEMENTED.
(*) XRN1 AND XRN2 ARE ALWAYS MASS FRACTIONS IN THE AQUEOUS PHASE.
*****

NEGATIVE REFERENCE PRESSURE OF -.100000E+06 PA WAS SPECIFIED, THUS BRINE PROPERTIES ARE IDENTICAL TO WATER FOR ALL SALINITIES.

PROPERTIES OF THE RADIONUCLIDES:  DOMAIN  RADIONUCLIDE(1)  RADIONUCLIDE(2)
HALF-LIFE (SECONDS):  -ALL-  0.1800E+12  0.1000E+31
MOLECULAR WEIGHT (GM/MOLE):  -ALL-  0.1400E+02  0.1400E+02
INVERSE HENRY CONST. (MOLE/PA):  -ALL-  0.1000E-07  0.2000E-09
GAS PHASE DIFFUSIVITY (M**2/S):  -ALL-  0.1000E-04  0.1000E-04
AQ. PHASE DIFFUSIVITY (M**2/S):  -ALL-  0.1000E-08  0.1000E-08
DISTRIBUTION COEFF. (M**3/KG):  CLAY  0.5000E-03  0.5000E-03
DISTRIBUTION COEFF. (M**3/KG):  CONTA  0.5000E-03  0.5000E-03
DISTRIBUTION COEFF. (M**3/KG):  BENTO  0.5000E-03  0.5000E-03
DISTRIBUTION COEFF. (M**3/KG):  TOPBC  0.5000E-03  0.5000E-03
DISTRIBUTION COEFF. (M**3/KG):  BOTBC  0.5000E-03  0.5000E-03

MOLECULAR DIFFUSIVITY OF WATER, BRINE, XRN1, XRN2, AND AIR THROUGH THE GASEOUS AND AQUEOUS PHASES, (PDDIAG(PHASE,COMP)) [M**2/S]:
PHASE 1 = GAS; PHASE 2 = AQUEOUS
PHASE COMP PHASE COMP PHASE COMP PHASE COMP PHASE COMP PHASE COMP PHASE COMP PHASE COMP PHASE COMP
-1- -1- -2- -1- -3- -1- -4- -2- -3- -2- -4- -5-
0.0000E+00 0.0000E+00 0.1000E-04 0.1000E-04 0.1000E-04 0.0000E+00 0.0000E+00 0.1000E-08 0.1000E-08 0.1000E-10

***** VOLUME- AND MASS-BALANCES *****
***** [KCYC,ITER] = [ 46, 0] ***** THE TIME IS 0.500000E+09 SECONDS, OR 0.578704E+04 DAYS

PHASES PRESENT
PHASES * GAS AQUEOUS
*****
VOLUME (M**3) * 0.45163332E-01 0.48327851E+01
MASS (KG) * 0.71172939E+01 0.48246059E+04
*****

COMPONENT MASS IN PLACE (KG)
PHASES * GAS AQUEOUS
*****
COMPONENTS *
WATER * 0.27938157E-02 0.48193957E+04 0.00000000E+00 0.48193985E+04
BRINE * 0.00000000E+00 0.48242227E+01 0.00000000E+00 0.48242227E+01
RNI * 0.53218983E-04 0.50146789E-03 0.19425825E-02 0.24973398E-02
RN2 * 0.9966019E-06 0.36766413E-06 0.12409007E-05 0.26052250E-05
AIR * 0.71144458E+01 0.38552179E+00 0.00000000E+00 0.74999676E+01
*****

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*RADIONUCLIDE TRANSPORT PROBLEM*

OUTPUT DATA AFTER ( 100, 7)-2-TIME STEPS THE TIME IS 0.580704E+04 DAYS

*****
TOTAL TIME KCYC ITER ITERC KON DX1M DX2M DX3M MAX. RES. NER KER DELTEX
0.501728E+09 100 7 604 2 0.40694E+06 0.76143E-06 0.37950E-08 0.57103E-05 397 1 0.53000E+05
*****

ELEM. INDEX P T SL XBRINE(LIQ) XRN1(LIQ) XRN2(LIQ) XAIRG XRN1(GAS) XRN2(GAS) DL
(PA) (DEG-C) (KG/M**3)
A21 1 1 0.64226E+07 0.26088E+02 0.10000E+01 0.10000E-02 0.61086E-16 0.25439E-18 0.75804E-10 0.18061E-11 0.37608E-12 0.99968E+03
A31 1 2 0.64758E+07 0.27195E+02 0.10000E+01 0.10000E-02 0.11898E-14 0.46145E-17 0.18481E-07 0.32959E-10 0.63912E-11 0.99940E+03
A41 1 3 0.65316E+07 0.28341E+02 0.10000E+01 0.10000E-02 0.22751E-13 0.81678E-16 0.39293E-05 0.58939E-09 0.10580E-09 0.99909E+03
A51 1 4 0.65925E+07 0.29548E+02 0.10000E+01 0.10000E-02 0.41683E-12 0.11781E-14 0.68525E-03 0.10059E-07 0.16628E-08 0.99875E+03
A61 1 5 0.66455E+07 0.30543E+02 0.10000E+01 0.10000E-02 0.56448E-11 0.17090E-13 0.86599E-01 0.11763E-06 0.17807E-07 0.99847E+03
A71 1 6 0.66840E+07 0.31240E+02 0.10000E+01 0.10000E-02 0.31225E-10 0.87231E-13 0.85664E+00 0.98148E-07 0.13709E-07 0.99826E+03
A81 1 7 0.67258E+07 0.31985E+02 0.10000E+01 0.99981E-03 0.17293E-09 0.53909E-12 0.99755E+00 0.89228E-08 0.13908E-08 0.99804E+03
A91 1 8 0.81313E+07 0.32790E+02 0.91139E+00 0.99869E-03 0.93268E-09 0.14154E-10 0.99962E+00 0.71408E-08 0.54184E-08 0.99839E+03
A11 1 9 0.87219E+07 0.33678E+02 0.89875E+00 0.99860E-03 0.47125E-08 0.79132E-10 0.99963E+00 0.33638E-07 0.28242E-07 0.99834E+03
A11 10 0.90502E+07 0.34428E+02 0.88308E+00 0.99855E-03 0.18154E-07 0.24129E-09 0.99962E+00 0.12489E-06 0.82995E-07 0.99823E+03
A11 11 0.92511E+07 0.34967E+02 0.87496E+00 0.99851E-03 0.40595E-07 0.35913E-09 0.99962E+00 0.27320E-06 0.12085E-06 0.99813E+03
A11 12 0.94580E+07 0.35556E+02 0.86799E+00 0.99848E-03 0.91707E-07 0.43273E-09 0.99962E+00 0.60369E-06 0.14243E-06 0.99801E+03
A11 13 0.96976E+07 0.36213E+02 0.86172E+00 0.99844E-03 0.20274E-06 0.46187E-09 0.99961E+00 0.13016E-05 0.14826E-06 0.99788E+03
A11 14 0.10022E+08 0.36977E+02 0.85616E+00 0.99839E-03 0.39016E-06 0.47844E-09 0.99961E+00 0.24240E-05 0.14862E-06 0.99774E+03
A11 15 0.10567E+08 0.37943E+02 0.85186E+00 0.99830E-03 0.55739E-06 0.50368E-09 0.99961E+00 0.32843E-05 0.14839E-06 0.99761E+03
A11 16 0.11036E+08 0.39061E+02 0.84785E+00 0.99823E-03 0.71885E-06 0.52509E-09 0.99960E+00 0.40558E-05 0.14813E-06 0.99739E+03
A11 17 0.11435E+08 0.40278E+02 0.84300E+00 0.99816E-03 0.94149E-06 0.54307E-09 0.99959E+00 0.51267E-05 0.14786E-06 0.99709E+03
A11 18 0.11767E+08 0.41569E+02 0.83686E+00 0.99811E-03 0.12252E-05 0.55782E-09 0.99957E+00 0.64837E-05 0.14759E-06 0.99672E+03
A11 19 0.12035E+08 0.42914E+02 0.82883E+00 0.99807E-03 0.15360E-05 0.56948E-09 0.99955E+00 0.79474E-05 0.14733E-06 0.99629E+03
A11 20 0.12051E+08 0.43628E+02 0.44066E+00 0.99812E-03 0.17000E-05 0.56966E-09 0.99953E+00 0.87847E-05 0.14719E-06 0.99601E+03
A11 21 0.12060E+08 0.43674E+02 0.49511E+00 0.99812E-03 0.17351E-05 0.57021E-09 0.99953E+00 0.89597E-05 0.14722E-06 0.99599E+03
A11 22 0.12066E+08 0.43708E+02 0.52981E+00 0.99812E-03 0.17670E-05 0.57076E-09 0.99953E+00 0.91200E-05 0.14729E-06 0.99598E+03
A11 23 0.12070E+08 0.43730E+02 0.54840E+00 0.99812E-03 0.17914E-05 0.57123E-09 0.99953E+00 0.92421E-05 0.14735E-06 0.99597E+03
A11 24 0.12074E+08 0.43741E+02 0.55672E+00 0.99812E-03 0.18044E-05 0.57133E-09 0.99953E+00 0.93062E-05 0.14739E-06 0.99597E+03
A11 25 0.12077E+08 0.43745E+02 0.55686E+00 0.99812E-03 0.18040E-05 0.57162E-09 0.99953E+00 0.93023E-05 0.14737E-06 0.99597E+03
A11 26 0.12079E+08 0.43737E+02 0.54879E+00 0.99812E-03 0.17904E-05 0.57151E-09 0.99953E+00 0.92302E-05 0.14732E-06 0.99597E+03
A11 27 0.12081E+08 0.43719E+02 0.53036E+00 0.99812E-03 0.17653E-05 0.57127E-09 0.99953E+00 0.90998E-05 0.14724E-06 0.99598E+03
A11 28 0.12081E+08 0.43692E+02 0.49544E+00 0.99812E-03 0.17331E-05 0.57105E-09 0.99953E+00 0.89335E-05 0.14717E-06 0.99599E+03
A11 29 0.12082E+08 0.43659E+02 0.43337E+00 0.99812E-03 0.17014E-05 0.57099E-09 0.99953E+00 0.87697E-05 0.14715E-06 0.99601E+03
A11 30 0.14332E+08 0.42876E+02 0.99854E+00 0.99771E-03 0.14460E-05 0.70703E-09 0.99962E+00 0.62835E-05 0.15362E-06 0.99729E+03
A11 31 0.66176E+07 0.41385E+02 0.10000E+01 0.99917E-03 0.10720E-05 0.70225E-09 0.99903E+00 0.12855E-04 0.42107E-06 0.99459E+03
A11 32 0.65636E+07 0.39954E+02 0.10000E+01 0.99974E-03 0.81278E-06 0.64553E-09 0.99718E+00 0.30679E-04 0.12183E-05 0.99513E+03
A11 33 0.65223E+07 0.38594E+02 0.10000E+01 0.99993E-03 0.61958E-06 0.57052E-09 0.99003E+00 0.89291E-04 0.41111E-05 0.99563E+03

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