

Summary : Hematite - GW DSR Ra-226+C

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Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

| | |
|--|----|
| Dose Conversion Factor (and Related) Parameter Summary ... | 2 |
| Site-Specific Parameter Summary | 3 |
| Summary of Pathway Selections | 7 |
| Contaminated Zone and Total Dose Summary | 8 |
| Total Dose Components | |
| Time = 0.000E+00 | 9 |
| Time = 1.000E+00 | 10 |
| Dose/Source Ratios Summed Over All Pathways | 11 |
| Single Radionuclide Soil Guidelines | 11 |
| Dose Per Nuclide Summed Over All Pathways | 12 |
| Soil Concentration Per Nuclide | 12 |

Summary : Hematite - GW DSR Ra-226+C

File : C:\RESRAD_FAMILY\RESRAD\USERFILES\HEMATITE - GW DSR RA-226+C.RAD

Dose Conversion Factor (and Related) Parameter Summary

Dose Library: Hematite Plus FGR 11

| Menu | Parameter | Current Value# | Base Case* | Parameter Name |
|------|--|----------------|------------|----------------|
| A-1 | DCF's for external ground radiation, (mrem/yr)/(pCi/g) | | | |
| A-1 | At-218 (Source: FGR 12) | 5.847E-03 | 5.847E-03 | DCF1(1) |
| A-1 | Bi-210 (Source: FGR 12) | 3.606E-03 | 3.606E-03 | DCF1(2) |
| A-1 | Bi-214 (Source: FGR 12) | 9.808E+00 | 9.808E+00 | DCF1(3) |
| A-1 | Pb-210 (Source: FGR 12) | 2.447E-03 | 2.447E-03 | DCF1(4) |
| A-1 | Pb-214 (Source: FGR 12) | 1.341E+00 | 1.341E+00 | DCF1(5) |
| A-1 | Po-210 (Source: FGR 12) | 5.231E-05 | 5.231E-05 | DCF1(6) |
| A-1 | Po-214 (Source: FGR 12) | 5.138E-04 | 5.138E-04 | DCF1(7) |
| A-1 | Po-218 (Source: FGR 12) | 5.642E-05 | 5.642E-05 | DCF1(8) |
| A-1 | Ra-226 (Source: FGR 12) | 3.176E-02 | 3.176E-02 | DCF1(9) |
| A-1 | Rn-222 (Source: FGR 12) | 2.354E-03 | 2.354E-03 | DCF1(10) |
| A-1 | Tl-210 (Source: no data) | 0.000E+00 | -2.000E+00 | DCF1(11) |
| B-1 | Dose conversion factors for inhalation, mrem/pCi: | | | |
| B-1 | Pb-210+D | 2.320E-02 | 1.360E-02 | DCF2(1) |
| B-1 | Ra-226+D | 8.594E-03 | 8.580E-03 | DCF2(2) |
| D-1 | Dose conversion factors for ingestion, mrem/pCi: | | | |
| D-1 | Pb-210+D | 7.276E-03 | 5.370E-03 | DCF3(1) |
| D-1 | Ra-226+D | 1.321E-03 | 1.320E-03 | DCF3(2) |
| D-34 | Food transfer factors: | | | |
| D-34 | Pb-210+D , plant/soil concentration ratio, dimensionless | 7.400E-03 | 1.000E-02 | RTF(1,1) |
| D-34 | Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d) | 8.000E-04 | 8.000E-04 | RTF(1,2) |
| D-34 | Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d) | 5.570E-04 | 3.000E-04 | RTF(1,3) |
| D-34 | | | | |
| D-34 | Ra-226+D , plant/soil concentration ratio, dimensionless | 7.400E-02 | 4.000E-02 | RTF(2,1) |
| D-34 | Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d) | 1.000E-03 | 1.000E-03 | RTF(2,2) |
| D-34 | Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d) | 1.000E-04 | 1.000E-03 | RTF(2,3) |
| D-5 | Bioaccumulation factors, fresh water, L/kg: | | | |
| D-5 | Pb-210+D , fish | 2.930E+02 | 3.000E+02 | BIOFAC(1,1) |
| D-5 | Pb-210+D , crustacea and mollusks | 1.000E+02 | 1.000E+02 | BIOFAC(1,2) |
| D-5 | | | | |
| D-5 | Ra-226+D , fish | 4.930E+01 | 5.000E+01 | BIOFAC(2,1) |
| D-5 | Ra-226+D , crustacea and mollusks | 2.500E+02 | 2.500E+02 | BIOFAC(2,2) |

#For DCF1(xxx) only, factors are for infinite depth & area. See EFTG table in Ground Pathway of Detailed Report.

*Base Case means Default.Lib w/o Associate Nuclide contributions.

Summary : Hematite - GW DSR Ra-226+C

File : C:\RESRAD_FAMILY\RESRAD\USERFILES\HEMATITE - GW DSR RA-226+C.RAD

Site-Specific Parameter Summary

| Menu | Parameter | User Input | Default | Used by RESRAD (If different from user input) | Parameter Name |
|------|---|------------|-----------|--|----------------|
| R011 | Area of contaminated zone (m**2) | 1.292E+03 | 1.000E+04 | --- | AREA |
| R011 | Thickness of contaminated zone (m) | 5.200E+00 | 2.000E+00 | --- | THICKO |
| R011 | Length parallel to aquifer flow (m) | 4.100E+01 | 1.000E+02 | --- | LCZPAQ |
| R011 | Basic radiation dose limit (mrem/yr) | 2.500E+01 | 3.000E+01 | --- | BRDL |
| R011 | Time since placement of material (yr) | 1.000E+00 | 0.000E+00 | --- | TI |
| R011 | Times for calculations (yr) | 1.000E+00 | 1.000E+00 | --- | T(2) |
| R011 | Times for calculations (yr) | not used | 3.000E+00 | --- | T(3) |
| R011 | Times for calculations (yr) | not used | 1.000E+01 | --- | T(4) |
| R011 | Times for calculations (yr) | not used | 3.000E+01 | --- | T(5) |
| R011 | Times for calculations (yr) | not used | 1.000E+02 | --- | T(6) |
| R011 | Times for calculations (yr) | not used | 3.000E+02 | --- | T(7) |
| R011 | Times for calculations (yr) | not used | 1.000E+03 | --- | T(8) |
| R011 | Times for calculations (yr) | not used | 0.000E+00 | --- | T(9) |
| R011 | Times for calculations (yr) | not used | 0.000E+00 | --- | T(10) |
| R012 | Initial principal radionuclide (pCi/g): Pb-210 | 1.000E+00 | 0.000E+00 | --- | S1(1) |
| R012 | Initial principal radionuclide (pCi/g): Ra-226 | 1.000E+00 | 0.000E+00 | --- | S1(2) |
| R012 | Concentration in groundwater (pCi/L): Pb-210 | not used | 0.000E+00 | --- | W1(1) |
| R012 | Concentration in groundwater (pCi/L): Ra-226 | not used | 0.000E+00 | --- | W1(2) |
| R013 | Cover depth (m) | 1.500E+00 | 0.000E+00 | --- | COVERO |
| R013 | Density of cover material (g/cm**3) | not used | 1.500E+00 | --- | DENSCV |
| R013 | Cover depth erosion rate (m/yr) | 6.000E-04 | 1.000E-03 | --- | VCV |
| R013 | Density of contaminated zone (g/cm**3) | 1.690E+00 | 1.500E+00 | --- | DENSCZ |
| R013 | Contaminated zone erosion rate (m/yr) | 6.000E-04 | 1.000E-03 | --- | VCZ |
| R013 | Contaminated zone total porosity | 4.500E-01 | 4.000E-01 | --- | TPCZ |
| R013 | Contaminated zone field capacity | 1.700E-01 | 2.000E-01 | --- | FCCZ |
| R013 | Contaminated zone hydraulic conductivity (m/yr) | 1.456E+01 | 1.000E+01 | --- | HCCZ |
| R013 | Contaminated zone b parameter | 9.900E+00 | 5.300E+00 | --- | BCZ |
| R013 | Average annual wind speed (m/sec) | 4.300E+00 | 2.000E+00 | --- | WIND |
| R013 | Humidity in air (g/m**3) | not used | 8.000E+00 | --- | HUMID |
| R013 | Evapotranspiration coefficient | 8.000E-01 | 5.000E-01 | --- | EVAPTR |
| R013 | Precipitation (m/yr) | 1.010E+00 | 1.000E+00 | --- | PRECIP |
| R013 | Irrigation (m/yr) | 1.400E-01 | 2.000E-01 | --- | RI |
| R013 | Irrigation mode | overhead | overhead | --- | IDITCH |
| R013 | Runoff coefficient | 4.000E-01 | 2.000E-01 | --- | RUNOFF |
| R013 | Watershed area for nearby stream or pond (m**2) | 9.989E+05 | 1.000E+06 | --- | WAREA |
| R013 | Accuracy for water/soil computations | 1.000E-03 | 1.000E-03 | --- | EPS |
| R014 | Density of saturated zone (g/cm**3) | 1.510E+00 | 1.500E+00 | --- | DENSAQ |
| R014 | Saturated zone total porosity | 4.300E-01 | 4.000E-01 | --- | TPSZ |
| R014 | Saturated zone effective porosity | 3.800E-01 | 2.000E-01 | --- | EPSZ |
| R014 | Saturated zone field capacity | 1.500E-01 | 2.000E-01 | --- | FCSZ |
| R014 | Saturated zone hydraulic conductivity (m/yr) | 2.520E+03 | 1.000E+02 | --- | HCSZ |
| R014 | Saturated zone hydraulic gradient | 1.100E-02 | 2.000E-02 | --- | HGWT |
| R014 | Saturated zone b parameter | not used | 5.300E+00 | --- | BSZ |
| R014 | Water table drop rate (m/yr) | 0.000E+00 | 1.000E-03 | --- | VWT |
| R014 | Well pump intake depth (m below water table) | 2.500E+00 | 1.000E+01 | --- | DWIBWT |
| R014 | Model: Nondispersion (ND) or Mass-Balance (MB) | MB | ND | --- | MODEL |
| R014 | Well pumping rate (m**3/yr) | 3.338E+03 | 2.500E+02 | --- | UW |

Summary : Hematite - GW DSR Ra-226+C

File : C:\RESRAD_FAMILY\RESRAD\USERFILES\HEMATITE - GW DSR RA-226+C.RAD

Site-Specific Parameter Summary (continued)

| Menu | Parameter | User Input | Default | Used by RESRAD (If different from user input) | Parameter Name |
|------|--|------------|-----------|--|----------------|
| R015 | Number of unsaturated zone strata | 0 | 1 | --- | NS |
| R016 | Distribution coefficients for Pb-210 | | | | |
| R016 | Contaminated zone (cm**3/g) | 5.500E+02 | 1.000E+02 | --- | DCNUCC (1) |
| R016 | Saturated zone (cm**3/g) | 0.000E+00 | 1.000E+02 | --- | DCNUCS (1) |
| R016 | Leach rate (/yr) | 0.000E+00 | 0.000E+00 | 3.086E-05 | ALEACH (1) |
| R016 | Solubility constant | 0.000E+00 | 0.000E+00 | not used | SOLUBK (1) |
| R016 | Distribution coefficients for Ra-226 | | | | |
| R016 | Contaminated zone (cm**3/g) | 9.100E+03 | 7.000E+01 | --- | DCNUCC (2) |
| R016 | Saturated zone (cm**3/g) | 0.000E+00 | 7.000E+01 | --- | DCNUCS (2) |
| R016 | Leach rate (/yr) | 0.000E+00 | 0.000E+00 | 1.866E-06 | ALEACH (2) |
| R016 | Solubility constant | 0.000E+00 | 0.000E+00 | not used | SOLUBK (2) |
| R017 | Inhalation rate (m**3/yr) | not used | 8.400E+03 | --- | INHALR |
| R017 | Mass loading for inhalation (g/m**3) | not used | 1.000E-04 | --- | MLINH |
| R017 | Exposure duration | 3.000E+01 | 3.000E+01 | --- | ED |
| R017 | Shielding factor, inhalation | not used | 4.000E-01 | --- | SHF3 |
| R017 | Shielding factor, external gamma | not used | 7.000E-01 | --- | SHF1 |
| R017 | Fraction of time spent indoors | not used | 5.000E-01 | --- | FIND |
| R017 | Fraction of time spent outdoors (on site) | not used | 2.500E-01 | --- | FOTD |
| R017 | Shape factor flag, external gamma | not used | 1.000E+00 | >0 shows circular AREA. | FS |
| R017 | Radii of shape factor array (used if FS = -1): | | | | |
| R017 | Outer annular radius (m), ring 1: | not used | 5.000E+01 | --- | RAD_SHAPE (1) |
| R017 | Outer annular radius (m), ring 2: | not used | 7.071E+01 | --- | RAD_SHAPE (2) |
| R017 | Outer annular radius (m), ring 3: | not used | 0.000E+00 | --- | RAD_SHAPE (3) |
| R017 | Outer annular radius (m), ring 4: | not used | 0.000E+00 | --- | RAD_SHAPE (4) |
| R017 | Outer annular radius (m), ring 5: | not used | 0.000E+00 | --- | RAD_SHAPE (5) |
| R017 | Outer annular radius (m), ring 6: | not used | 0.000E+00 | --- | RAD_SHAPE (6) |
| R017 | Outer annular radius (m), ring 7: | not used | 0.000E+00 | --- | RAD_SHAPE (7) |
| R017 | Outer annular radius (m), ring 8: | not used | 0.000E+00 | --- | RAD_SHAPE (8) |
| R017 | Outer annular radius (m), ring 9: | not used | 0.000E+00 | --- | RAD_SHAPE (9) |
| R017 | Outer annular radius (m), ring 10: | not used | 0.000E+00 | --- | RAD_SHAPE (10) |
| R017 | Outer annular radius (m), ring 11: | not used | 0.000E+00 | --- | RAD_SHAPE (11) |
| R017 | Outer annular radius (m), ring 12: | not used | 0.000E+00 | --- | RAD_SHAPE (12) |
| R017 | Fractions of annular areas within AREA: | | | | |
| R017 | Ring 1 | not used | 1.000E+00 | --- | FRACA (1) |
| R017 | Ring 2 | not used | 2.732E-01 | --- | FRACA (2) |
| R017 | Ring 3 | not used | 0.000E+00 | --- | FRACA (3) |
| R017 | Ring 4 | not used | 0.000E+00 | --- | FRACA (4) |
| R017 | Ring 5 | not used | 0.000E+00 | --- | FRACA (5) |
| R017 | Ring 6 | not used | 0.000E+00 | --- | FRACA (6) |
| R017 | Ring 7 | not used | 0.000E+00 | --- | FRACA (7) |
| R017 | Ring 8 | not used | 0.000E+00 | --- | FRACA (8) |
| R017 | Ring 9 | not used | 0.000E+00 | --- | FRACA (9) |
| R017 | Ring 10 | not used | 0.000E+00 | --- | FRACA (10) |
| R017 | Ring 11 | not used | 0.000E+00 | --- | FRACA (11) |
| R017 | Ring 12 | not used | 0.000E+00 | --- | FRACA (12) |

Summary : Hematite - GW DSR Ra-226+C

File : C:\RESRAD_FAMILY\RESRAD\USERFILES\HEMATITE - GW DSR RA-226+C.RAD

Site-Specific Parameter Summary (continued)

| Menu | Parameter | User Input | Default | Used by RESRAD (If different from user input) | Parameter Name |
|------|--|------------|-----------|--|----------------|
| R018 | Fruits, vegetables and grain consumption (kg/yr) | 1.120E+02 | 1.600E+02 | --- | DIET(1) |
| R018 | Leafy vegetable consumption (kg/yr) | 2.100E+01 | 1.400E+01 | --- | DIET(2) |
| R018 | Milk consumption (L/yr) | 2.330E+02 | 9.200E+01 | --- | DIET(3) |
| R018 | Meat and poultry consumption (kg/yr) | 6.500E+01 | 6.300E+01 | --- | DIET(4) |
| R018 | Fish consumption (kg/yr) | 2.100E+01 | 5.400E+00 | --- | DIET(5) |
| R018 | Other seafood consumption (kg/yr) | 9.000E-01 | 9.000E-01 | --- | DIET(6) |
| R018 | Soil ingestion rate (g/yr) | not used | 3.650E+01 | --- | SOIL |
| R018 | Drinking water intake (L/yr) | 4.600E+02 | 5.100E+02 | --- | DWI |
| R018 | Contamination fraction of drinking water | 1.000E+00 | 1.000E+00 | --- | FDW |
| R018 | Contamination fraction of household water | not used | 1.000E+00 | --- | FHHW |
| R018 | Contamination fraction of livestock water | 1.000E+00 | 1.000E+00 | --- | FLW |
| R018 | Contamination fraction of irrigation water | 1.000E+00 | 1.000E+00 | --- | FIRW |
| R018 | Contamination fraction of aquatic food | 1.000E+00 | 5.000E-01 | --- | FR9 |
| R018 | Contamination fraction of plant food | -1 | -1 | 0.500E+00 | FPLANT |
| R018 | Contamination fraction of meat | -1 | -1 | 0.646E-01 | FMEAT |
| R018 | Contamination fraction of milk | -1 | -1 | 0.646E-01 | FMLLK |
| R019 | Livestock fodder intake for meat (kg/day) | 1.200E+01 | 6.800E+01 | --- | LFI5 |
| R019 | Livestock fodder intake for milk (kg/day) | 9.000E+00 | 5.500E+01 | --- | LFI6 |
| R019 | Livestock water intake for meat (L/day) | 3.700E+01 | 5.000E+01 | --- | LWI5 |
| R019 | Livestock water intake for milk (L/day) | 1.050E+02 | 1.600E+02 | --- | LWI6 |
| R019 | Livestock soil intake (kg/day) | 4.500E-01 | 5.000E-01 | --- | LSI |
| R019 | Mass loading for foliar deposition (g/m**3) | 2.300E-05 | 1.000E-04 | --- | MLFD |
| R019 | Depth of soil mixing layer (m) | 1.500E-01 | 1.500E-01 | --- | DM |
| R019 | Depth of roots (m) | 9.000E-01 | 9.000E-01 | --- | DROOT |
| R019 | Drinking water fraction from ground water | 1.000E+00 | 1.000E+00 | --- | FGWDW |
| R019 | Household water fraction from ground water | not used | 1.000E+00 | --- | FGWHH |
| R019 | Livestock water fraction from ground water | 1.000E+00 | 1.000E+00 | --- | FGWLW |
| R019 | Irrigation fraction from ground water | 1.000E+00 | 1.000E+00 | --- | FGWIR |
| R19B | Wet weight crop yield for Non-Leafy (kg/m**2) | 1.750E+00 | 7.000E-01 | --- | YV(1) |
| R19B | Wet weight crop yield for Leafy (kg/m**2) | 1.500E+00 | 1.500E+00 | --- | YV(2) |
| R19B | Wet weight crop yield for Fodder (kg/m**2) | 1.100E+00 | 1.100E+00 | --- | YV(3) |
| R19B | Growing Season for Non-Leafy (years) | 2.600E-01 | 1.700E-01 | --- | TE(1) |
| R19B | Growing Season for Leafy (years) | 1.700E-01 | 2.500E-01 | --- | TE(2) |
| R19B | Growing Season for Fodder (years) | 2.100E-01 | 8.000E-02 | --- | TE(3) |
| R19B | Translocation Factor for Non-Leafy | 1.000E-01 | 1.000E-01 | --- | TIV(1) |
| R19B | Translocation Factor for Leafy | 1.000E+00 | 1.000E+00 | --- | TIV(2) |
| R19B | Translocation Factor for Fodder | 1.000E+00 | 1.000E+00 | --- | TIV(3) |
| R19B | Dry Foliar Interception Fraction for Non-Leafy | 2.500E-01 | 2.500E-01 | --- | RDRY(1) |
| R19B | Dry Foliar Interception Fraction for Leafy | 2.500E-01 | 2.500E-01 | --- | RDRY(2) |
| R19B | Dry Foliar Interception Fraction for Fodder | 2.500E-01 | 2.500E-01 | --- | RDRY(3) |
| R19B | Wet Foliar Interception Fraction for Non-Leafy | 2.500E-01 | 2.500E-01 | --- | RWET(1) |
| R19B | Wet Foliar Interception Fraction for Leafy | 6.000E-01 | 2.500E-01 | --- | RWET(2) |
| R19B | Wet Foliar Interception Fraction for Fodder | 2.500E-01 | 2.500E-01 | --- | RWET(3) |
| R19B | Weathering Removal Constant for Vegetation | 3.300E+01 | 2.000E+01 | --- | WLAM |
| C14 | C-12 concentration in water (g/cm**3) | not used | 2.000E-05 | --- | C12WTR |
| C14 | C-12 concentration in contaminated soil (g/g) | not used | 3.000E-02 | --- | C12CZ |
| C14 | Fraction of vegetation carbon from soil | not used | 2.000E-02 | --- | CSOIL |

Summary : Hematite - GW DSR Ra-226+C

File : C:\RESRAD_FAMILY\RESRAD\USERFILES\HEMATITE - GW DSR RA-226+C.RAD

Site-Specific Parameter Summary (continued)

| Menu | Parameter | User Input | Default | Used by RESRAD (If different from user input) | Parameter Name |
|------|--|------------|------------|--|----------------|
| C14 | Fraction of vegetation carbon from air | not used | 9.800E-01 | --- | CAIR |
| C14 | C-14 evasion layer thickness in soil (m) | not used | 3.000E-01 | --- | DMC |
| C14 | C-14 evasion flux rate from soil (1/sec) | not used | 7.000E-07 | --- | EVSN |
| C14 | C-12 evasion flux rate from soil (1/sec) | not used | 1.000E-10 | --- | REVSN |
| C14 | Fraction of grain in beef cattle feed | not used | 8.000E-01 | --- | AVFG4 |
| C14 | Fraction of grain in milk cow feed | not used | 2.000E-01 | --- | AVFG5 |
| STOR | Storage times of contaminated foodstuffs (days): | | | | |
| STOR | Fruits, non-leafy vegetables, and grain | 1.400E+01 | 1.400E+01 | --- | STOR_T(1) |
| STOR | Leafy vegetables | 1.000E+00 | 1.000E+00 | --- | STOR_T(2) |
| STOR | Milk | 1.000E+00 | 1.000E+00 | --- | STOR_T(3) |
| STOR | Meat and poultry | 2.000E+01 | 2.000E+01 | --- | STOR_T(4) |
| STOR | Fish | 7.000E+00 | 7.000E+00 | --- | STOR_T(5) |
| STOR | Crustacea and mollusks | 7.000E+00 | 7.000E+00 | --- | STOR_T(6) |
| STOR | Well water | 1.000E+00 | 1.000E+00 | --- | STOR_T(7) |
| STOR | Surface water | 1.000E+00 | 1.000E+00 | --- | STOR_T(8) |
| STOR | Livestock fodder | 4.500E+01 | 4.500E+01 | --- | STOR_T(9) |
| R021 | Thickness of building foundation (m) | not used | 1.500E-01 | --- | FLOOR1 |
| R021 | Bulk density of building foundation (g/cm**3) | not used | 2.400E+00 | --- | DENSFL |
| R021 | Total porosity of the cover material | not used | 4.000E-01 | --- | TPCV |
| R021 | Total porosity of the building foundation | not used | 1.000E-01 | --- | TPFL |
| R021 | Volumetric water content of the cover material | not used | 5.000E-02 | --- | PH2OCV |
| R021 | Volumetric water content of the foundation | not used | 3.000E-02 | --- | PH2OFL |
| R021 | Diffusion coefficient for radon gas (m/sec): | | | | |
| R021 | in cover material | not used | 2.000E-06 | --- | DIFCV |
| R021 | in foundation material | not used | 3.000E-07 | --- | DIFFL |
| R021 | in contaminated zone soil | not used | 2.000E-06 | --- | DIFCZ |
| R021 | Radon vertical dimension of mixing (m) | not used | 2.000E+00 | --- | HMIX |
| R021 | Average building air exchange rate (1/hr) | not used | 5.000E-01 | --- | REXG |
| R021 | Height of the building (room) (m) | not used | 2.500E+00 | --- | HRM |
| R021 | Building interior area factor | not used | 0.000E+00 | --- | FAI |
| R021 | Building depth below ground surface (m) | not used | -1.000E+00 | --- | DMFL |
| R021 | Emanating power of Rn-222 gas | not used | 2.500E-01 | --- | EMANA(1) |
| R021 | Emanating power of Rn-220 gas | not used | 1.500E-01 | --- | EMANA(2) |
| TITL | Number of graphical time points | 128 | --- | --- | NPTS |
| TITL | Maximum number of integration points for dose | 5 | --- | --- | LYMAX |
| TITL | Maximum number of integration points for risk | 1 | --- | --- | KYMAX |

Summary : Hematite - GW DSR Ra-226+C

File : C:\RESRAD_FAMILY\RESRAD\USERFILES\HEMATITE - GW DSR RA-226+C.RAD

Summary of Pathway Selections

| Pathway | User Selection |
|-----------------------------|----------------|
| 1 -- external gamma | suppressed |
| 2 -- inhalation (w/o radon) | suppressed |
| 3 -- plant ingestion | active |
| 4 -- meat ingestion | active |
| 5 -- milk ingestion | active |
| 6 -- aquatic foods | active |
| 7 -- drinking water | active |
| 8 -- soil ingestion | suppressed |
| 9 -- radon | suppressed |
| Find peak pathway doses | active |

Summary : Hematite - GW DSR Ra-226+C

File : C:\RESRAD_FAMILY\RESRAD\USERFILES\HEMATITE - GW DSR RA-226+C.RAD

| Contaminated Zone Dimensions | | Initial Soil Concentrations, pCi/g | |
|------------------------------|-----------------------|------------------------------------|-----------|
| Area: | 1292.00 square meters | Pb-210 | 1.000E+00 |
| Thickness: | 5.20 meters | Ra-226 | 1.000E+00 |
| Cover Depth: | 1.50 meters | | |

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

| | | |
|------------|-----------|-----------|
| t (years): | 0.000E+00 | 1.000E+00 |
|------------|-----------|-----------|

| | | |
|-----------|-----------|-----------|
| TDOSE(t): | 4.786E-01 | 4.786E-01 |
|-----------|-----------|-----------|

| | | |
|-------|-----------|-----------|
| M(t): | 1.914E-02 | 1.914E-02 |
|-------|-----------|-----------|

Maximum TDOSE(t): 4.786E-01 mrem/yr at t = 0.000E+00 years

Summary : Hematite - GW DSR Ra-226+C

File : C:\RESRAD_FAMILY\RESRAD\USERFILES\HEMATITE - GW DSR RA-226+C.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

| Radio- Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|-------------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|
| | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

| Radio- Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All Pathways* | |
|-------------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|
| | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. |
| Pb-210 | 3.353E-01 | 0.7006 | 1.019E-01 | 0.2129 | 0.000E+00 | 0.0000 | 1.545E-02 | 0.0323 | 1.189E-04 | 0.0002 | 6.947E-04 | 0.0015 | 4.535E-01 | 0.9475 |
| Ra-226 | 1.931E-02 | 0.0403 | 4.884E-03 | 0.0102 | 0.000E+00 | 0.0000 | 8.901E-04 | 0.0019 | 6.916E-06 | 0.0000 | 3.321E-05 | 0.0001 | 2.512E-02 | 0.0525 |
| Total | 3.546E-01 | 0.7409 | 1.068E-01 | 0.2232 | 0.000E+00 | 0.0000 | 1.634E-02 | 0.0341 | 1.258E-04 | 0.0003 | 7.279E-04 | 0.0015 | 4.786E-01 | 1.0000 |

*Sum of all water independent and dependent pathways.

Summary : Hematite - GW DSR Ra-226+C

File : C:\RESRAD_FAMILY\RESRAD\USERFILES\HEMATITE - GW DSR RA-226+C.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

| Radio- Nuclide | Ground | | Inhalation | | Radon | | Plant | | Meat | | Milk | | Soil | |
|-------------------|-----------|--------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. |
| Pb-210 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Ra-226 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |
| Total | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 | 0.000E+00 | 0.0000 |

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

| Radio- Nuclide | Water | | Fish | | Radon | | Plant | | Meat | | Milk | | All Pathways* | |
|-------------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|---------------|--------|
| | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. | mrem/yr | fract. |
| Pb-210 | 3.250E-01 | 0.6792 | 9.880E-02 | 0.2064 | 0.000E+00 | 0.0000 | 1.498E-02 | 0.0313 | 1.153E-04 | 0.0002 | 6.734E-04 | 0.0014 | 4.396E-01 | 0.9185 |
| Ra-226 | 2.956E-02 | 0.0618 | 7.996E-03 | 0.0167 | 0.000E+00 | 0.0000 | 1.362E-03 | 0.0028 | 1.053E-05 | 0.0000 | 5.444E-05 | 0.0001 | 3.898E-02 | 0.0815 |
| Total | 3.546E-01 | 0.7409 | 1.068E-01 | 0.2231 | 0.000E+00 | 0.0000 | 1.634E-02 | 0.0341 | 1.258E-04 | 0.0003 | 7.279E-04 | 0.0015 | 4.786E-01 | 1.0000 |

*Sum of all water independent and dependent pathways.

Summary : Hematite - GW DSR Ra-226+C

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Dose/Source Ratios Summed Over All Pathways

Parent and Progeny Principal Radionuclide Contributions Indicated

| Parent (i) | Product (j) | Thread Fraction | DSR(j,t) 0.000E+00 | At Time in Years 1.000E+00 | (mrem/yr)/(pCi/g) |
|---------------|----------------|--------------------|-----------------------|-------------------------------|-------------------|
| Pb-210+D | Pb-210+D | 1.000E+00 | 4.535E-01 | 4.396E-01 | |
| Ra-226+D | Ra-226+D | 1.000E+00 | 4.276E-03 | 4.274E-03 | |
| Ra-226+D | Pb-210+D | 1.000E+00 | 2.085E-02 | 3.471E-02 | |
| Ra-226+D | ∑DSR(j) | | 2.512E-02 | 3.898E-02 | |

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

| Nuclide (i) | t= 0.000E+00 | 1.000E+00 |
|----------------|--------------|-----------|
| Pb-210 | 5.513E+01 | 5.687E+01 |
| Ra-226 | 9.951E+02 | 6.413E+02 |

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)

and Single Radionuclide Soil Guidelines G(i,t) in pCi/g

at tmin = time of minimum single radionuclide soil guideline

and at tmax = time of maximum total dose = 0.000E+00 years

| Nuclide (i) | Initial (pCi/g) | tmin (years) | DSR(i,tmin) | G(i,tmin) (pCi/g) | DSR(i,tmax) | G(i,tmax) (pCi/g) |
|----------------|--------------------|-----------------|-------------|----------------------|-------------|----------------------|
| Pb-210 | 1.000E+00 | 0.000E+00 | 4.535E-01 | 5.513E+01 | 4.535E-01 | 5.513E+01 |
| Ra-226 | 1.000E+00 | 1.000E+00 | 3.898E-02 | 6.413E+02 | 2.512E-02 | 9.951E+02 |

Summary : Hematite - GW DSR Ra-226+C

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Individual Nuclide Dose Summed Over All Pathways

Parent Nuclide and Branch Fraction Indicated

| Nuclide (j) | Parent (i) | THF(i) | DOSE(j,t), mrem/yr | |
|----------------|---------------|-----------|--------------------|-----------|
| | | | t= 0.000E+00 | 1.000E+00 |
| Pb-210 | Pb-210 | 1.000E+00 | 4.535E-01 | 4.396E-01 |
| Pb-210 | Ra-226 | 1.000E+00 | 2.085E-02 | 3.471E-02 |
| Pb-210 | ΣDOSE(j) | | 4.743E-01 | 4.743E-01 |
| Ra-226 | Ra-226 | 1.000E+00 | 4.276E-03 | 4.274E-03 |

THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration

Parent Nuclide and Branch Fraction Indicated

| Nuclide (j) | Parent (i) | THF(i) | S(j,t), pCi/g | |
|----------------|---------------|-----------|---------------|-----------|
| | | | t= 0.000E+00 | 1.000E+00 |
| Pb-210 | Pb-210 | 1.000E+00 | 1.000E+00 | 9.694E-01 |
| Pb-210 | Ra-226 | 1.000E+00 | 0.000E+00 | 3.060E-02 |
| Pb-210 | ΣS(j): | | 1.000E+00 | 1.000E+00 |
| Ra-226 | Ra-226 | 1.000E+00 | 1.000E+00 | 9.996E-01 |

THF(i) is the thread fraction of the parent nuclide.

RESRAD.EXE execution time = 1.45 seconds