



Sellafield Ltd

EHS&Q Environmental Strategy and Standards

Sellafield Discharges and Environmental Monitoring 2009 – A Preliminary Assessment

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EHS&Q Environmental Strategy and Standards

Provisional Terrestrial dose for 2009

- Critical Group as in previous years is Infants
 - Main contribution is from ^{90}Sr and ^{129}I
- Provisional dose estimate for 2009 is 16.3 $\mu\text{Sv}/\text{year}$
 - The provisional estimate in 2008 was 16.9 $\mu\text{Sv}/\text{year}$
 - The final assessment for 2008 was 20 $\mu\text{Sv}/\text{year}$
 - Estimate does not include external contribution, minor food pathways, marine foods, uses 2008 habit data
 - Dose from ^{106}Ru and ^{131}I based on LoD data rather than modelled (6.3 $\mu\text{Sv}/\text{year}$ and 2.2 $\mu\text{Sv}/\text{year}$ respectively)

Provisional Marine dose for 2009

- Provisional dose estimate for 2009 is 137 $\mu\text{Sv}/\text{year}$
 - The provisional estimate in 2008 was 170 $\mu\text{Sv}/\text{year}$
 - The final assessment for 2008 was 161 $\mu\text{Sv}/\text{year}$
 - Estimate uses 2008 habit data
 - Main difference is due to lower concentrations of actinides in Winkles (approx 60% of 2008 level)
- Critical Group as in previous years is Adults
 - Main pathways are Mussels and Winkles
 - 75.6 $\mu\text{Sv}/\text{year}$ and 42.7 $\mu\text{Sv}/\text{year}$ respectively
 - Main contribution is from actinides – Pu alpha and ^{241}Am
 - 40.7 $\mu\text{Sv}/\text{year}$ and 67.5 $\mu\text{Sv}/\text{year}$ respectively

Aerial Discharges 2009

- Discharges similar to 2008 levels except for ^{125}Sb
- Site and FHP breaching ^{125}Sb rolling 12 month limit since July 2009
- Revised limits effective April 2010
- Overall dose impact for discharges at limit has reduced following changes in April 2010

Year	2008	2009
H-3 MBq	1.41E+08	1.88E+08
C-14 MBq	6.86E+05	3.79E+05
Kr-85 MBq	2.57E+10	4.17E+10
Sr-90 MBq	3.77E+01	3.85E+01
Ru-106 MBq	1.39E+03	9.70E+02
Sb-125 MBq	3.61E+03	1.13E+04
Rn-222 MBq	3.20E+04	4.26E+04
I-129 MBq	5.74E+03	7.62E+03
I-131 MBq	6.26E+02	6.90E+02
Cs-137 MBq	1.31E+02	1.22E+02
Pu-Alpha MBq	2.27E+01	2.86E+01
Pu-241 MBq	2.62E+02	3.57E+02
Am-241+Cm242 MBq	1.71E+01	1.85E+01
Alpha MBq	1.10E+02	9.84E+01
Beta MBq	1.45E+03	1.42E+03

Marine Discharges 2009

- Increased Thorp and Magnox throughputs
 - Thorp 196 te (104 te 2008)
 - Magnox 538 te (430 te 2008)
- ^{90}Sr and ^{106}Ru increase due to treatment of MAC in EARP

Year	2008	2009
H-3 GBq	7.8E+05	1.5E+06
C-14 GBq	7.2E+03	8.2E+03
Co-60 GBq	7.2E+01	8.2E+01
Sr-90 GBq	1.7E+03	2.9E+03
Zr+Nb-95 GBq	1.2E+02	1.9E+02
Tc-99 GBq	2.4E+03	3.1E+03
Ru-106 GBq	1.4E+03	3.2E+03
I-129 GBq	2.0E+02	2.5E+02
Cs-134 GBq	1.2E+02	1.4E+02
Cs-137 GBq	5.1E+03	4.3E+03
Ce-144 GBq	3.5E+02	5.0E+02
Np-237 GBq	4.3E+01	5.2E+01
Pu-Alpha GBq	1.1E+02	1.2E+02
Pu-241 GBq	2.4E+03	2.9E+03
Am-241 GBq	3.0E+01	4.6E+01
Cm-243+244 GBq	2.9E+00	4.5E+00
Alpha GBq	1.3E+02	1.5E+02
Beta/Beta-5 GBq	1.4E+04	1.8E+04
Uranium Kg	2.8E+02	4.1E+02