Scenario: PRG calculation for benzo[a]pyrene in soil for an individual exposed by the ingestion pathway for 30 years, starting at birth, (the standard scenario for an RME resident). The calculation is based on a target cancer risk of 1E-06.

Note, this example uses the USEPA (1991) recommended standard default exposure parameters for a RME resident.

General PRG Equation:

$$PRG \ (mg/kg) \ = \ \frac{AT * Target \ Risk}{(CF * SF) * [\ \sum_{i=a}^{d} (IR_i \ / \ BW_i \ ) * ED_i * EF_i * ADAF_i)]}$$

Inputs:

Parameter	Units	PARAMTERS (by age interval, i)			
		0-<2	2-<6	6-<16	16-<30
Target Risk	(unitless)	1.00E-06	1.00E-06	1.00E-06	1.00E-06
IR	(mg/day)	200	200	100	100
CF	(kg/mg)	1.0E-06	1.0E-06	1.0E-06	1.0E-06
BW	(kg)	15	15	70	70
EF	(days/year)	350	350	350	350
ED	(years)	2	4	10	14
AT	(days)	25,550	25,550	25,550	25,550
SF_{oral}	(mg/kg-day)-1	7.3E+00	7.3E+00	7.3E+00	7.3E+00
ADAF	(unitless)	10	3	3	1

Note: Alternate age bins may be considered to address site-specific exposure scenarios.

PRG Calculation:

$$PRG \ (mg/kg) = \frac{AT * Target \ Risk}{(CF * SF) * [\ ((IR_{0-<2}/BW_{0-<2}) * EF_{0-<2} * ED_{0-<2} * ADAF_{0-<2}) + ((IR_{2-<6}/BW_{2-<6}) * EF_{2-<6} * ED_{2-<6} * ADAF_{2-<6}) + ((IR_{6-<16}/BW_{6-<16}) * EF_{6-<16} * ED_{6-<16} * ADAF_{6-<16}) + ((IR_{16-<30}/BW_{16-<30}) * EF_{16-<30} * ED_{16-<30} * ADAF_{16-<30})]}$$

$$PRG \ (mg/kg) = \frac{25,550 * 1E-06}{(1E-06 * 7.3E+00) * [\ ((200/15) * 350 * 2 * 10) + ((200/15) * 350 * 4 * 3) + ((100/70) * 350 * 10 * 3) + ((100/70) * 350 * 14 * 1)]}$$

PRG (mg/kg) =   0.020

References:

USEPA 1991. Standard Default Exposure Factors. OSWER Directive 9285.6-03

Scenario: PRG calculation for benzo[a]pyrene in water for an individual exposed by the ingestion pathway for 30 years, starting at birth, (the standard scenario for an RME resident). The calculation is based on a target cancer risk of 1E-06.

Note, this example uses the USEPA (1991) recommended standard default exposure parameters for a RME resident.

General PRG Equation:

$$PRG\ (ug/L)\ =\ \frac{AT * Target\ Risk}{(CF * SF) * [\ \sum_{i=a}^{d}((IR_i\ /\ BW_i\ ) * ED_i * EF_i * ADAF_i)]}$$

Inputs:

Parameter	Units	0-<2	2-<6	6-<16	16-<30
		PARAMTERS (by age interval, i)			
Target Risk	(unitless)	1.0E-06	1.0E-06	1.0E-06	1.0E-06
CF	(mg/ug)	1.0E-03	1.0E-03	1.0E-03	1.0E-03
IR	(L/day)	1	1	2	2
BW	(kg)	15	15	70	70
EF	(days/year)	350	350	350	350
ED	(years)	2	4	10	14
AT	(days)	25,550	25,550	25,550	25,550
SF_{oral}	(mg/kg-day)-1	7.3E+00	7.3E+00	7.3E+00	7.3E+00
ADAF	(unitless)	10	3	3	1

Note: Alternate age bins may be considered to address site-specific exposure scenarios.

PRG Calculation:

$$PRG\ (ug/L) = \frac{AT * Target\ Risk}{(CF * SF) * [\ ((IR_{0-<2}/BW_{0-<2}) * EF_{0-<2} * ED_{0-<2} * ADAF_{0-<2}) + ((IR_{2-<6}/BW_{2-<6}) * EF_{2-<6} * ED_{2-<6} * ADAF_{2-<6}) + ((IR_{6-<16}/BW_{6-<16}) * EF_{6-<16} * ED_{6-<16} * ADAF_{6-<16}) + ((IR_{16-<30}/BW_{16-<30}) * EF_{16-<30} * ED_{16-<30} * ADAF_{16-<30})\ ]}$$

$$PRG\ (ug/L) = \frac{25,550 * 1E-06}{(1E-03 * 7.3E+00) * [\ ((1/15) * 350 * 2 * 10) + ((1/15) * 350 * 4 * 3) + ((2/70) * 350 * 10 * 3) + ((2/70) * 350 * 14 * 1)\ ]}$$

$$PRG\ (ug/L) =\ 0.0029$$

References:
USEPA 1991. Standard Default Exposure Factors. OSWER Directive 9285.6-03