NDAWG
National Dose Assessment Working Group

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UPDATE of NDAWG/1/2019

Short-term Releases to the Atmosphere technical methods and examples

NDAWG Short-term Release Sub-group

Change history

Version	Date	Changes
NDAWG/1/2010	2010	-
NDAWG/1/2019	Nov 2019	All guidance on short term release assessments have been removed from this document and reference made to NDAWG guidance on short term releases (Guidance Note 6). Document updated regarding most recent regulations. Activity concentrations of ^{14}C and ^{35}S in foods have been recalculated using the FSA PRISM model. Updated activity concentrations are given in Tables A3 and A4. Revised doses are presented in Tables A11 to A21 (excluding continuous release results which have not changed) and Figures 3 to 14. Individual doses for scenario 2 and 3 added in Tables A22 to A39. A summary of the changes made is given in Appendix B.
NDAWG/1/2020	Jun 2020	Correction to Figures 3 to 11 and Tables A10 to A39 for ^{3}H

The views presented in this paper are those of the authors in consultation with members of NDAWG. They represent the views of the majority of members of NDAWG but do not necessarily reflect the views of the organisations from which the members are drawn. This report has been updated by the Practitioner Group on the Impact of Radioactivity in the Environment which has representatives from Public Health England, Environment Agency, Scottish Environment Protection Agency, Office for Nuclear Regulation, Food Standards Agency and Food Standards Scotland.

SUMMARY

In 2011 the NDAWG short-term release sub-group produced general guidance for assessing doses from short-term releases to atmosphere to inform the process of determining the need for short-term limits or notification levels. Included in this guidance were key parameter assumptions for realistic and cautious assessments of short-term releases to atmosphere.

This report provides example assessments using the guidance. Doses[1] per unit release for short-term releases to the atmosphere were calculated for key radionuclides using the recommended realistic and cautious assumptions. In addition, two case studies were considered in which doses to members of the public living near to an Advanced Gas-cooled Reactor (AGR) and a cyclotron were estimated based on reported discharges. The dose per unit release results and the case studies showed that where there are limits in place, that are typically an order of magnitude less than the authorised annual discharge limits (eg, monthly limits), estimates of dose using a **realistic** short-term release assessment described here for a single release are unlikely to be more than a factor of three greater than those estimated from a continuous release assessment. In other words, these short-term limits act as intended and reduce the maximum quantity of activity that can be discharged in a short period of time. Where there are only annual limits in place, **and it is cautiously assumed that discharges occur at these limits over a short period of time**, then doses from the assessment of a **single realistic** short-term release are a factor of about 20 greater than doses from the continuous release assessment.

This report contains revised predicted ^{14}C and ^{35}S activity concentrations in food using an updated foodchain model.

[1] In this report the term dose is used to refer to effective dose and is the sum of the annual external effective dose and the committed effective dose for intakes over a year. The exposure pathways included are those of most radiological significance for the radionuclides considered.

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1 INTRODUCTION

1.1 Responsibility for granting a permit or authorisation to discharge radioactive wastes to the environment rests with the Environment Agency, Natural Resources Wales (NRW), the Scottish Environment Protection Agency (SEPA) and the Northern Ireland Environment Agency (collectively referred to as the Environment Agencies). The legislation for issuing permits or authorisations are the Environmental Permitting Regulations 2016 (as amended in 2018) in England and Wales; Environmental Authorisations (Scotland) Regulations 2018; and the Radioactive Substances Act 1993 (RSA 93) as amended by The Radioactive Substances (Modification of Enactments) Regulations (Northern Ireland) 2018.

1.2 The Euratom Basic Safety Standards (BSS) Directive 2013 [Ref 1] requires member states to ensure that specified dose limits for the public are not exceeded.

1.3 The Environmental Permitting Regulations 2016 [Ref 2] and a direction on the Scottish Environment Protection Agency (SEPA) [Ref 3] require these Environment Agencies to ensure that doses to reference groups of the public do not exceed specified dose limits and constraints, in discharging their functions in relation to regulations relevant to the disposal of radioactive waste; equivalent legislation is in force in Northern Ireland [Ref 4].

1.4 The Environment Agency, Scottish Environment Protection Agency and the Department of Environment in Northern Ireland (now Northern Ireland Environment Agency) in collaboration with the Food Standards Agency and the Health Protection Agency (now Public Health England) have developed principles and guidance for the prospective assessment of public doses [Ref 5]. One of these principles requires the assessment of operational (i.e. routine, planned or reasonably foreseeable) short-term releases of radionuclides. Operational short-term releases that are higher than annual average releases, can occur for a number of reasons, including variations in site production, restricted nuclear medicine treatment days within hospitals, fuel cladding problems in reactors or particular projects (e.g. decommissioning activities, research using particular radionuclides).

1.4 The National Dose Assessment Working Group issued guidance in 2011 on the assessment of short term releases to atmosphere [Ref 6]. The purpose of this report is to provide example assessments, using the NDAWG guidance, of doses from planned short-term releases to inform the process of proposing or setting short-term limits or notification discharge levels.

2 PATTERN OF DISCHARGES TO THE ATMOSPHERE

2.1 Radioactive discharges to the atmosphere occur from both nuclear and non-nuclear sites with the majority of sites being non-nuclear. In the UK these discharges are authorised through a system of permitting. In England and Wales alone there are several hundred premises with permitted discharges of radioactive substances to air.

2.2 Permits for radioactive discharges from nuclear sites generally have annual rolling discharge limits, with some also having quarterly notification levels (QNL) and/or weekly advisory levels (WAL). Most non-nuclear discharge permits and authorisations have monthly limits (ML). Some authorisations have daily limits (DL) and 12-month limits.

2.3 Patterns of discharge for an Advanced Gas Reactor (AGR) nuclear power plant and a cyclotron are shown in Figures 1 and 2 for illustrative purposes.

2.4 As well as variations in the magnitude of discharges over time, there is the potential for variations in the chemical form of the radionuclide that is released. This may result, for example, from the production of different batches of radiopharmaceuticals. This is not considered in this guidance but may need to be addressed if a detailed site specific assessment is necessary.

3 ASSESSMENT METHODOLOGY

3.1 In this report the term dose is used to refer to the effective dose and is the sum of the annual external effective dose and the committed effective dose for intakes occurring in a single year. The exposure pathways included are those of most radiological significance for the radionuclides considered. It is acknowledged that for a continuous release assessment the dose in the 50th year from 50 years of discharge is usually assessed to account for accumulation of radionuclides in the environment. However, the most significant contribution to the annual dose from a short-term release is from exposures that occur during the year when the release takes place because there is no subsequent build up in the relevant parts of the environment. Consequently, if a single short-term release occurs every year for 50 years there is little difference in the annual dose in the first year compared to the 50th year. This contrasts with the annual dose received in the first and 50th years for continuous releases, particularly where the main contribution to the dose is from exposure to radioactive material deposited on the ground. For example, the annual doses to an adult in the 50th year of a continuous release for ^{60}Co and ^{137}Cs are approximately an order of magnitude higher than those calculated in the first year.

3.2 Dose per unit short-term release values were calculated for a range of radionuclides. Three release scenarios were considered (Section 4.1) and both realistic and cautious assessment assumptions from the NDAWG short term release guidance [Ref 6] were used. Further details of the methodology are given in Appendix A.

3.3 The methodology used to calculate dose per unit release values from short-term releases is based on the approach described in NRPB-W54 [Ref 7]. However, the radionuclides discharged by a cyclotron are not included in some of the models used in Reference 7 and therefore a simplified methodology was developed to assess the doses arising from these discharges (Appendix A). The methodology for calculating dose per unit release values from continuous releases uses ADMS 4 [Ref 8] and PC CREAM [Ref 9].

3.4 The realistic annual dose to individual members of the public for a short-term release of a particular radionuclide may be calculated by multiplying the quantity of activity released in the short-term release (Bq), by the realistic dose per unit short-term release value (Sv Bq^{-1}) provided in this report. However, dose per unit release values are only available for certain radionuclides and specific short-term release scenarios based on Section 4.1 and the assumptions from the NDAWG short term release guidance [Ref 6]. If the scenario to be modelled differs significantly from these assumptions then the dose per unit release values provided in this report cannot be used; instead it is necessary to use the models and methods described in this report to calculate more appropriate doses.

3.5 The annual dose to individual members of the public for a continuous release of a particular radionuclide may be calculated by multiplying the annual discharge of activity (Bq y^{-1}) by the appropriate dose per unit continuous release value (Sv Bq y^{-1}). Doses arising from the residual continuous discharges that occur in addition to a short-term release may be calculated in the same way.

4 GENERIC RELEASE SCENARIOS

4.1 Doses were assessed for three generic short-term release scenarios to compare to the doses assuming a continuous release:

- ***Scenario 1 – 12-month limits only***. All radionuclides released at 1 TBq (representing 12-month limits) in a short-term release. No further discharges for the remainder of the year.
- ***Scenario 2 – QNL***. All radionuclides cautiously released at 0.25 TBq (representing quarterly notification levels) in a single short-term release. Remainder of 12-month limits (ie 0.75 TBq) released continuously over the rest of the year.
- ***Scenario 3 – ML***. All radionuclides cautiously released at 0.083 TBq (representing monthly limits) in a single short-term release. Remainder of 12-month limits (ie 0.917 TBq) released continuously over the rest of the year.

4.2 It should be noted that scenario 1 enables a comparison to be made of the different levels of caution for the situation where radionuclides are released entirely within a short period of time and there is no further continuous release of the radionuclides over the subsequent 12 months. In reality, it may be unrealistic to assume that all the radionuclides are released at the 12-month limit in a short period of time. In NDAWG short term release guidance [Ref 6] it is advised that expected or planned short-term discharges be used for realistic assessments where only 12-month limits exist. If information on these expected releases is not available, and no short-term limits have been set, then it is really only possible to carry out a more cautious assessment.

4.3 The source terms for the three scenarios are shown in Table 1. The total short-term release source terms (short-term plus remaining continuous release throughout the year) and the continuous release source term equate to a unit release of 1 TBq.

4.4 For all release scenarios it is assumed that individuals live 100 m from the discharge point where they receive doses from inhalation and external exposure and that their food is derived from a location 500 m from the source from which they receive an ingestion dose.

4.5 For each scenario doses from short-term releases were assessed for three different sets of assumptions, one realistic and the other two cautious (NDAWG short term release guidance [Ref 6] and Table A1). Two sets of meteorological conditions (Table A1) are used to scope the potential impact of what would be considered as a cautious assessment. For example, for scenario 1:

- ***Scenario 1a (realistic)*** – assumes unit release over 12 hours but otherwise use realistic assumptions from NDAWG short term release guidance [Ref 6] and realistic neutral meteorological conditions from Table A1.
- ***Scenario 1b (cautious)*** – assumes unit release over 30 minutes but otherwise use cautious assumptions from NDAWG short term release guidance [Ref 6] and cautious neutral meteorological conditions from Table A1.

- ***Scenario 1c (cautious)*** – assumes unit release over 30 minutes but otherwise use cautious assumptions from NDAWG short term release guidance [Ref 6] and stable meteorological conditions from Table A1.

4.6 The continuous release assessment uses a range of meteorological conditions with different frequencies of occurrence and a uniform windrose (Table A1).

Scenario 1a

4.7 Doses assessed for members of the public for the realistic short-term release (scenario 1a) are shown in Tables A10, A14 and A18 of Appendix A. The ratios of short-term to continuous doses for adults, children and infants, as a function of radionuclide, are shown in Figures 3 to 5. These results suggest that the realistic short-term discharge assessment predicts doses that are about an order of magnitude greater than those estimated using the continuous discharge assessment for the same unit release of activity. In general, the ratios do not vary greatly between the age groups considered for a given radionuclide. The variation seen between radionuclides arises as a result of the relative importance of different exposure pathways and the half-life of the radionuclide. The situation is complicated by the fact that it was necessary in some cases to use different models to predict uptake of radionuclides by plants and animals because the models for continuous releases are not suitable over shorter release durations. For ^{3}H and ^{14}C specific activity models are used for continuous releases while for short-term releases the models TRIF [Ref 10] and PRISM [Ref 11] were used, respectively. PRISM was also used for ^{35}S as it was better able to represent the gaseous forms of sulphur that are discharged during short-term blow down events which form part of gas cooled reactor maintenance. For ^{35}S the dose ratios (i.e. the ratio of dose from a short duration release to dose from a continuous release) are less than a factor of 10 and for infants less than or equal to a factor of one. This is a combination of the fact that the model used to predict ^{35}S concentrations in milk and milk products for a continuous release is more conservative than the model used for short-term releases; and for short-term releases milk products are excluded from the realistic dose assessment. However, where more direct comparisons can be made, e.g., for ^{85}Kr and ^{133}Xe where exposures are due entirely to direct irradiation from the radioactive plume, it can be seen that the doses from short duration releases are about a factor of 12 higher than from continuous releases. This is mainly due to the impact of the meteorological conditions assumed for each scenario.

4.8 Additional factors need to be taken into account depending on the exposure pathway being considered. These factors are meteorological conditions, habits, inhalation rates and variations in exposure routes. When comparing doses for exposures that occur following deposition onto the ground it must be recognised that not all the meteorological conditions used for the continuous release scenario include wet deposition (Table A1). The fraction of time during which wet deposition is assumed to occur for a continuous release is about 8% whereas for the realistic short-term release it is assumed to be raining all the time but at a low rate. This rainfall rate is based on the findings of report NRPB-W54 [Ref 7]. An investigation of the impact of different rainfall rates (including dry periods) and durations would require these events to be modelled independently and a weighted average of the results to be taken, however, this has not been done in this report. For a dry deposition velocity of 1 10^{-3} m s^{-1} it is estimated that at 100 m and 500 m from the site the total deposition for the realistic case is about a factor of 2 greater than that for the continuous case. This factor clearly impacts on the doses from exposure pathways related to the deposition of radionuclides, i.e., ingestion of foods, external exposure and inhalation of resuspended material. Differences in assumptions made about habit data also affect the doses calculated. The relative importance of these differences is radionuclide dependent. For example, the exclusion of milk products from the realistic assessment is an important consideration for doses from iodine.

Specifically, the dose to adults from ingestion of ^{129}I in milk products at an average intake rate of 20 kg y^{-1} would amount to about 3 10^4 µSv for realistic scenario 1a. The difference in inhalation rates used during the passage of the plume for realistic (1.2 m^3 hr^{-1}) and continuous (0.92 m^3 hr^{-1}) assessments would account for a reduction of about 25% in the estimated inhalation dose if the latter were used in realistic scenario 1a and this may be important for actinides.

Scenario 1b

4.9 Doses assessed for members of the public for the cautious (neutral met conditions) short-term release (scenario 1b) are shown in Tables A11, A15 and A19 of Appendix A. The ratios of short-term to continuous doses for adults, children and infants, as a function of radionuclide, are shown in Figures 3 to 5. These results suggest that the cautious (neutral met conditions) short-term discharge assessment predicts doses that are between about one and two orders of magnitude greater than those estimated from the continuous discharge assessment depending on the radionuclide under consideration. In general, the ratios do not vary greatly over the age groups considered for a given radionuclide and the variation as a function of radionuclide is similar to that for the realistic scenario. Once again, the dose ratios for ^{35}S are much lower for the reasons identified in paragraph 4.7. The overall increase in the dose ratio can be explained when differences between the realistic and cautious (neutral met conditions) assessment methodologies are considered. The cautious assessment includes enhanced wet deposition and an increase in the release rate albeit over a shorter period of time. This increases the total deposition by a factor of about 2 at 100 m and 4 at 500 m for a dry deposition velocity of 1 10^{-3} m s^{-1}. In addition, doses from direct inhalation and external exposure to the plume both increase by factors of between 1 and 2. The inclusion of peak activity concentrations in vegetables means that concentrations in green vegetables, where direct deposition is important, are likely to be a factor of 20 greater than the integrated activity concentrations used in the realistic assessment and this results in a factor of 3 increase in total dose for some radionuclides such as ^{131}I. The inclusion of milk products in the cautious dose assessment increases the total dose for some radionuclides, in particular the contribution from ^{129}I to the total ^{129}I cautious assessment dose increases by about 25%. The increased inhalation rate for adults during the passage of the plume would increase the inhalation dose by about 40% compared to that estimated for the realistic assessment. The fraction of time spent indoors during the passage of the plume is zero for the cautious assessment and this could increase doses from external exposure to the plume by factors of about 2, 3 and 4 for adults, children and infants, respectively, in comparison to the realistic assessment.

Scenario 1c

4.10 Doses assessed for members of the public for the cautious (stable met conditions) short-term release (scenario 1c) are shown in Tables A12, A16 and A20 of Appendix A. The ratios of short-term to continuous doses for adults, children and infant, as a function of radionuclide are shown in Figures 3 to 5. These results suggest that the cautious (stable met conditions) short-term discharge assessment predicts doses that are consistently two orders of magnitude greater than those estimated using the continuous discharge assessment. In general, the ratios do not vary greatly over the age groups and distances considered for a given radionuclide and the variation as a function of radionuclide is similar to that for the other two scenarios. The further increase in this ratio compared with the cautious (neutral met conditions) scenario is due to the reduced dispersion of the plume in the stable meteorological conditions which, even without the contribution from rainfall, can lead to greater levels of deposition. More specifically, this increases the total deposition by a factor of about 2 at 100 m although there is little difference at 500 m for a dry deposition velocity of 1 10^{-3} m s^{-1}. In addition, doses from direct inhalation and external exposure to the plume both increase by factors of about 4 and 3 respectively. The dose ratios for ^{35}S are much lower than for other radionuclides for the reasons identified in paragraph 4.7.

Scenarios 2 and 3

4.11 For scenarios 2 and 3 the doses assessed for a short-term release (including the continuously released remainder) expressed as a ratio of the doses from a continuous release assessment are shown in Figures 6 to 11 for adults, children and infants. Figures 6 to 8 show that doses from a short-term realistic release assessment are unlikely to exceed those from a continuous release assessment by more than a factor of 10 when QNLs are in place and by a factor of 3 when monthly notification levels are in place (Figures 9 to 11). These differences show the impact of reducing the levels of discharge used in the short-term release source term. They also demonstrate that where MLs are in place and the dose from a continuous release assessment (which uses annual limits that are 12 times the ML) is less than 0.1 mSv in a year then a short-term release assessment is not required. Individual doses to adults, children and infants for scenarios 2 and 3 are presented in Tables A22 to A39.

Unit discharges of ^{11}C, ^{15}O and ^{18}F

4.12 For those radionuclides that might be released from a cyclotron, namely ^{11}C, ^{15}O and ^{18}F, the dose per unit short-term release values were estimated using different assumptions from those adopted for other radionuclides. Only exposure to gamma radiation from the plume and inhalation of the plume were considered and the dispersion does not include dry or wet deposition. Also, because releases from cyclotrons are likely to occur over periods of a few minutes it was assumed that the realistic short-term release has a duration of 30 minutes rather than 12 hours and no account was taken of any enhanced wind meander. Consequently, differences in the predictions from the realistic and cautious (neutral met conditions) scenarios are due almost entirely to the assumptions made about the length of time individuals spend outdoors. The dose ratio for the cautious (stable met conditions) scenario is significantly greater primarily due to the reduced dispersion and hence increased activity concentration in air and gamma irradiation from the plume. There is little difference between ratios at 100 m and 500 m. Results for scenario 1a are shown in Figures 3 to 5.

5 CASE STUDIES

5.1 Short-term release dose assessments were undertaken for two case studies. The aim was to compare doses calculated using the short-term methodology with those using the standard continuous release methodology for actual authorised discharge limits. The discharge limits are presented in Table 2.

- ***Case Study 1*** – An Advanced Gas-cooled Reactor (AGR) using a combination of QNL and WAL, and a 12 hour release.
- ***Case Study 2*** – Cyclotron using DL and a 30 minute release.

5.2 ***Case Study 1 – An Advanced Gas-cooled Reactor***

5.2.1 Discharges at QNLs and WALs from an AGR were used in this case study (Table 2). Where a WAL was used, i.e., for ^{35}S, two short-term releases of this radionuclide at this discharge level were considered in the assessment, but only the contributions to dose from inhalation and external exposure were included for the second release. Where food is harvested and stored for consumption throughout the year it is not realistic to assume the harvest will be affected by more than one short-term release. However, for some foods such as milk, production could be affected by multiple releases. This is discussed further below.

5.2.2 Cautious and realistic short-term release doses were calculated to members of the public using the same source term i.e. for radionuclides discharged at the specified short-term levels (see Figures 12 to 14 and Tables 3 to 5). In all cases, a release duration of 12 hours was assumed as a 30 minute duration was not considered reasonable for this scenario. The figures also show the contribution to dose of the remaining discharge that would be made over the rest of the year following the short-term event, although this contribution is not included in Tables 3 to 5. These remainder doses were calculated by scaling results for the continuous release, such as those in Table 6 for adults, by the difference between the annual discharge limit and the short-term levels. The exposure pathways considered are those shown in Table A10 where it can be seen that consumption of milk products is not considered appropriate for the realistic scenario.

5.2.3 The ratio of the doses between the short-term assessments and the continuous assessment is within a factor of 3 for adults and 7 for children and infants. These results are closer than those derived for the generic scenarios because of the lower discharge rates at the short-term levels and the fact that a 12 hour release duration was used for all short-term scenarios. The short-term levels are between about one fifth and one tenth of the annual discharge limit. It is worth noting that, compared to the realistic meteorological conditions, the cautious neutral conditions give rise to lower air concentrations for depositing radionuclides because of the enhanced wet deposition and plume depletion. The consequences of this are only obvious for the cloud beta doses because for inhalation and cloud gamma changes to other factors, namely inhalation rate and indoor occupancy, mask this reduction. If consumption of milk is included in the realistic assessment of the second short-term release of ^{35}S then the increase in dose to the short-term release would be 3% to adults, 6% to children and 15% to infants. For both cautious short-term assessments, which include consumption of milk and milk products, the corresponding increase in dose to adults, children and infants is about 6%, 10% and 20%, respectively.

5.2.4 From Figures 12 to 14 it can be seen that the total annual doses for short-term releases (including remaining discharges in the year) range from about 23 μSv to 133 μSv. The total annual doses for a continuous release assessment range from about 19 μSv to 84 μSv. The dose to infants is dominated by ^{14}C in milk products. It is important to note that a degree of caution was included in this case study because it was assumed that all the radionuclides are released together. In practice this is unlikely to be the case and more realistic source terms to be considered might include ^{3}H and ^{14}C during depressurisation, or ^{35}S and ^{41}Ar after depressurisation when a reactor is being brought back up to full power, or ^{60}Co if a filter fails or ^{131}I if a fuel element fails.

5.3 *Case Study 2 – A Cyclotron*

5.3.1 Discharges at the DL for a cyclotron were used in this case study. The discharge limits are provided in Table 2. It was assumed that 3 short-term releases at the DL may occur in a year i.e. the total short-term release for each radionuclide is 3 10^{11} Bq. It is cautiously assumed that the dose to the individuals being considered also includes a contribution from the residual discharge. This is calculated as the difference between the annual limit and 3 times the DL and is modelled as a continuous release.

5.3.2 Cautious and realistic short-term release doses were calculated to members of the public using the same source term (Figures 15 to 17 and Tables 7 to 9). The DL applies to the sum of the discharges of all positron-emitting radionuclides but in these calculations it was applied to each radionuclide separately. For this reason, results are presented for each radionuclide independently. The results in Tables 7 to 10 can be scaled by actual releases if the conditions modelled are representative of the actual release scenario. In all cases a release duration of 30 minutes was assumed because, based on operator experience, a 12 hour duration is considered unreasonable for this scenario. The contribution to dose of the remaining discharge that may be made over the rest of the year following the short-term event is small in comparison and not included in Tables 7 to 9. These remainder doses were calculated by scaling results for the continuous release, such as those in Table 10 for adults, by the difference between the annual discharge limit and 3 times the DL.

5.3.3 Variations in dose between age groups and release scenarios (i.e., short-term realistic, short-term cautious and continuous) were due in a large part to differences in the external dose from the plume which is governed by the amount of time spent indoors. It was assumed that individuals were permanently outdoors in the cautious assessment and therefore these results vary very little across the age groups considered.

5.3.4 It should be noted that for this case study the annual doses estimated using the assumptions for a continuous release assessment are less than 0.02 mSv and therefore short-term assessments would not be required [Ref 6]. However, short-term assessments were carried out here for illustrative purposes to show the relationship between dose calculated using the short-term release methodology and the continuous release methodology.

5.3.5 From Figures 15 to 17 it can be seen that the total annual doses for 3 short-term releases (including remaining discharges in the year) each at the daily limit of 1 10^{11} Bq range from about 0.5 μSv to 19 μSv depending on the radionuclide and assessment assumptions considered. The total annual doses for a continuous release assessment range from about 0.5 μSv to 2.0 μSv.

6 CONCLUSIONS

6.1 This report provides example assessments of short term releases to atmosphere using guidance produced by the NDAWG short-term release sub-group, to inform the process of proposing or setting short-term limits or notification levels. The NDAWG short term release guidance includes key parameter assumptions for cautious and realistic assessments of short-term releases to atmosphere.

6.2 Dose per unit short-term release data were calculated for commonly released radionuclides using the recommended cautious and realistic assumptions. These results can be used to estimate generic short-term doses by scaling to the actual discharge rates. Alternatively, where more site-specific information is available, the methods described can be used to determine doses for specific cases as was done for the two case studies considered in this report. The dose per unit release results and case studies have shown that where there are limits in place, that are typically an order of magnitude less than the authorised annual discharge limits (eg, monthly limits), estimates of dose for a realistic short-term release assessment may only be a factor of 3 higher than the doses from a continuous release assessment. Where there are only 12-month limits in place, doses for a realistic short-term release assessment may be a factor of 20 higher than the continuous release assessment.

6.3 Quantitative estimates of doses to embryo and fetus were not considered but guidance [Ref 12] on the calculation of doses to these groups indicates that only for ^{33}P are doses likely to exceed those of any other age group, for an atmospheric routine release, and then by a factor of up to four.

7 RECOMMENDATIONS

7.1 The first version of this report (NDAWG/1/2010) provided input to the guidance note for assessing doses to members of the public from reasonably foreseen or planned operational short-term releases of radioactive substances to air. This updated report does not require a significant change to the guidance although it has been reissued to include some typographical corrections. In addition, the following recommendations are made:

- The dose per unit short-term release values presented in this report may be used to scope the radiological impact of such events.
- Where there is a need to carry out site-specific assessments the tools to achieve this are not readily available. The development of such tools should be considered.

8 ACKNOWLEDGEMENTS

8.1 The authors are indebted to the valuable comments provided by members of the NDAWG steering group and in particular to Dr Peter Marsden, Dr Tim Parker and Dr Mike Thorne.

9 REFERENCES

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10 TABLES

Table 1 Generic release source terms for scenarios 1 to 3

Scenario	Short-term release			Continuous annual release for comparison with short-term scenario (TBq)
	Short-term release (TBq)	Continuous release for remainder of year (TBq)	Total release (TBq)	
Scenario 1 - 12 month limits only	1	0	1	1
Scenario 2 - Quarterly notification levels	0.25	0.75	1	1
Scenario 3 - Monthly limits	0.083	0.917	1	1

Table 2 Discharges used for case studies

Case study 1 – An Advanced Gas-cooled Reactor			
Radionuclide	Continuous Annual Limit (Bq)	Short-term Quarterly Notification Level (Bq)	Historical monthly peaks (1991 - 2007) (Bq)
^{3}H	$1.2\ 10^{13}$	$1.2\ 10^{12}$	$1.8\ 10^{12}$
^{14}C	$3.7\ 10^{12}$	$6.0\ 10^{11}$	$9.3\ 10^{11}$
^{35}S	$3.5\ 10^{11}$	$2.5\ 10^{10}$ [a]	$5.7\ 10^{10}$
^{41}Ar	$1.0\ 10^{14}$	$2.0\ 10^{13}$	$2.4\ 10^{13}$
^{60}Co	$1.0\ 10^{8}$	$1.5\ 10^{7}$	$6.9\ 10^{5}$
^{131}I	$1.5\ 10^{9}$	$6.0\ 10^{7}$	$6.0\ 10^{7}$

Case study 2 – A Cyclotron		
Radionuclide	Continuous Annual Limit – to include all discharges (Bq)	Short-term Daily limit – to include all discharges (Bq)
^{11}C		
^{15}O	$4.0\ 10^{12}$	$1.0\ 10^{11}$ [b]
^{18}F		

[a] Two discharges of ^{35}S are assumed to occur at this weekly advisory level

[b] Three discharges of these positron emitters at this daily limit are considered in the short-term assessment (see Section 5.3.1)

Table 3 Case Study 1 – Adult annual doses (Sv) at 1200 m from an AGR for realistic short-term release assessment using short–term limits from Table 2

	Annual dose (Sv)					
Radionuclide	Food	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Total
^{3}H	$2.0\ 10^{-7}$	-	-	-	$1.5\ 10^{-8}$	$2.2\ 10^{-7}$
^{14}C	$3.7\ 10^{-6}$	$9.2\ 10^{-10}$	-	-	$5.8\ 10^{-7}$	$4.3\ 10^{-6}$
^{35}S	$3.7\ 10^{-7}$	$2.6\ 10^{-10}$	-	-	$4.9\ 10^{-8}$	$4.2\ 10^{-7}$
^{41}Ar	-	-	$8.5\ 10^{-7}$	-	-	$8.5\ 10^{-7}$
^{60}Co	$4.0\ 10^{-10}$	$1.4\ 10^{-13}$	$1.3\ 10^{-12}$	$2.3\ 10^{-9}$	$1.1\ 10^{-10}$	$2.8\ 10^{-9}$
^{131}I	$1.6\ 10^{-8}$	$1.3\ 10^{-12}$	$7.9\ 10^{-13}$	$1.9\ 10^{-10}$	$2.9\ 10^{-10}$	$1.7\ 10^{-8}$
Total	$4.3\ 10^{-6}$	$1.2\ 10^{-9}$	$8.5\ 10^{-7}$	$2.5\ 10^{-9}$	$6.5\ 10^{-7}$	$5.8\ 10^{-6}$

Table 4 Case Study 1 – Adult annual doses (Sv) at 1200 m from an AGR for cautious (neutral conditions) short-term release assessment using short–term limits from Table 2

	Annual dose (Sv)					
Radionuclide	Food	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Total
^{3}H	$1.5\ 10^{-6}$	-	-	-	$2.1\ 10^{-8}$	$1.5\ 10^{-6}$
^{14}C	$6.0\ 10^{-6}$	$9.2\ 10^{-10}$	-	-	$8.2\ 10^{-7}$	$6.8\ 10^{-6}$
^{35}S	$7.8\ 10^{-7}$	$2.5\ 10^{-10}$	-	-	$6.8\ 10^{-8}$	$8.5\ 10^{-7}$
^{41}Ar	-	-	$1.4\ 10^{-6}$	-	-	$1.4\ 10^{-6}$
^{60}Co	$5.2\ 10^{-9}$	$1.4\ 10^{-13}$	$2.1\ 10^{-12}$	$7.1\ 10^{-9}$	$1.5\ 10^{-10}$	$1.2\ 10^{-8}$
^{131}I	$6.3\ 10^{-8}$	$1.3\ 10^{-12}$	$1.3\ 10^{-12}$	$3.0\ 10^{-10}$	$4.0\ 10^{-10}$	$6.4\ 10^{-8}$
Total	$8.3\ 10^{-6}$	$1.2\ 10^{-9}$	$1.4\ 10^{-6}$	$7.4\ 10^{-9}$	$9.2\ 10^{-7}$	$1.1\ 10^{-5}$

Table 5 Case Study 1 – Adult annual doses (Sv) at 1200 m from an AGR for cautious (stable conditions) short-term release assessment using short–term limits from Table 2

	Annual dose (Sv)					
Radionuclide	**Food**	**Cloud beta**	**Cloud gamma**	**Deposited gamma**	**Inhalation**	**Total**
^{3}H	$1.3\ 10^{-6}$	-	-	-	$4.87\ 10^{-8}$	$1.32\ 10^{-6}$
^{14}C	$1.7\ 10^{-5}$	$2.6\ 10^{-9}$	-	-	$2.3\ 10^{-6}$	$1.9\ 10^{-5}$
^{35}S	$1.9\ 10^{-6}$	$6.1\ 10^{-10}$	-	-	$1.7\ 10^{-7}$	$2.1\ 10^{-6}$
^{41}Ar	-	-	$2.7\ 10^{-6}$	-	-	$2.7\ 10^{-6}$
^{60}Co	$1.6\ 10^{-9}$	$3.9\ 10^{-13}$	$4.0\ 10^{-12}$	$2.2\ 10^{-9}$	$4.2\ 10^{-10}$	$4.2\ 10^{-9}$
^{131}I	$6.8\ 10^{-8}$	$2.5\ 10^{-12}$	$2.4\ 10^{-12}$	$3.2\ 10^{-10}$	$8.1\ 10^{-10}$	$6.9\ 10^{-8}$
Total	$2.0\ 10^{-5}$	$3.2\ 10^{-9}$	$2.7\ 10^{-6}$	$2.5\ 10^{-9}$	$2.6\ 10^{-6}$	$2.6\ 10^{-5}$

Table 6 Case Study 1 – Adult annual doses (Sv) at 1200 m from an AGR for continuous release assessment using annual limits from Table 2

	Annual dose (Sv)					
Radionuclide	**Food**	**Cloud beta**	**Cloud gamma**	**Deposited gamma**	**Inhalation**	**Total**
^{3}H	$9.4\ 10^{-8}$	-	-	-	$3.9\ 10^{-8}$	$1.3\ 10^{-7}$
^{14}C	$5.4\ 10^{-6}$	$1.0\ 10^{-11}$	-	-	$4.9\ 10^{-7}$	$5.9\ 10^{-6}$
^{35}S	$1.2\ 10^{-5}$	$3.0\ 10^{-12}$	-	-	$4.5\ 10^{-8}$	$1.2\ 10^{-5}$
^{41}Ar	-	$9.3\ 10^{-9}$	$6.0\ 10^{-7}$	-	-	$6.1\ 10^{-7}$
^{60}Co	$3.3\ 10^{-10}$	$1.7\ 10^{-15}$	$1.2\ 10^{-12}$	$7.1\ 10^{-10}$	$9.8\ 10^{-11}$	$1.1\ 10^{-9}$
^{131}I	$1.5\ 10^{-7}$	$5.3\ 10^{-14}$	$2.9\ 10^{-12}$	$6.7\ 10^{-10}$	$9.2\ 10^{-10}$	$1.5\ 10^{-7}$
Total	$1.8\ 10^{-5}$	$9.3\ 10^{-9}$	$6.0\ 10^{-7}$	$1.4\ 10^{-9}$	$5.8\ 10^{-7}$	$1.9\ 10^{-5}$

Table 7 Case Study 2 – Annual doses (Sv) from a cyclotron for realistic short-term release assessment using 3 x short–term limits from Table 2 and excluding any contribution from continuous discharges

	External dose (Sv)						Inhalation dose (Sv)					
	100 m			500 m			100 m			500 m		
Radionuclide	Adult	Child	Infant	Adult	Child	Infant	Adult	Child	Infant	Adult	Child	Infant
^{11}C	$1.7\ 10^{-6}$	$9.9\ 10^{-7}$	$7.7\ 10^{-7}$	$1.1\ 10^{-7}$	$6.5\ 10^{-8}$	$5.1\ 10^{-8}$	$2.0\ 10^{-7}$	$2.8\ 10^{-7}$	$3.3\ 10^{-7}$	$1.3\ 10^{-8}$	$1.8\ 10^{-8}$	$2.2\ 10^{-8}$
^{15}O	$1.4\ 10^{-6}$	$8.4\ 10^{-7}$	$6.5\ 10^{-7}$	$4.6\ 10^{-8}$	$2.8\ 10^{-8}$	$2.2\ 10^{-8}$	$7.3\ 10^{-9}$	-	-	$2.4\ 10^{-10}$	-	-
^{18}F	$1.7\ 10^{-6}$	$1.0\ 10^{-6}$	$7.8\ 10^{-7}$	$1.2\ 10^{-7}$	$7.0\ 10^{-8}$	$5.5\ 10^{-8}$	$5.2\ 10^{-7}$	$7.6\ 10^{-7}$	$9.2\ 10^{-7}$	$3.6\ 10^{-8}$	$5.3\ 10^{-8}$	$6.4\ 10^{-8}$

Table 8 Case Study 2 – Annual doses (Sv) from a cyclotron for cautious (neutral conditions) short-term release assessment using 3 x short–term limits from Table 2 and excluding any contribution from continuous discharges

	External dose (Sv)						Inhalation dose (Sv)					
	100 m			500 m			100 m			500 m		
Radionuclide	Adult	Child	Infant	Adult	Child	Infant	Adult	Child	Infant	Adult	Child	Infant
^{11}C	$2.8\ 10^{-6}$	$2.8\ 10^{-6}$	$2.8\ 10^{-6}$	$1.8\ 10^{-7}$	$1.8\ 10^{-7}$	$1.8\ 10^{-7}$	$2.8\ 10^{-7}$	$2.8\ 10^{-7}$	$3.3\ 10^{-7}$	$1.9\ 10^{-8}$	$1.8\ 10^{-8}$	$2.2\ 10^{-8}$
^{15}O	$2.3\ 10^{-6}$	$2.3\ 10^{-6}$	$2.3\ 10^{-6}$	$7.7\ 10^{-8}$	$7.7\ 10^{-8}$	$7.7\ 10^{-8}$	$1.0\ 10^{-8}$	-	-	$3.4\ 10^{-10}$	-	-
^{18}F	$2.8\ 10^{-6}$	$2.8\ 10^{-6}$	$2.8\ 10^{-6}$	$2.0\ 10^{-7}$	$2.0\ 10^{-7}$	$2.0\ 10^{-7}$	$7.4\ 10^{-7}$	$7.6\ 10^{-7}$	$9.2\ 10^{-7}$	$5.1\ 10^{-8}$	$5.3\ 10^{-8}$	$6.4\ 10^{-8}$

Table 9 Case Study 2 – Annual doses (Sv) from a cyclotron for cautious (stable conditions) short-term release assessment using 3 x short–term limits from Table 2 and excluding any contribution from continuous discharges

	External dose (Sv)						Inhalation dose (Sv)					
	100 m			500 m			100 m			500 m		
	Adult	Child	Infant	Adult	Child	Infant	Adult	Child	Infant	Adult	Child	Infant
^{11}C	1.4 10^{-5}	1.4 10^{-5}	1.4 10^{-5}	1.1 10^{-6}	1.1 10^{-6}	1.1 10^{-6}	1.4 10^{-6}	1.4 10^{-6}	1.7 10^{-6}	1.1 10^{-7}	1.1 10^{-7}	1.3 10^{-7}
^{15}O	1.1 10^{-5}	1.1 10^{-5}	1.1 10^{-5}	3.1 10^{-7}	3.1 10^{-7}	3.1 10^{-7}	4.7 10^{-8}	-	-	1.4 10^{-9}	-	-
^{18}F	1.4 10^{-5}	1.4 10^{-5}	1.4 10^{-5}	1.2 10^{-6}	1.2 10^{-6}	1.2 10^{-6}	3.7 10^{-6}	3.8 10^{-6}	4.6 10^{-6}	3.3 10^{-7}	3.4 10^{-7}	4.1 10^{-7}

Table 10 Case Study 2 – Annual doses (Sv) from a cyclotron for continuous assessment using annual limits from Table 2

	External dose (Sv)						Inhalation dose (Sv)					
	100 m			500 m			100 m			500 m		
	Adult	Child	Infant	Adult	Child	Infant	Adult	Child	Infant	Adult	Child	Infant
^{11}C	1.5 10^{-6}	9.1 10^{-7}	7.1 10^{-7}	1.1 10^{-7}	6.6 10^{-8}	5.1 10^{-8}	1.4 10^{-7}	1.9 10^{-7}	2.2 10^{-7}	1.0 10^{-8}	1.4 10^{-8}	1.6 10^{-8}
^{15}O	1.3 10^{-6}	7.8 10^{-7}	6.1 10^{-7}	5.1 10^{-8}	3.0 10^{-8}	2.4 10^{-8}	5.2 10^{-9}	-	-	2.0 10^{-10}	-	-
^{18}F	1.5 10^{-6}	9.3 10^{-7}	7.2 10^{-7}	1.2 10^{-7}	7.1 10^{-8}	5.5 10^{-8}	3.7 10^{-7}	5.1 10^{-7}	6.0 10^{-7}	2.8 10^{-8}	3.9 10^{-8}	4.6 10^{-8}

11 FIGURES

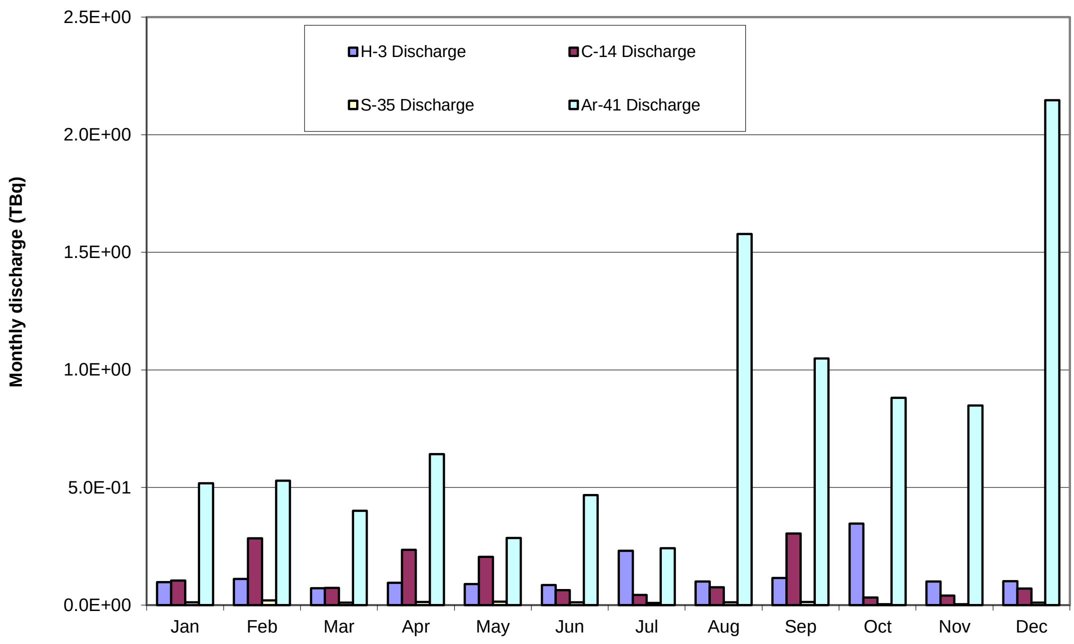

Figure 1 Discharge profile for 2008 from an AGR. (Discharges of ^{131}I and ^{60}Co were also reported over this period at levels between 5 10^{-7} and 8.5 10^{-7} TBq per month.)

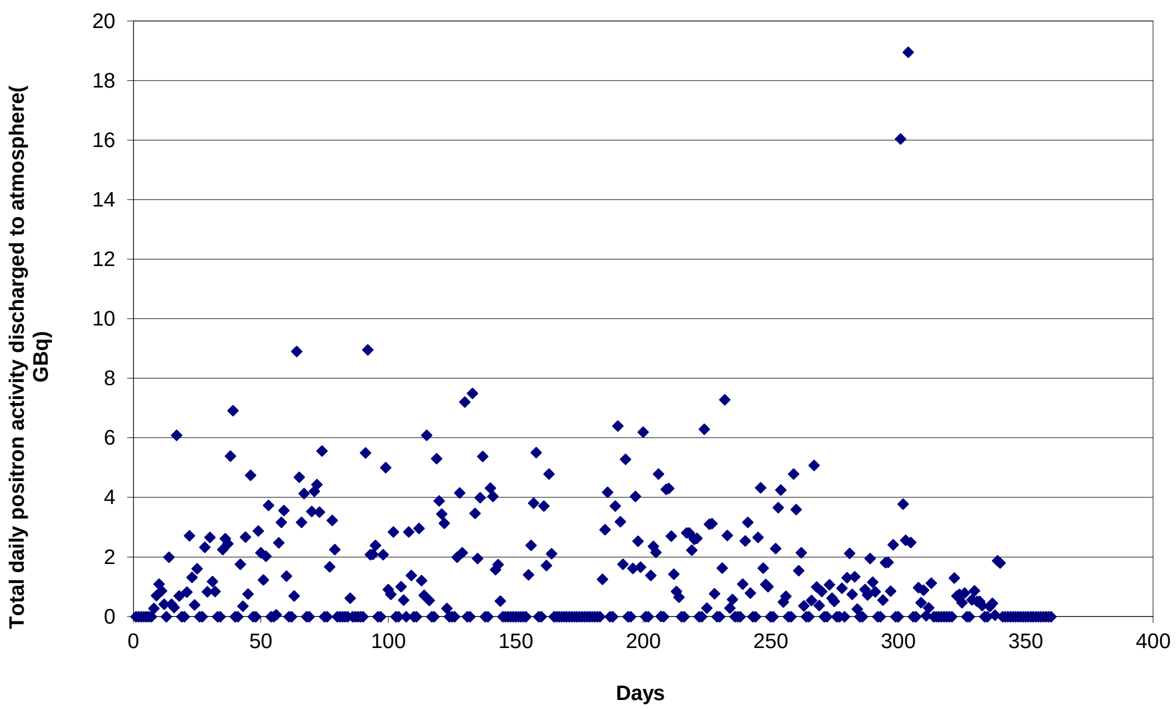

Figure 2 Discharge profile from the Hammersmith Imanet cyclotron. (Outliers exceeding 16 GBq were due to problems occurring with synthesis rigs where a waste trap did not capture all of the waste gases)

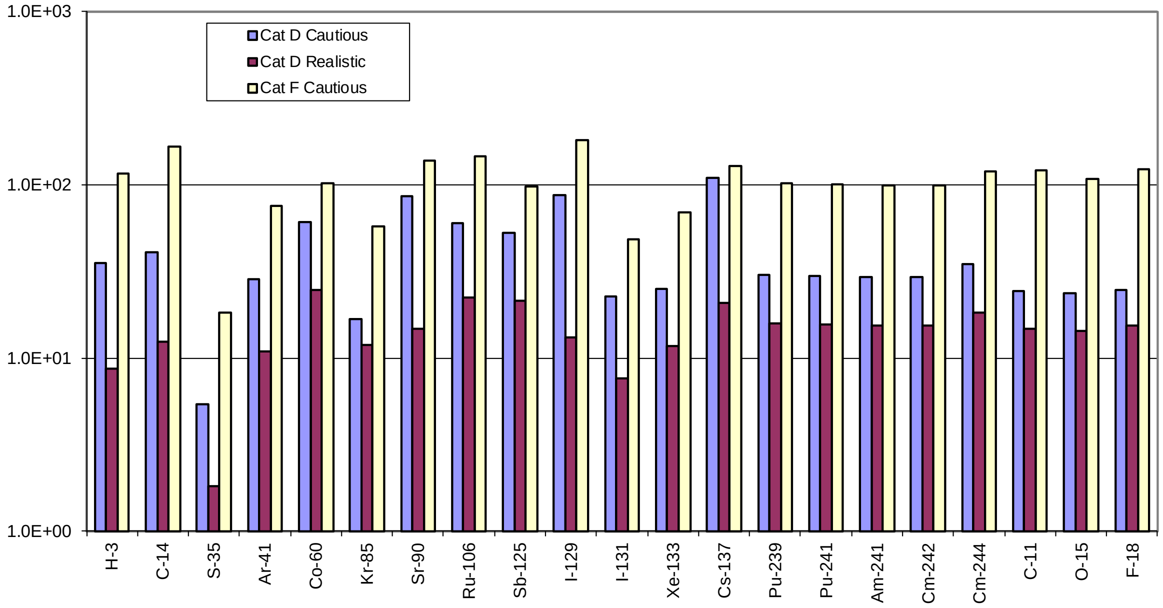

Figure 3 Ratios of adult dose from short-term release scenarios 1a to 1c to continuous release

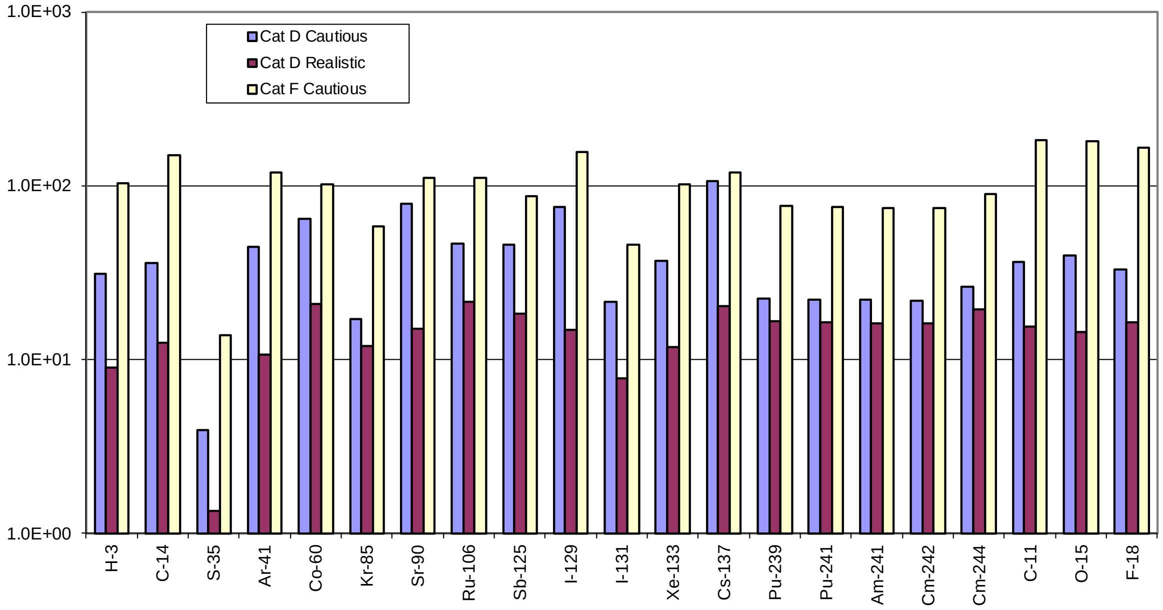

Figure 4 Ratios of child dose from short-term release scenarios 1a to 1c to continuous release

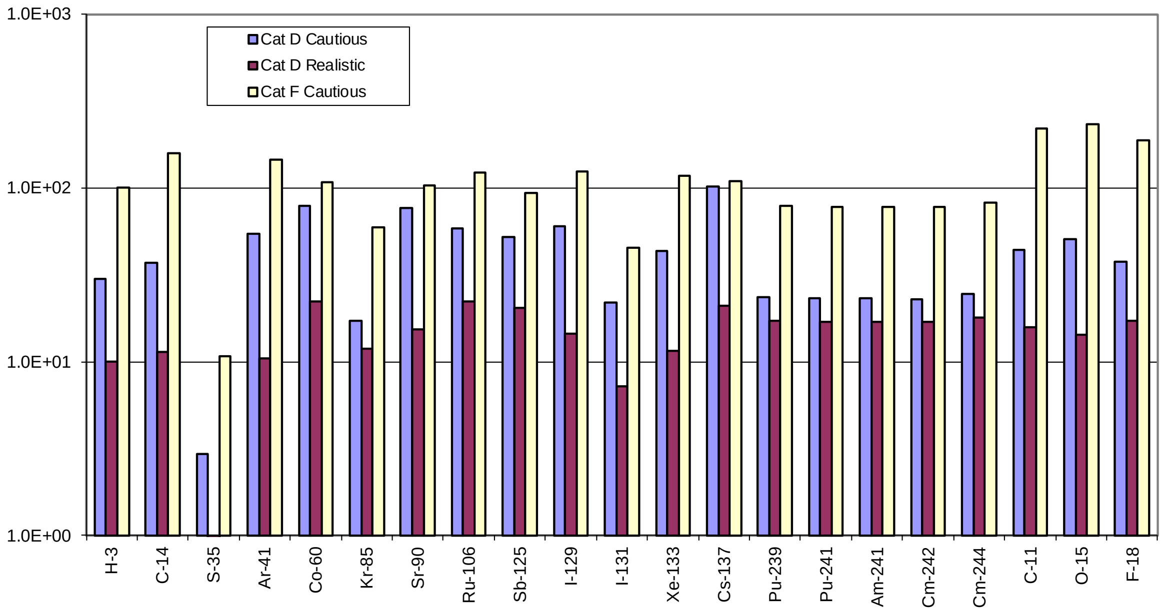

Figure 5 Ratios of infant dose from short-term release scenarios 1a to 1c to continuous release

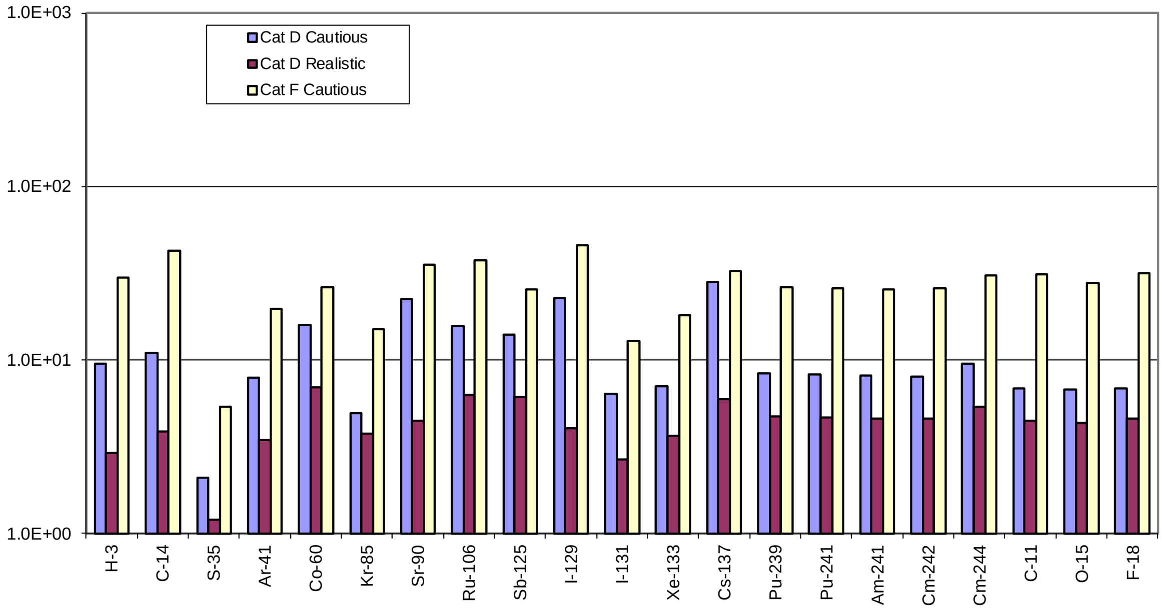

Figure 6 Ratios of adult dose from short-term release scenarios 2a to 2c to continuous release

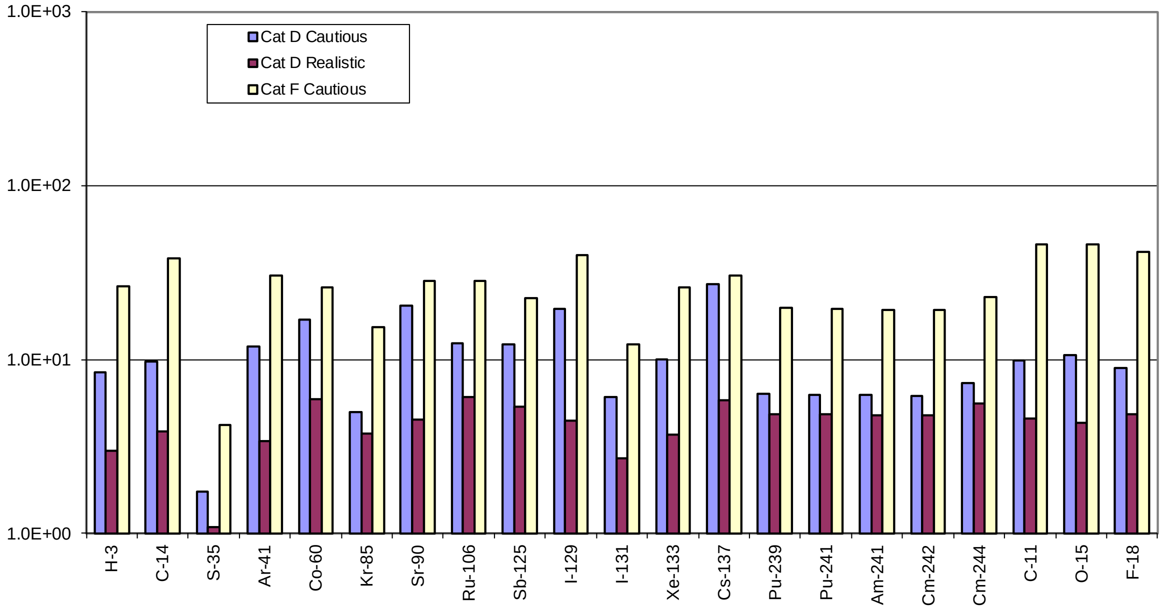

Figure 7 Ratios of child dose from short-term release scenarios 2a to 2c to continuous release

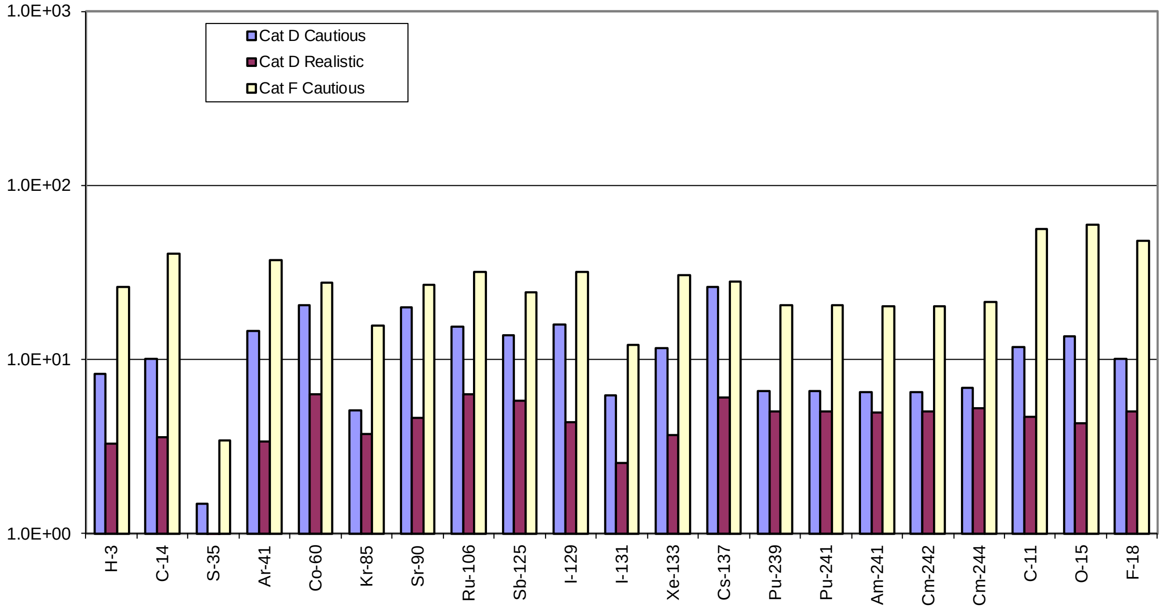

Figure 8 Ratios of infant dose from short-term release scenarios 2a to 2c to continuous release

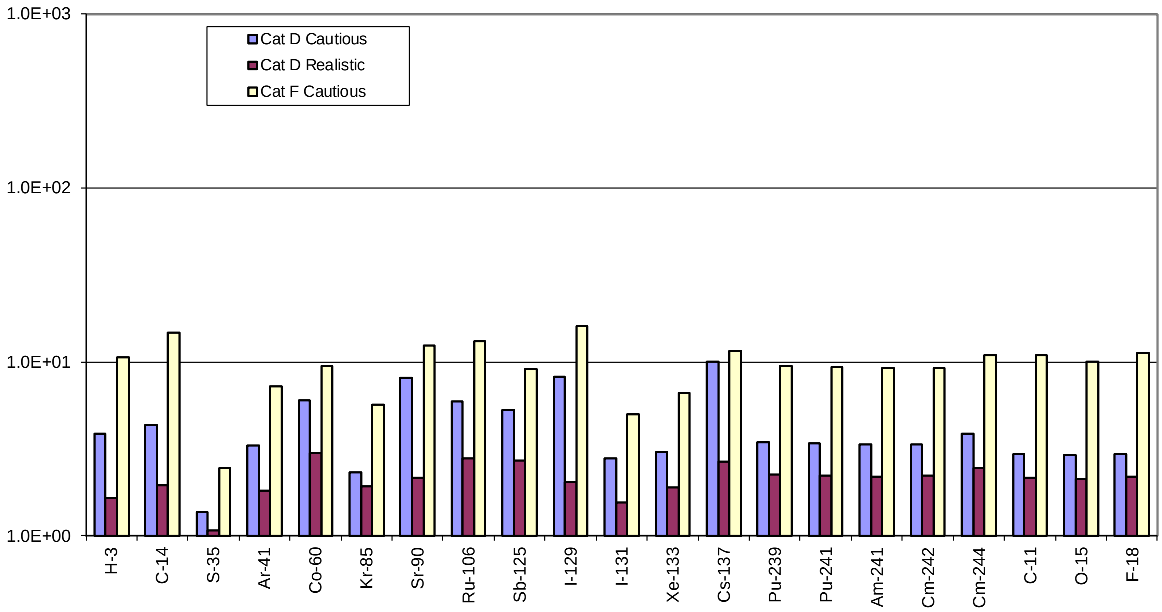

Figure 9 Ratios of adult dose from short-term release scenarios 3a to 3c to continuous release

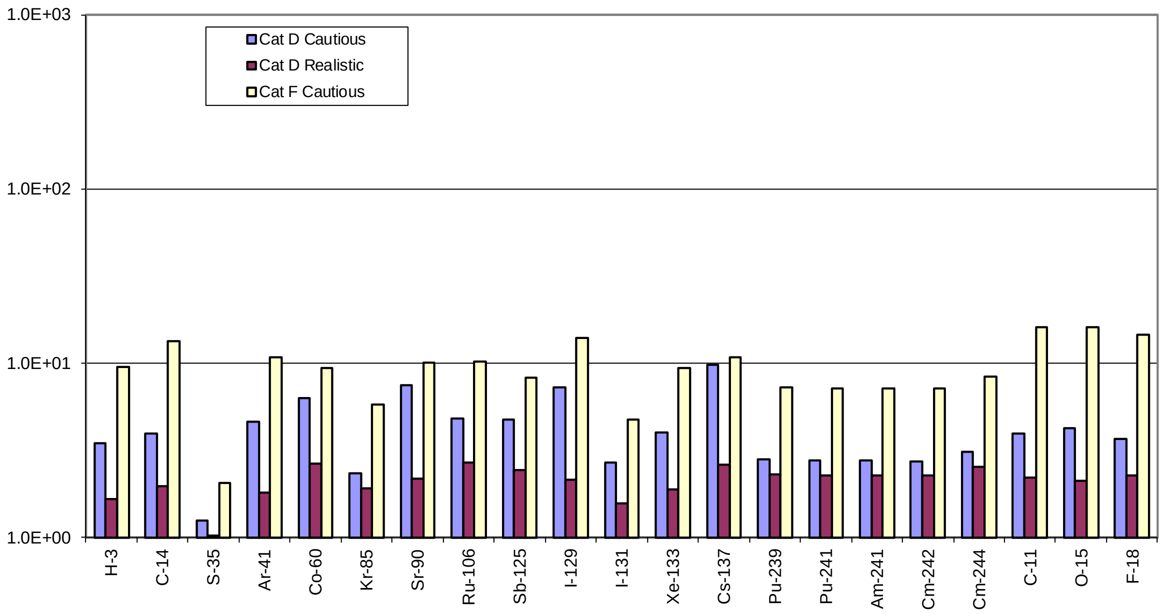

Figure 10 Ratios of child dose from short-term release scenarios 3a to 3c to continuous release

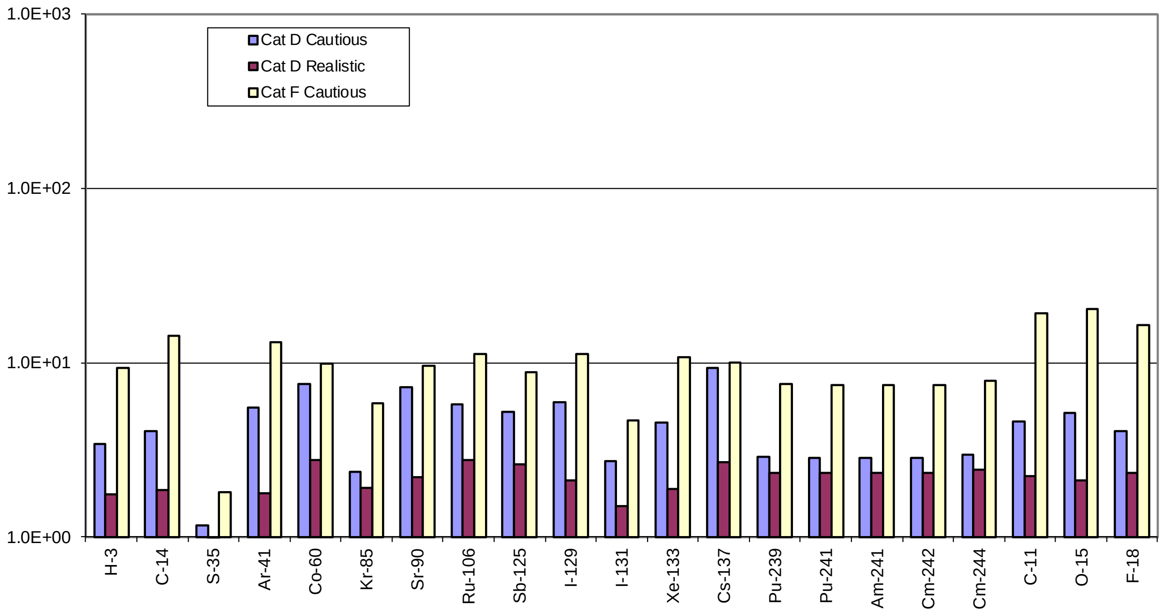

Figure 11 Ratios of infant dose from short-term release scenarios 3a to 3c to continuous release

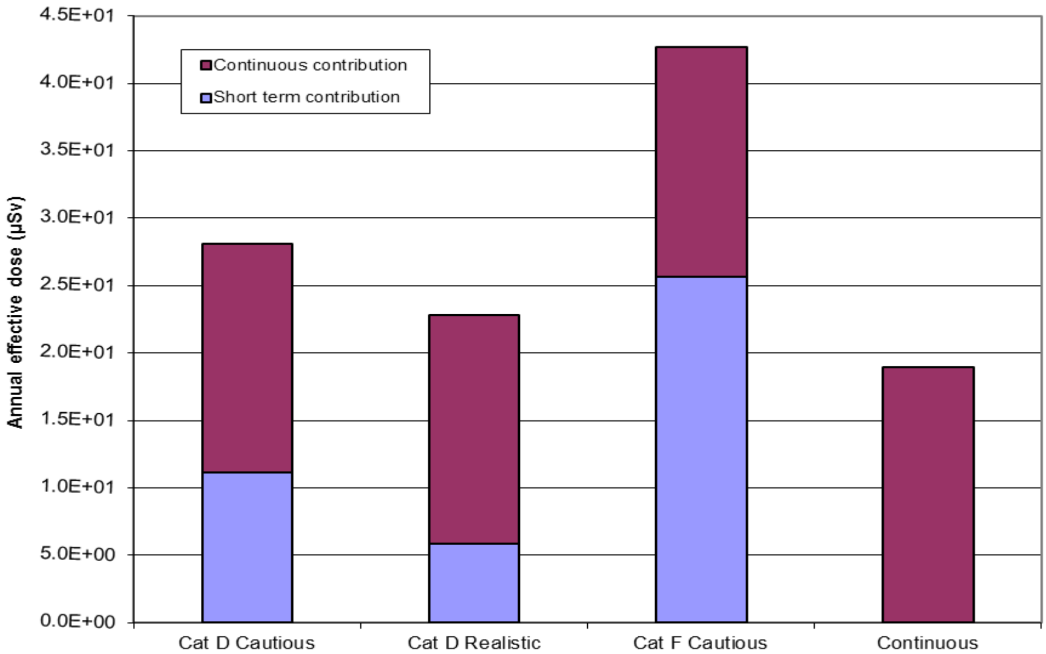

Figure 12 Case study 1 – Adult annual doses (µSv) at 1200 m from an AGR

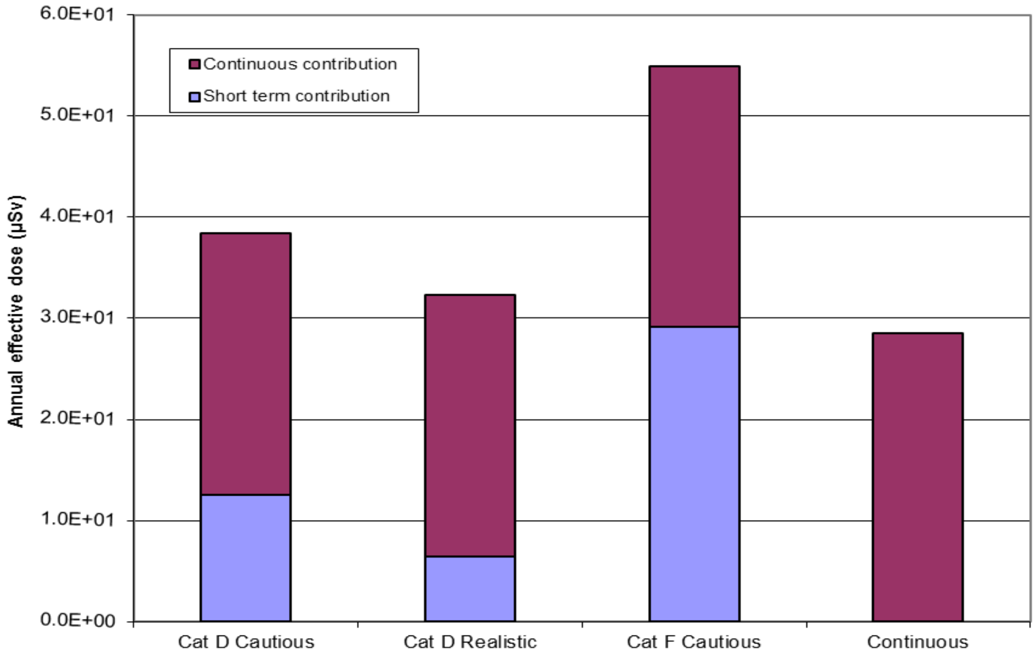

Figure 13 Case study 1 - Child annual doses (µSv) 1200 m from an AGR

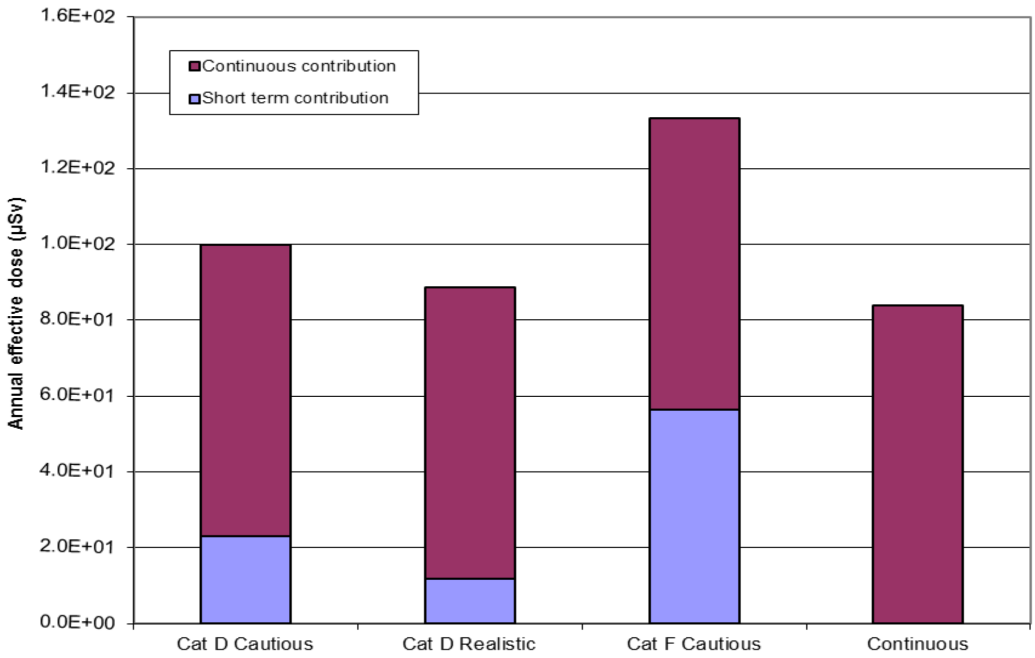

Figure 14 Case study 1 - Infant annual doses (µSv) 1200 m from an AGR

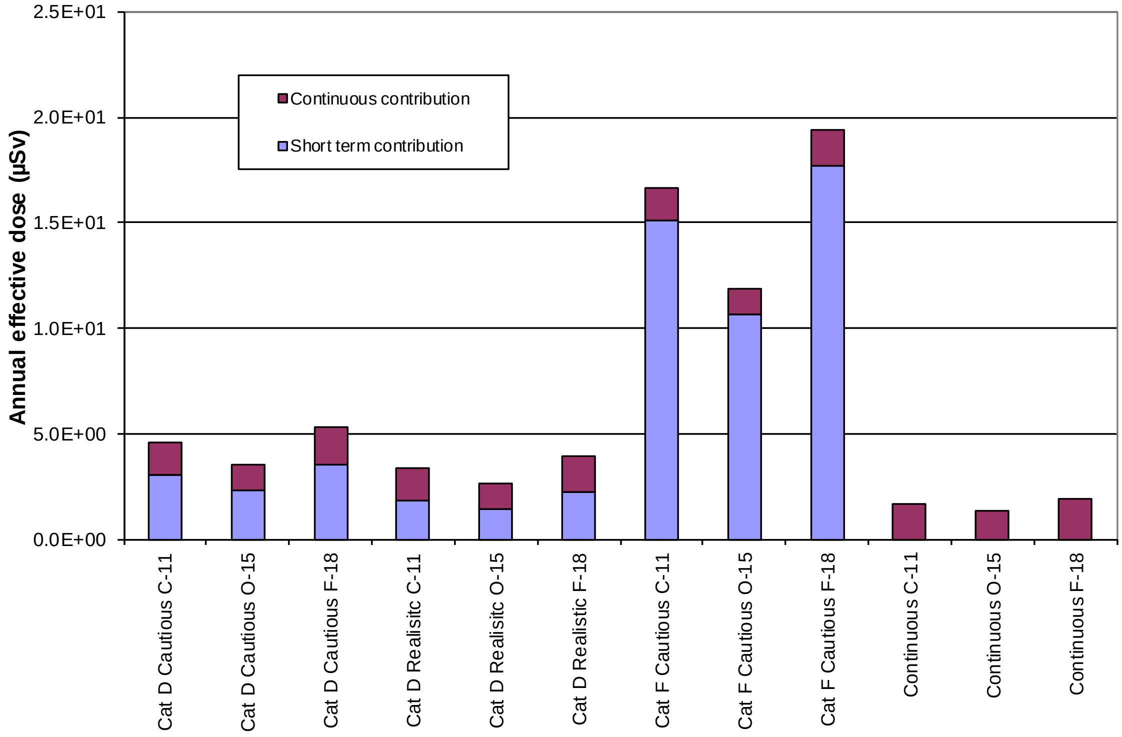

Figure 15 Case study 2 – Adult annual doses (µSv) at 100 m from cyclotron

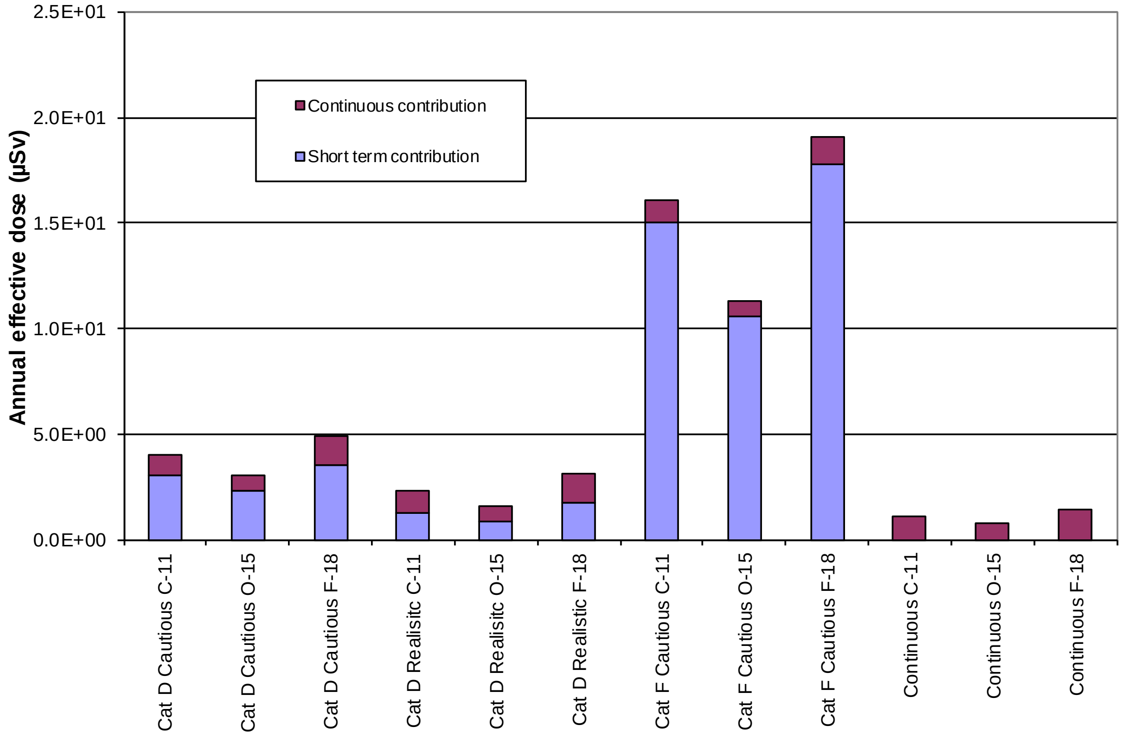

Figure 16 Case study 2 - Child annual doses (µSv) at 100 m from cyclotron

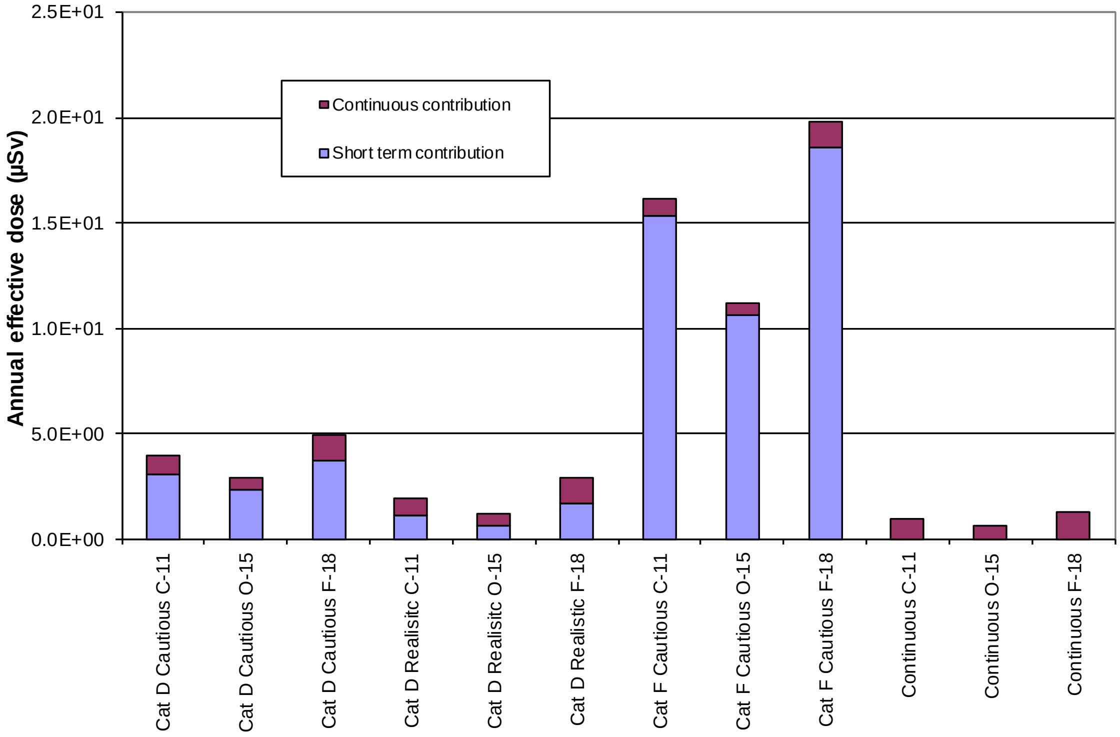

Figure 17 Case study 2 - Infant annual doses (µSv) at 100 m from cyclotron

APPENDIX A METHODOLOGIES AND DATA USED TO ASSESS DOSES PER UNIT RELEASE

A1 Introduction

This appendix describes in more detail the methodologies used in this report. It includes the general methodologies used for short-term and continuous releases that were applied to discharges from an AGR and the modified methodologies that were applied to the special case of a cyclotron.

A2 Methodology for short-term releases – general approach

The methodology used to calculate doses from short-term releases follows that described in report NRPB-W54 [Ref A1]. The atmospheric dispersion model ADMS 4 [Ref A2] was used to estimate air concentrations, deposition rates and cloud gamma dose rates for each release for selected radionuclides. The meteorological data, source and dispersion parameters used in ADMS 4 are given in Tables A1 and A2. ADMS is designed to model continuous releases but can be used to estimate air concentrations arising from short-term releases if an appropriate release rate is used. In addition, the fluctuation in wind direction during the release was taken into account using the approach adopted in report NRPB-W54 [Ref A1]. For realistic short-term releases, which are assumed to occur over a 12 hour period, it is estimated that on average the wind deviates over an angle of about 60 degrees.

ADMS results were combined in a spreadsheet with dose coefficients and habits data to calculate doses to members of the public. Only those exposure pathways of primary importance for the radionuclides being considered were included. The assumptions made and data used are given in the NDAWG short term release guidance [Ref 6] and the tables in this appendix.

Exposures arising from the deposition of radionuclides onto the ground include ingestion of contaminated terrestrial foods, external exposure to gamma radiation and inhalation of resuspended material. Ingestion doses were calculated using estimates of total deposition from ADMS combined with activity concentrations in food (Tables A3 and A4), delay times (Table A5), ingestion rates (Table A6) and ingestion dose coefficients (Table A7). Activity concentrations of ^{14}C and ^{35}S in foods were supplied by Food Standards Agency using the PRISM model [Ref A3], values for ^{3}H were taken from the PHE model TRIF [Ref A4] and values for other radionuclides were taken from the PHE model FARMLAND [Ref A5]. It is worth noting that equilibrium transfer factors for ^{35}S to the soft tissue of cattle and sheep are significantly lower in PRISM than in FARMLAND being $4\ 10^{-3}$ d kg^{-1}, $4\ 10^{-2}$ d kg^{-1} and $3\ 10^{-1}$ d kg^{-1}, 5 d kg^{-1}, respectively. The transfer factor to cow milk is also smaller in PRISM than in FARMLAND being $1.1\ 10^{-2}$ d l^{-1} and $2\ 10^{-2}$ d l^{-1}, respectively. It can also be seen that the values in Table A3 for ^{14}C and ^{35}S are greater than those in Table A4 because of the units used. The integrated activity concentration in food per unit air concentration is greater for a release that continues for 12 hours (the realistic case) than one that continues for just 30 minutes (the cautious case). However, in the cautious case the actual air concentration during the release is much higher. Doses from exposure to gamma rays from deposited radionuclides were calculated using estimates of total deposition from ADMS, occupancy data, shielding factors and dose coefficients [Ref A6]. Doses from inhalation of resuspended material were calculated using estimates of total deposition from ADMS, resuspended activity concentrations in air [Ref A7], occupancy data, inhalation rates and inhalation dose coefficients (Table A8).

Exposures arising directly from the radioactive plume include inhalation of the plume, external exposure to beta radiation and external exposure to gamma radiation. Inhalation doses were calculated using estimates of activity concentrations in air from ADMS combined with inhalation rates, occupancy data and inhalation dose coefficients (Table A8). Doses from external exposure to beta radiation from the plume were calculated using activity concentrations in air from ADMS, occupancy data and dose coefficients from [Ref A8]. Doses from external exposure to gamma radiation from the plume were calculated using ADMS.

The dose per unit short-term release values for scenario 1 for adults, children and infants are shown in Tables A10 to A12, A14 to A16 and A18 to A20, respectively. Similarly, dose per unit short-term release values for scenarios 2 and 3 are presented in Tables A22 to A39. These doses have been calculated using the assessment assumptions as defined in the NDAWG short term release guidance [Ref 6].

A3 Methodology for continuous releases – general approach

To calculate doses from continuous releases the model ADMS 4 was used. Output from ADMS 4 was used as input to the dose assessment software PC CREAM [Ref A8]. The assumptions made are given in the NDAWG short term release guidance [Ref 6]. PC CREAM requires information on activity concentrations in air, deposition rates and dose rates from gamma radiation by the plume as a function of distance from the release point and for specific stability categories. ADMS 4 was run using meteorological data representing different Pasquill-Gifford stability categories (Table A1) and the source and dispersion parameters detailed in Table A2. The ADMS 4 results were then compiled into a file with the format of a PLUME [Ref A8] output file and used in PC CREAM along with long-term statistical meteorological data (Table A1) to estimate annual average doses.

The dose per unit continuous release values for scenario 1 for adults, children and infants are shown in Tables A13, A17 and A21, respectively. These have been calculated using continuous release assessment assumptions as described in the NDAWG short term release guidance [Ref 6].

A4 Methodologies for releases from a cyclotron

The radionuclides released from a cyclotron that are of radiological significance are the positron emitters ^{11}C, ^{15}O and ^{18}F. These radionuclides are not available in the dispersion model ADMS 4 and therefore a fairly simple approach to the assessment method was developed. The principal exposure pathways are external exposure to gamma rays resulting from positron annihilation and inhalation of radionuclides in the plume. It is unnecessary to calculate doses from other pathways such as the ingestion of terrestrial foods.

ADMS 4 was used to estimate the activity concentration in air of a radionuclide for which radioactive decay over the timescales of interest was negligible, namely ^{129}I. This was done for a realistic and a cautious short-term releases. However, the release duration for the realistic scenario was assumed to be 30 minutes, rather than the default 12 hours, because emissions from cyclotrons typically occur over short periods of time. Consequently, deviation in wind direction was not accounted for i.e. the wind direction was assumed to be constant during the 30 minute release period. The activity concentrations in air for ^{11}C, ^{15}O and ^{18}F were then calculated taking into account the radioactive decay of these radionuclides. Dose rates for submersion in a semi-infinite cloud (Table A9) were taken from [Ref A9] which derived the data from [Ref A10]. These results are for effective dose equivalent but provide an adequate estimate of the effective dose. Doses from inhalation of radionuclides in the plume were estimated using the dose coefficients given in Table A9 and the inhalation rates from the NDAWG short term release guidance [Ref 6].

Doses arising from continuous releases were also calculated for comparison purposes. The method adopted is similar to that described for short-term releases except that long term statistical meteorological data were used to represent dispersion over an entire year (Table A1). These data account for the frequency with which different atmospheric conditions occur and can be used to estimate an annual average activity concentration in air from the ongoing release.

Short-term release doses arising from 3 short-term releases, each of 100 GBq, are given in Tables 7 to 9 of the main text and for a continuous release of 4 TBq y^{-1} in Table 10.

A5 References

A1 Smith J et al (2004). A Methodology for Assessing Doses from Short-Term Planned Discharges to Atmosphere. Chilton, NRPB-W54.

A2 CERC (2008). ADMS Version 4 Cambridge Environmental Research Consultants. http://www.cerc.co.uk/

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Table A1 Meteorological data

Stability	Rainfall rate (mm h^{-1})	Wind speed (m s^{-1})	Mixing layer height (m)
Data for annual average scenarios [a, b]			
Pasquill category A (1/MO length =-0.5)	0	1	1300
Pasquill category B (1/MO length =-0.1)	0	2	900
Pasquill category C (1/MO length =-0.01)	0	5	850
Pasquill category D (1/MO length =0)	0	5	800
Pasquill category E (1/MO length =0.01)	0	3	400
Pasquill category F (1/MO length =0.05)	0	2	100
Pasquill category C (1/MO length =-0.01)	1	5	850
Pasquill category D (1/MO length =0)	1	5	800
Data for short-term release scenarios (realistic neutral conditions) (used for scenario 1a)			
Pasquill category D (1/MO length = 0)	0.1	3	800
Data for short-term release scenarios (cautious neutral conditions) (used for scenario 1b)			
Pasquill category D (1/MO length = 0)	1	3	800
Data for short-term release scenarios (cautious stable conditions) (used for scenario 1c)			
Pasquill category F (1/MO length = 0.05)	0	2	100

[a] Uses a uniform wind rose and stability category frequency of 70% D (as defined in reference A10) or site-specific data from British Energy.
[b] MO is the Monin-Obukhov length (m).

Table A2 Source and dispersion parameter values used

Parameter	DPUR value	AGR	Cyclotron
Radionuclides	^{3}H, ^{14}C, ^{35}S, ^{41}Ar, ^{60}Co, ^{85}Kr, ^{90}Sr, ^{106}Ru, ^{129}I, ^{131}I, ^{133}Xe, ^{137}Cs, ^{239}Pu, ^{241}Am, ^{242}Cm, ^{244}Cm, ^{125}Sb, ^{241}Pu	^{3}H, ^{14}C, ^{35}S, ^{41}Ar, ^{60}Co, Beta particulate (^{90}Sr) and ^{131}I	^{129}I as surrogate for ^{11}C, ^{15}O and ^{18}F
Source type	Point	Point	Point
Source diameter	1 m	1 m	1 m
Effective stack height	0 m	21 m	0 m
Emission velocity	0 m s^{-1}	0 m s^{-1}	0 m s^{-1}
Radioactive decay	Yes	Yes	No (applied outside dispersion calculation)
Dry deposition included	1 10^{-3} m s^{-1} (exceptions: 1 10^{-2} for Iodine; 5 10^{-3} for ^{3}H and 4 10^{-3} for ^{35}S; 0 for noble gases, ^{11}C, ^{15}O and ^{18}F)	1 10^{-3} m s^{-1} (exceptions: 1 10^{-2} for Iodine; 5 10^{-3} for ^{3}H and 4 10^{-3} for ^{35}S; 0 for noble gases)	No
Wet deposition included	Dependent on rainfall rate in met file (not included for noble gases, ^{11}C, ^{15}O and ^{18}F)	Dependent on rainfall rate in met file (not included for noble gases)	No
Cloud gamma included	Yes	Yes	Yes
Release rate	1 TBq y^{-1} or 1 TBq/(release duration in seconds)	AL Bq y^{-1} or QNL/(release duration in seconds)	1 TBq y^{-1} or 1 TBq/(release duration in seconds)
Release duration	Continuous, 12 hour (realistic) and 30 minutes (cautious) (30 minutes as realistic for positron emitters)	Continuous and 12 hour (12 hour also used for cautious assessment)	Continuous and 30 minutes (30 minutes also used for cautious assessment)
Met data	Uniform wind rose and 70% D, realistic D, cautious D and F (See Table A1)	Uniform wind rose and site-specific met frequencies, realistic D, cautious D and F (See Table A1)	Uniform wind rose and 70% D, realistic D, cautious D and F (See Table A1)
Roughness length	0.3	0.3	1

Table A3 Activity concentrations in foods for realistic short-term assessment integrated to 1 year (Bq y kg^{-1} per Bq m^{-2} or Bq y kg^{-1} per Bq m^{-3})

	Green vegetables	Fruit	Root vegetables	Cow milk	Cow meat	Cow liver	Sheep meat	Sheep liver
^{3}H	$2.05\ 10^{-3}$	$2.0\ 10^{-3}$	$2.0\ 10^{-3}$	$9.1\ 10^{-4}$	$7.8\ 10^{-4}$	$7.8\ 10^{-4}$	$1.2\ 10^{-3}$	$1.2\ 10^{-3}$
^{14}C [a]	$3.7\ 10^{-1}$	$3.7\ 10^{-1}$	$3.6\ 10^{-1}$	$4.9\ 10^{-1}$	$1.9\ 10^{0}$	$1.9\ 10^{0}$	$3.8\ 10^{0}$	$3.8\ 10^{0}$
^{35}S [a]	$6.1\ 10^{-1}$	$7.7\ 10^{-1}$	$4.4\ 10^{-1}$	$4.6\ 10^{-1}$	$8.0\ 10^{-1}$	$8.0\ 10^{-1}$	$2.6\ 10^{0}$	$2.6\ 10^{0}$
^{60}Co	$3.2\ 10^{-3}$	$1.9\ 10^{-3}$	$4.1\ 10^{-5}$	$4.2\ 10^{-3}$	$1.1\ 10^{-3}$	$1.1\ 10^{-1}$	$9.7\ 10^{-4}$	$9.7\ 10^{-2}$
^{90}Sr	$3.8\ 10^{-3}$	$2.1\ 10^{-3}$	$1.2\ 10^{-4}$	$2.3\ 10^{-3}$	$4.8\ 10^{-4}$	$4.8\ 10^{-4}$	$3.6\ 10^{-4}$	$3.6\ 10^{-4}$
^{106}Ru	$2.9\ 10^{-3}$	$3.5\ 10^{-4}$	$1.5\ 10^{-5}$	$1.8\ 10^{-6}$	$6.6\ 10^{-4}$	$6.6\ 10^{-4}$	$6.3\ 10^{-4}$	$6.3\ 10^{-4}$
^{125}Sb	$3.2\ 10^{-3}$	$1.9\ 10^{-3}$	$3.8\ 10^{-5}$	$2.0\ 10^{-4}$	$2.0\ 10^{-3}$	$2.0\ 10^{-1}$	$1.8\ 10^{-3}$	$1.8\ 10^{-1}$
^{129}I	$3.8\ 10^{-3}$	$3.7\ 10^{-2}$	$9.7\ 10^{-3}$	$1.1\ 10^{-2}$	$7.5\ 10^{-3}$	$7.5\ 10^{-3}$	$9.5\ 10^{-3}$	$9.5\ 10^{-3}$
^{131}I	$1.3\ 10^{-3}$	$3.0\ 10^{-3}$	$2.7\ 10^{-4}$	$1.8\ 10^{-3}$	$7.8\ 10^{-4}$	$7.8\ 10^{-4}$	$1.0\ 10^{-3}$	$1.0\ 10^{-3}$
^{137}Cs	$3.7\ 10^{-3}$	$3.7\ 10^{-2}$	$9.5\ 10^{-3}$	$1.1\ 10^{-2}$	$5.5\ 10^{-2}$	$5.5\ 10^{-2}$	$4.6\ 10^{-2}$	$4.6\ 10^{-2}$
^{239}Pu	$3.0\ 10^{-3}$	$3.4\ 10^{-4}$	$1.1\ 10^{-7}$	$8.9\ 10^{-7}$	$4.9\ 10^{-5}$	$5.9\ 10^{-3}$	$5.6\ 10^{-5}$	$3.9\ 10^{-3}$
^{241}Pu	$3.0\ 10^{-3}$	$3.3\ 10^{-4}$	$1.1\ 10^{-7}$	$8.7\ 10^{-7}$	$4.8\ 10^{-5}$	$5.8\ 10^{-3}$	$5.5\ 10^{-5}$	$3.9\ 10^{-3}$
^{241}Am	$3.0\ 10^{-3}$	$3.4\ 10^{-4}$	$1.7\ 10^{-7}$	$8.9\ 10^{-7}$	$4.9\ 10^{-5}$	$5.9\ 10^{-3}$	$5.6\ 10^{-5}$	$3.9\ 10^{-3}$
^{242}Cm	$2.8\ 10^{-3}$	$3.1\ 10^{-4}$	$3.2\ 10^{-8}$	$4.1\ 10^{-7}$	$2.2\ 10^{-5}$	$2.7\ 10^{-3}$	$3.2\ 10^{-5}$	$2.2\ 10^{-3}$
^{244}Cm	$3.0\ 10^{-3}$	$3.3\ 10^{-4}$	$6.3\ 10^{-8}$	$8.8\ 10^{-7}$	$4.8\ 10^{-5}$	$5.8\ 10^{-3}$	$5.5\ 10^{-5}$	$3.9\ 10^{-3}$

[a] Units are Bq y kg^{-1} per Bq m^{-3}

Table A4 Activity concentrations in foods for cautious short-term assessment integrated to 1 year (Bq y kg^{-1} per Bq m^{-2} or Bq y kg^{-1} per Bq m^{-3}) [a]

	Green vegetables	Fruit	Root vegetables	Cow milk	Cow meat	Cow liver	Sheep meat	Sheep liver
^{3}H	$1.6\ 10^{-2}$	$1.6\ 10^{-2}$	$1.6\ 10^{-2}$	$9.1\ 10^{-4}$	$7.8\ 10^{-4}$	$7.8\ 10^{-4}$	$1.2\ 10^{-3}$	$1.2\ 10^{-3}$
^{14}C [b]	$1.4\ 10^{-1}$	$1.8\ 10^{-1}$	$1.5\ 10^{-1}$	$4.1\ 10^{-2}$	$1.6\ 10^{-1}$	$1.6\ 10^{-1}$	$3.1\ 10^{-1}$	$3.1\ 10^{-1}$
^{35}S [b]	$7.8\ 10^{-2}$	$9.3\ 10^{-2}$	$4.4\ 10^{-2}$	$3.8\ 10^{-2}$	$6.6\ 10^{-2}$	$6.6\ 10^{-2}$	$2.2\ 10^{-1}$	$2.2\ 10^{-1}$
^{60}Co	$5.6\ 10^{-2}$	$2.9\ 10^{-3}$	$4.5\ 10^{-5}$	$4.2\ 10^{-3}$	$1.1\ 10^{-3}$	$1.1\ 10^{-1}$	$9.7\ 10^{-4}$	$9.7\ 10^{-2}$
^{90}Sr	$5.9\ 10^{-2}$	$3.2\ 10^{-3}$	$1.4\ 10^{-4}$	$2.3\ 10^{-3}$	$4.8\ 10^{-4}$	$4.8\ 10^{-4}$	$3.6\ 10^{-4}$	$3.6\ 10^{-4}$
^{106}Ru	$4.3\ 10^{-2}$	$1.7\ 10^{-3}$	$1.4\ 10^{-5}$	$1.8\ 10^{-6}$	$6.6\ 10^{-4}$	$6.6\ 10^{-4}$	$6.3\ 10^{-4}$	$6.3\ 10^{-4}$
^{125}Sb	$5.3\ 10^{-2}$	$2.7\ 10^{-3}$	$4.1\ 10^{-5}$	$2.0\ 10^{-4}$	$2.0\ 10^{-3}$	$2.0\ 10^{-1}$	$1.8\ 10^{-3}$	$1.8\ 10^{-1}$
^{129}I	$6.0\ 10^{-2}$	$8.2\ 10^{-2}$	$2.3\ 10^{-2}$	$1.1\ 10^{-2}$	$7.5\ 10^{-3}$	$7.5\ 10^{-3}$	$9.5\ 10^{-3}$	$9.5\ 10^{-3}$
^{131}I	$1.9\ 10^{-3}$	$5.3\ 10^{-4}$	$1.3\ 10^{-4}$	$1.8\ 10^{-3}$	$7.8\ 10^{-4}$	$7.8\ 10^{-4}$	$1.0\ 10^{-3}$	$1.0\ 10^{-3}$
^{137}Cs	$5.9\ 10^{-2}$	$8.0\ 10^{-2}$	$2.2\ 10^{-2}$	$1.1\ 10^{-2}$	$5.5\ 10^{-2}$	$5.5\ 10^{-2}$	$4.6\ 10^{-2}$	$4.6\ 10^{-2}$
^{239}Pu	$6.0\ 10^{-2}$	$2.3\ 10^{-3}$	$1.1\ 10^{-7}$	$8.9\ 10^{-7}$	$4.9\ 10^{-5}$	$5.9\ 10^{-3}$	$5.6\ 10^{-5}$	$3.9\ 10^{-3}$
^{241}Pu	$5.9\ 10^{-2}$	$2.2\ 10^{-3}$	$1.1\ 10^{-7}$	$8.7\ 10^{-7}$	$4.8\ 10^{-5}$	$5.8\ 10^{-3}$	$5.5\ 10^{-5}$	$3.9\ 10^{-3}$
^{241}Am	$6.0\ 10^{-2}$	$2.3\ 10^{-3}$	$1.8\ 10^{-7}$	$8.9\ 10^{-7}$	$4.9\ 10^{-5}$	$5.9\ 10^{-3}$	$5.6\ 10^{-5}$	$3.9\ 10^{-3}$
^{242}Cm	$3.1\ 10^{-2}$	$1.2\ 10^{-3}$	$2.7\ 10^{-8}$	$4.1\ 10^{-7}$	$2.2\ 10^{-5}$	$2.7\ 10^{-3}$	$3.2\ 10^{-5}$	$2.2\ 10^{-3}$
^{244}Cm	$5.9\ 10^{-2}$	$2.3\ 10^{-3}$	$6.5\ 10^{-8}$	$8.8\ 10^{-7}$	$4.8\ 10^{-5}$	$5.8\ 10^{-3}$	$5.5\ 10^{-5}$	$3.9\ 10^{-3}$

[a] Activity concentrations in vegetables are based on peaks which are then integrated taking account of radioactive decay
[b] Units are Bq y kg^{-1} per Bq m^{-3}

Table A5 Delay times (days)[a]

Foodstuff	Continuous release	Short-term release
Green vegetables	0	0
Soft fruit	0	0
Potatoes	0	0
Carrots	0	0
Milk	0	0
Milk products	2	2
Cow meat	0	3
Cow offal (liver)	2	1
Sheep meat	0	1
Sheep offal (liver)	0	1

[a] Delay times for a continuous release assessment were taken from PC-CREAM 98 [Ref A8] while those for a short-term release assessment were taken from NRPB-W54 [Ref A1]. It is noted that there are inconsistencies but these do not have a large effect on the dose results for the radionuclides considered in this report.

Table A6 Ingestion rates (kg yr^{-1}) [Ref A12]

Food	Adult		Child (aged 10-11yrs)		Infant	
	95th percentile	Average	95th percentile	Average	95th percentile	Average
Green vegetables	$7.0\ 10^{1}$	$3.0\ 10^{1}$	$3.0\ 10^{1}$	$1.0\ 10^{1}$	$1.5\ 10^{1}$	$5.0\ 10^{0}$
Soft fruit	$6.0\ 10^{1}$	$1.5\ 10^{1}$	$4.0\ 10^{1}$	$1.5\ 10^{1}$	$2.5\ 10^{1}$	$7.5\ 10^{0}$
Potatoes	$1.0\ 10^{2}$	$5.0\ 10^{1}$	$7.5\ 10^{1}$	$4.5\ 10^{1}$	$2.5\ 10^{1}$	$1.0\ 10^{1}$
Milk	$2.1\ 10^{2}$	$9.5\ 10^{1}$	$2.2\ 10^{2}$	$1.1\ 10^{2}$	$2.9\ 10^{2}$	$1.2\ 10^{2}$
Milk products	$5.0\ 10^{1}$	$2.0\ 10^{1}$	$4.0\ 10^{1}$	$1.5\ 10^{1}$	$4.0\ 10^{1}$	$1.5\ 10^{1}$
Cow meat	$4.0\ 10^{1}$	$1.5\ 10^{1}$	$2.5\ 10^{1}$	$1.0\ 10^{1}$	$8.0\ 10^{0}$	$3.0\ 10^{0}$
Cow offal (liver)	$7.5\ 10^{0}$	$1.0\ 10^{0}$	$4.5\ 10^{0}$	$5.0\ 10^{-1}$	$1.8\ 10^{0}$	$2.0\ 10^{-1}$
Sheep meat	$2.0\ 10^{1}$	$3.0\ 10^{0}$	$1.0\ 10^{1}$	$1.5\ 10^{0}$	$2.0\ 10^{0}$	$6.0\ 10^{-1}$
Sheep offal (liver)	$7.5\ 10^{0}$	$1.0\ 10^{0}$	$4.5\ 10^{0}$	$5.0\ 10^{-1}$	$1.8\ 10^{0}$	$2.0\ 10^{-1}$

Table A7 Dose coefficients for ingestion ($Sv\ Bq^{-1}$) [Ref A13]

Radionuclide	Infant	Child	Adult
^{3}H	$6.2\ 10^{-11}$	$3.0\ 10^{-11}$	$2.3\ 10^{-11}$
^{14}C [a]	$1.6\ 10^{-9}$	$8.0\ 10^{-10}$	$5.8\ 10^{-10}$
^{35}S [b]	$5.4\ 10^{-9}$	$1.6\ 10^{-9}$	$7.7\ 10^{-10}$
^{60}Co	$2.7\ 10^{-8}$	$1.1\ 10^{-8}$	$3.4\ 10^{-9}$
^{90}Sr	$7.3\ 10^{-8}$	$6.0\ 10^{-8}$	$2.8\ 10^{-8}$
^{106}Ru	$4.9\ 10^{-8}$	$1.5\ 10^{-8}$	$7.0\ 10^{-9}$
^{125}Sb	$6.1\ 10^{-9}$	$2.1\ 10^{-9}$	$1.1\ 10^{-9}$
^{129}I	$2.2\ 10^{-7}$	$1.9\ 10^{-7}$	$1.1\ 10^{-7}$
^{131}I	$1.8\ 10^{-7}$	$5.2\ 10^{-8}$	$2.2\ 10^{-8}$
^{137}Cs	$1.2\ 10^{-8}$	$1.0\ 10^{-8}$	$1.3\ 10^{-8}$
^{239}Pu	$4.2\ 10^{-7}$	$2.7\ 10^{-7}$	$2.5\ 10^{-7}$
^{241}Pu	$5.7\ 10^{-9}$	$5.1\ 10^{-9}$	$4.8\ 10^{-9}$
^{241}Am	$3.7\ 10^{-7}$	$2.2\ 10^{-7}$	$2.0\ 10^{-7}$
^{242}Cm	$7.6\ 10^{-8}$	$2.4\ 10^{-8}$	$1.2\ 10^{-8}$
^{244}Cm	$2.9\ 10^{-7}$	$1.4\ 10^{-7}$	$1.2\ 10^{-7}$

[a] The dose coefficient for ^{3}H was calculated assuming a 20% contribution from OBT and 80% from HTO.
[b] For ^{35}S the organic form was assumed.

Table A8 Dose coefficients for inhalation ($Sv\ Bq^{-1}$) [Ref A13]

Radionuclide	Absorption Type	Infant	Child	Adult
^{3}H [a]	-	$4.8\ 10^{-11}$	$2.3\ 10^{-11}$	$1.8\ 10^{-11}$
^{14}C	M	$4.1\ 10^{-9}$	$1.8\ 10^{-9}$	$1.3\ 10^{-9}$
^{35}S	M	$4.5\ 10^{-9}$	$2.0\ 10^{-9}$	$1.4\ 10^{-9}$
^{60}Co	M	$3.4\ 10^{-8}$	$1.5\ 10^{-8}$	$1.0\ 10^{-8}$
^{90}Sr	M	$1.1\ 10^{-7}$	$5.1\ 10^{-8}$	$3.6\ 10^{-8}$
^{106}Ru	M	$1.1\ 10^{-7}$	$4.1\ 10^{-8}$	$2.8\ 10^{-8}$
^{125}Sb	M	$1.6\ 10^{-8}$	$6.8\ 10^{-9}$	$4.8\ 10^{-9}$
^{129}I	F	$8.6\ 10^{-8}$	$6.7\ 10^{-8}$	$3.6\ 10^{-8}$
^{131}I	F	$7.2\ 10^{-8}$	$1.9\ 10^{-8}$	$7.4\ 10^{-9}$
^{137}Cs	F	$5.4\ 10^{-9}$	$3.7\ 10^{-9}$	$4.6\ 10^{-9}$
^{239}Pu	M	$7.7\ 10^{-5}$	$4.8\ 10^{-5}$	$5.0\ 10^{-5}$
^{241}Pu	M	$9.7\ 10^{-7}$	$8.3\ 10^{-7}$	$9.0\ 10^{-7}$
^{241}Am	M	$6.9\ 10^{-5}$	$4.0\ 10^{-5}$	$4.2\ 10^{-5}$
^{242}Cm	M	$1.8\ 10^{-5}$	$7.3\ 10^{-6}$	$5.2\ 10^{-6}$
^{244}Cm	M	$5.7\ 10^{-5}$	$2.7\ 10^{-5}$	$2.7\ 10^{-5}$

[a] ^{3}H was assumed to be in form of tritiated water

Table A9 Dose coefficients for positron emitters [Ref A9]

Radionuclide	Type	External dose from immersion in plume (Sv h^{-1} per Bq m^{-3})	Dose coefficient for inhalation (Sv Bq^{-1})		
			Adult	Child	Infant
^{11}C	1 µm AMAD aerosol (Type F)	$1.8\ 10^{-10}$	$1.1\ 10^{-11}$	$2.1\ 10^{-11}$	$7.0\ 10^{-11}$
^{15}O	SR-2 (soluble reactive gas)	$1.8\ 10^{-10}$	$4.7\ 10^{-13}$	– [b]	– [b]
^{18}F	1 µm AMAD aerosol (Type F)	$1.8\ 10^{-10}$	$2.8\ 10^{-11}$	$5.6\ 10^{-11}$	$1.9\ 10^{-10}$

[b] Inhalation dose coefficients for ^{15}O could be estimated for children and infants by appropriate scaling however this has not been done in this report.

Table A10 Adult annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 1a) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$1.9\ 10^{-1}$	$1.4\ 10^{-1}$	$1.6\ 10^{-2}$	$1.1\ 10^{-3}$	$5.0\ 10^{-3}$	$1.7\ 10^{-3}$	$2.7\ 10^{-1}$	-	$4.1\ 10^{-2}$	-	-	-	$1.6\ 10^{0}$	-	$2.3\ 10^{0}$
^{14}C	$4.8\ 10^{0}$	$3.3\ 10^{0}$	$5.3\ 10^{0}$	$3.5\ 10^{-1}$	$7.0\ 10^{-1}$	$2.1\ 10^{0}$	$1.9\ 10^{1}$	-	$1.0\ 10^{0}$	$2.0\ 10^{-3}$	-	-	$1.3\ 10^{2}$	-	$1.6\ 10^{2}$
^{35}S	$9.5\ 10^{0}$	$4.9\ 10^{0}$	$2.6\ 10^{0}$	$1.8\ 10^{-1}$	$5.7\ 10^{-1}$	$1.7\ 10^{0}$	$2.2\ 10^{1}$	-	$2.6\ 10^{0}$	$6.5\ 10^{-3}$	-	-	$1.3\ 10^{2}$	-	$1.7\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$7.0\ 10^{-2}$	$1.1\ 10^{0}$	-	-	-	$1.2\ 10^{0}$
^{60}Co	$1.9\ 10^{1}$	$1.7\ 10^{-1}$	$1.4\ 10^{0}$	$9.4\ 10^{0}$	$2.4\ 10^{-1}$	$8.1\ 10^{0}$	$7.5\ 10^{1}$	-	$2.4\ 10^{0}$	$1.2\ 10^{-2}$	$2.1\ 10^{0}$	$8.6\ 10^{3}$	$9.5\ 10^{2}$	-	$9.7\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$3.6\ 10^{-2}$	$2.2\ 10^{-3}$	-	-	-	$3.8\ 10^{-2}$
^{90}Sr	$1.8\ 10^{2}$	$4.4\ 10^{0}$	$5.0\ 10^{0}$	$3.4\ 10^{-1}$	$7.6\ 10^{-1}$	$2.5\ 10^{-1}$	$3.3\ 10^{2}$	-	$2.2\ 10^{1}$	$2.7\ 10^{-2}$	$5.6\ 10^{-11}$	$1.9\ 10^{-4}$	$3.4\ 10^{3}$	-	$4.0\ 10^{3}$
^{106}Ru	$3.5\ 10^{1}$	$1.3\ 10^{-1}$	$1.7\ 10^{0}$	$1.2\ 10^{-1}$	$3.3\ 10^{-1}$	$1.1\ 10^{-1}$	$6.5\ 10^{-2}$	-	$9.0\ 10^{-1}$	$2.0\ 10^{-1}$	$1.5\ 10^{-1}$	$5.7\ 10^{2}$	$2.7\ 10^{3}$	$1.7\ 10^{0}$	$3.3\ 10^{3}$
^{125}Sb	$6.0\ 10^{0}$	$5.2\ 10^{-2}$	$8.0\ 10^{-1}$	$5.4\ 10^{0}$	$1.5\ 10^{-1}$	$4.9\ 10^{0}$	$1.2\ 10^{0}$	-	$7.6\ 10^{-1}$	$1.3\ 10^{-2}$	$4.2\ 10^{-1}$	$1.4\ 10^{3}$	$4.6\ 10^{2}$	-	$1.8\ 10^{3}$
^{129}I	$3.5\ 10^{3}$	$6.3\ 10^{3}$	$1.5\ 10^{3}$	$9.9\ 10^{1}$	$3.7\ 10^{2}$	$1.2\ 10^{2}$	$3.1\ 10^{4}$	-	$7.4\ 10^{3}$	$1.5\ 10^{-3}$	$2.0\ 10^{-2}$	$1.8\ 10^{2}$	$2.9\ 10^{3}$	-	$5.3\ 10^{4}$
^{131}I	$2.3\ 10^{2}$	$3.6\ 10^{1}$	$2.4\ 10^{1}$	$1.9\ 10^{0}$	$7.3\ 10^{0}$	$2.4\ 10^{0}$	$1.0\ 10^{3}$	-	$1.2\ 10^{2}$	$2.7\ 10^{-2}$	$3.4\ 10^{-1}$	$3.4\ 10^{2}$	$6.0\ 10^{2}$	-	$2.4\ 10^{3}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$1.5\ 10^{-2}$	$5.5\ 10^{-2}$	-	-	-	$7.0\ 10^{-2}$
^{137}Cs	$8.4\ 10^{1}$	$1.5\ 10^{2}$	$2.7\ 10^{2}$	$1.8\ 10^{1}$	$4.5\ 10^{1}$	$1.5\ 10^{1}$	$7.4\ 10^{2}$	-	$1.8\ 10^{2}$	$3.8\ 10^{-2}$	$1.1\ 10^{-1}$	$2.1\ 10^{3}$	$4.4\ 10^{2}$	$3.0\ 10^{-1}$	$4.1\ 10^{3}$
^{239}Pu	$1.3\ 10^{3}$	$3.3\ 10^{-2}$	$4.6\ 10^{0}$	$3.7\ 10^{1}$	$1.0\ 10^{0}$	$2.4\ 10^{1}$	$1.2\ 10^{0}$	-	$3.1\ 10^{1}$	$7.9\ 10^{-4}$	$2.4\ 10^{-4}$	$2.7\ 10^{-1}$	$4.8\ 10^{6}$	$3.3\ 10^{3}$	$4.8\ 10^{6}$
^{241}Pu	$2.5\ 10^{1}$	$6.2\ 10^{-4}$	$8.5\ 10^{-2}$	$6.9\ 10^{-1}$	$2.0\ 10^{-2}$	$4.6\ 10^{-1}$	$2.2\ 10^{-2}$	-	$6.0\ 10^{-1}$	$3.3\ 10^{-8}$	$2.2\ 10^{-6}$	$4.8\ 10^{-2}$	$8.6\ 10^{4}$	$5.8\ 10^{1}$	$8.6\ 10^{4}$
^{241}Am	$1.0\ 10^{3}$	$4.3\ 10^{-2}$	$3.6\ 10^{0}$	$2.9\ 10^{1}$	$8.3\ 10^{-1}$	$2.0\ 10^{1}$	$9.3\ 10^{-1}$	-	$2.5\ 10^{1}$	$2.9\ 10^{-5}$	$3.3\ 10^{-2}$	$5.6\ 10^{1}$	$4.0\ 10^{6}$	$2.7\ 10^{3}$	$4.0\ 10^{6}$
^{242}Cm	$5.8\ 10^{1}$	$4.8\ 10^{-4}$	$9.8\ 10^{-2}$	$7.9\ 10^{-1}$	$2.9\ 10^{-2}$	$6.6\ 10^{-1}$	$2.5\ 10^{-2}$	-	$1.4\ 10^{0}$	$9.1\ 10^{-10}$	$5.7\ 10^{-4}$	-	$4.9\ 10^{5}$	$2.9\ 10^{2}$	$4.9\ 10^{5}$
^{244}Cm	$6.2\ 10^{2}$	$9.4\ 10^{-3}$	$2.1\ 10^{0}$	$1.7\ 10^{1}$	$4.9\ 10^{-1}$	$1.2\ 10^{1}$	$5.5\ 10^{-1}$	-	$1.5\ 10^{1}$	-	$7.0\ 10^{-4}$	-	$2.9\ 10^{6}$	$2.0\ 10^{3}$	$3.0\ 10^{6}$

Table A11 Adult annual doses per unit release (1 TBq) for a cautious (Cat D) short-term release assessment (scenario 1b) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	2.9 10^{0}	2.1 10^{0}	3.0 10^{-2}	2.0 10^{-3}	9.0 10^{-3}	3.0 10^{-3}	4.8 10^{-1}	2.0 10^{-2}	6.2 10^{-1}	-	-	-	3.0 10^{0}	-	9.1 10^{0}
^{14}C	7.7 10^{1}	6.0 10^{1}	1.9 10^{1}	1.3 10^{0}	2.5 10^{0}	7.6 10^{0}	6.9 10^{1}	4.0 10^{1}	2.2 10^{1}	2.7 10^{-3}	-	-	2.4 10^{2}	-	5.4 10^{2}
^{35}S	5.2 10^{1}	2.1 10^{1}	9.3 10^{0}	6.3 10^{-1}	2.0 10^{0}	6.1 10^{0}	7.7 10^{1}	8.0 10^{1}	1.3 10^{1}	8.8 10^{-3}	-	-	2.4 10^{2}	-	5.0 10^{2}
^{41}Ar	-	-	-	-	-	-	-	-	-	9.4 10^{-2}	2.9 10^{0}	-	-	-	3.0 10^{0}
^{60}Co	1.5 10^{3}	8.7 10^{-1}	6.5 10^{0}	4.3 10^{1}	1.1 10^{0}	3.8 10^{1}	3.5 10^{2}	3.6 10^{2}	1.7 10^{1}	1.7 10^{-2}	5.6 10^{0}	2.0 10^{4}	1.8 10^{3}	-	2.4 10^{4}
^{85}Kr	-	-	-	-	-	-	-	-	-	4.8 10^{-2}	4.9 10^{-3}	-	-	-	5.3 10^{-2}
^{90}Sr	1.3 10^{4}	2.2 10^{1}	2.3 10^{1}	1.6 10^{0}	3.5 10^{0}	1.2 10^{0}	1.5 10^{3}	1.6 10^{3}	1.5 10^{2}	3.7 10^{-2}	1.3 10^{-10}	4.2 10^{-4}	6.5 10^{3}	-	2.3 10^{4}
^{106}Ru	2.4 10^{3}	5.6 10^{-1}	7.9 10^{0}	5.3 10^{-1}	1.5 10^{0}	5.1 10^{-1}	3.0 10^{-1}	3.1 10^{-1}	2.0 10^{1}	2.7 10^{-1}	3.1 10^{-1}	1.3 10^{3}	5.0 10^{3}	3.8 10^{0}	8.8 10^{3}
^{125}Sb	4.7 10^{2}	2.6 10^{-1}	3.7 10^{0}	2.5 10^{1}	6.8 10^{-1}	2.3 10^{1}	5.4 10^{0}	5.6 10^{0}	5.1 10^{0}	1.8 10^{-2}	9.3 10^{-1}	3.1 10^{3}	8.6 10^{2}	-	4.5 10^{3}
^{129}I	1.3 10^{5}	3.4 10^{4}	3.4 10^{3}	2.3 10^{2}	8.6 10^{2}	2.9 10^{2}	7.1 10^{4}	7.4 10^{4}	3.7 10^{4}	2.0 10^{-3}	4.5 10^{-2}	2.7 10^{2}	5.6 10^{3}	-	3.5 10^{5}
^{131}I	8.0 10^{2}	3.8 10^{1}	5.5 10^{1}	4.3 10^{0}	1.7 10^{1}	5.6 10^{0}	2.3 10^{3}	2.1 10^{3}	4.8 10^{1}	3.6 10^{-2}	7.7 10^{-1}	5.0 10^{2}	1.1 10^{3}	-	7.0 10^{3}
^{133}Xe	-	-	-	-	-	-	-	-	-	2.0 10^{-2}	1.3 10^{-1}	-	-	-	1.5 10^{-1}
^{137}Cs	6.2 10^{3}	1.7 10^{3}	1.2 10^{3}	8.2 10^{1}	2.1 10^{2}	6.8 10^{1}	3.4 10^{3}	1.1 10^{3}	1.8 10^{3}	5.1 10^{-2}	2.4 10^{-1}	4.8 10^{3}	8.3 10^{2}	6.8 10^{-1}	2.1 10^{4}
^{239}Pu	1.2 10^{5}	1.6 10^{-1}	2.1 10^{1}	1.7 10^{2}	4.8 10^{0}	1.1 10^{2}	5.4 10^{0}	5.6 10^{0}	9.8 10^{2}	1.1 10^{-3}	5.4 10^{-4}	6.2 10^{-1}	9.0 10^{6}	7.5 10^{3}	9.1 10^{6}
^{241}Pu	2.3 10^{3}	2.9 10^{-3}	3.9 10^{-1}	3.2 10^{0}	9.0 10^{-2}	2.1 10^{0}	1.0 10^{-1}	1.1 10^{-1}	1.8 10^{1}	4.5 10^{-8}	5.3 10^{-6}	1.1 10^{-1}	1.6 10^{5}	1.3 10^{2}	1.6 10^{5}
^{241}Am	9.6 10^{4}	2.0 10^{-1}	1.7 10^{1}	1.4 10^{2}	3.8 10^{0}	9.0 10^{1}	4.3 10^{0}	4.5 10^{0}	7.9 10^{2}	3.9 10^{-5}	7.5 10^{-2}	1.3 10^{2}	7.6 10^{6}	6.3 10^{3}	7.7 10^{6}
^{242}Cm	2.9 10^{3}	1.9 10^{-3}	4.5 10^{-1}	3.6 10^{0}	1.3 10^{-1}	3.1 10^{0}	1.2 10^{-1}	1.2 10^{-1}	2.4 10^{1}	1.2 10^{-9}	1.3 10^{-3}	-	9.3 10^{5}	6.5 10^{2}	9.4 10^{5}
^{244}Cm	5.7 10^{4}	4.4 10^{-2}	9.9 10^{0}	8.0 10^{1}	2.3 10^{0}	5.3 10^{1}	2.5 10^{0}	2.6 10^{0}	4.6 10^{2}	-	1.5 10^{-3}	-	5.6 10^{6}	4.6 10^{3}	5.6 10^{6}

Table A12 Adult annual doses per unit release (1 TBq) for a cautious (Cat F) short-term release assessment (scenario 1c) (μSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$1.0\ 10^{1}$	$7.1\ 10^{0}$	$1.0\ 10^{-1}$	$6.9\ 10^{-3}$	$3.1\ 10^{-2}$	$1.0\ 10^{-2}$	$1.7\ 10^{0}$	$7.0\ 10^{-2}$	$2.1\ 10^{0}$	-	-	-	$9.0\ 10^{0}$	-	$3.0\ 10^{1}$
^{14}C	$3.5\ 10^{2}$	$2.7\ 10^{2}$	$8.7\ 10^{1}$	$5.8\ 10^{0}$	$1.1\ 10^{1}$	$3.4\ 10^{1}$	$3.1\ 10^{2}$	$1.8\ 10^{2}$	$9.8\ 10^{1}$	$9.5\ 10^{-3}$	-	-	$8.4\ 10^{2}$	-	$2.2\ 10^{3}$
^{35}S	$1.9\ 10^{2}$	$7.8\ 10^{1}$	$3.4\ 10^{1}$	$2.3\ 10^{0}$	$7.5\ 10^{0}$	$2.3\ 10^{1}$	$2.9\ 10^{2}$	$2.9\ 10^{2}$	$4.9\ 10^{1}$	$2.7\ 10^{-2}$	-	-	$7.4\ 10^{2}$	-	$1.7\ 10^{3}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$3.3\ 10^{-1}$	$7.7\ 10^{0}$	-	-	-	$8.0\ 10^{0}$
^{60}Co	$1.4\ 10^{3}$	$7.9\ 10^{-1}$	$5.9\ 10^{0}$	$3.9\ 10^{1}$	$1.0\ 10^{0}$	$3.4\ 10^{1}$	$3.1\ 10^{2}$	$3.3\ 10^{2}$	$1.5\ 10^{1}$	$5.6\ 10^{-2}$	$1.5\ 10^{1}$	$3.2\ 10^{4}$	$6.1\ 10^{3}$	-	$4.0\ 10^{4}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$1.7\ 10^{-1}$	$1.3\ 10^{-2}$	-	-	-	$1.8\ 10^{-1}$
^{90}Sr	$1.2\ 10^{4}$	$2.0\ 10^{1}$	$2.1\ 10^{1}$	$1.4\ 10^{0}$	$3.2\ 10^{0}$	$1.1\ 10^{0}$	$1.4\ 10^{3}$	$1.5\ 10^{3}$	$1.4\ 10^{2}$	$1.3\ 10^{-1}$	$8.5\ 10^{-10}$	$6.8\ 10^{-4}$	$2.2\ 10^{4}$	-	$3.7\ 10^{4}$
^{106}Ru	$2.2\ 10^{3}$	$5.1\ 10^{-1}$	$7.2\ 10^{0}$	$4.8\ 10^{-1}$	$1.4\ 10^{0}$	$4.6\ 10^{-1}$	$2.7\ 10^{-1}$	$2.8\ 10^{-1}$	$1.8\ 10^{1}$	$9.1\ 10^{-1}$	$1.1\ 10^{0}$	$2.1\ 10^{3}$	$1.7\ 10^{4}$	$6.1\ 10^{0}$	$2.2\ 10^{4}$
^{125}Sb	$4.2\ 10^{2}$	$2.3\ 10^{-1}$	$3.4\ 10^{0}$	$2.2\ 10^{1}$	$6.1\ 10^{-1}$	$2.1\ 10^{1}$	$4.9\ 10^{0}$	$5.1\ 10^{0}$	$4.7\ 10^{0}$	$6.1\ 10^{-2}$	$2.4\ 10^{0}$	$5.0\ 10^{3}$	$3.0\ 10^{3}$	-	$8.4\ 10^{3}$
^{129}I	$2.6\ 10^{5}$	$7.0\ 10^{4}$	$7.0\ 10^{3}$	$4.6\ 10^{2}$	$1.8\ 10^{3}$	$5.8\ 10^{2}$	$1.4\ 10^{5}$	$1.5\ 10^{5}$	$7.5\ 10^{4}$	$5.2\ 10^{-3}$	$1.1\ 10^{-1}$	$6.2\ 10^{2}$	$1.5\ 10^{4}$	-	$7.2\ 10^{5}$
^{131}I	$1.6\ 10^{3}$	$7.7\ 10^{1}$	$1.1\ 10^{2}$	$8.8\ 10^{0}$	$3.4\ 10^{1}$	$1.1\ 10^{1}$	$4.8\ 10^{3}$	$4.2\ 10^{3}$	$9.8\ 10^{1}$	$9.4\ 10^{-2}$	$1.7\ 10^{0}$	$1.2\ 10^{3}$	$3.0\ 10^{3}$	-	$1.5\ 10^{4}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$7.1\ 10^{-2}$	$3.5\ 10^{-1}$	-	-	-	$4.2\ 10^{-1}$
^{137}Cs	$5.6\ 10^{3}$	$1.5\ 10^{3}$	$1.1\ 10^{3}$	$7.4\ 10^{1}$	$1.9\ 10^{2}$	$6.2\ 10^{1}$	$3.1\ 10^{3}$	$1.0\ 10^{3}$	$1.6\ 10^{3}$	$1.7\ 10^{-1}$	$1.2\ 10^{0}$	$7.8\ 10^{3}$	$2.8\ 10^{3}$	$1.1\ 10^{0}$	$2.5\ 10^{4}$
^{239}Pu	$1.1\ 10^{5}$	$1.4\ 10^{-1}$	$1.9\ 10^{1}$	$1.5\ 10^{2}$	$4.3\ 10^{0}$	$1.0\ 10^{2}$	$4.9\ 10^{0}$	$5.1\ 10^{0}$	$8.9\ 10^{2}$	$3.6\ 10^{-3}$	$1.6\ 10^{-3}$	$9.9\ 10^{-1}$	$3.1\ 10^{7}$	$1.2\ 10^{4}$	$3.1\ 10^{7}$
^{241}Pu	$2.0\ 10^{3}$	$2.7\ 10^{-3}$	$3.6\ 10^{-1}$	$2.9\ 10^{0}$	$8.1\ 10^{-2}$	$1.9\ 10^{0}$	$9.1\ 10^{-2}$	$9.5\ 10^{-2}$	$1.7\ 10^{1}$	$1.5\ 10^{-7}$	$1.4\ 10^{-5}$	$1.8\ 10^{-1}$	$5.5\ 10^{5}$	$2.1\ 10^{2}$	$5.6\ 10^{5}$
^{241}Am	$8.7\ 10^{4}$	$1.8\ 10^{-1}$	$1.5\ 10^{1}$	$1.2\ 10^{2}$	$3.5\ 10^{0}$	$8.2\ 10^{1}$	$3.9\ 10^{0}$	$4.1\ 10^{0}$	$7.1\ 10^{2}$	$1.3\ 10^{-4}$	$2.0\ 10^{-1}$	$2.1\ 10^{2}$	$2.6\ 10^{7}$	$1.0\ 10^{4}$	$2.6\ 10^{7}$
^{242}Cm	$2.7\ 10^{3}$	$1.7\ 10^{-3}$	$4.1\ 10^{-1}$	$3.3\ 10^{0}$	$1.2\ 10^{-1}$	$2.8\ 10^{0}$	$1.1\ 10^{-1}$	$1.1\ 10^{-1}$	$2.2\ 10^{1}$	$4.2\ 10^{-9}$	$3.9\ 10^{-3}$	-	$3.2\ 10^{6}$	$1.0\ 10^{3}$	$3.2\ 10^{6}$
^{244}Cm	$5.1\ 10^{4}$	$4.0\ 10^{-2}$	$9.0\ 10^{0}$	$7.2\ 10^{1}$	$2.0\ 10^{0}$	$4.8\ 10^{1}$	$2.3\ 10^{0}$	$2.4\ 10^{0}$	$4.2\ 10^{2}$	-	$4.5\ 10^{-3}$	-	$1.9\ 10^{7}$	$7.4\ 10^{3}$	$1.9\ 10^{7}$

Table A13 Adult annual doses per unit release (1 TBq y^{-1}) for a continuous release assessment (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$7.4\ 10^{-3}$	$5.6\ 10^{-3}$	$1.2\ 10^{-3}$	$8.2\ 10^{-5}$	$2.5\ 10^{-4}$	$8.2\ 10^{-5}$	$2.2\ 10^{-2}$	$9.3\ 10^{-4}$	$1.4\ 10^{-3}$	-	-	-	$2.2\ 10^{-1}$	-	$2.6\ 10^{-1}$
^{14}C	$5.8\ 10^{-1}$	$9.8\ 10^{-1}$	$3.7\ 10^{-1}$	$2.5\ 10^{-2}$	$7.4\ 10^{-2}$	$2.5\ 10^{-2}$	$1.7\ 10^{0}$	$9.9\ 10^{-1}$	$2.5\ 10^{-1}$	$1.7\ 10^{-4}$	-	-	$8.1\ 10^{0}$	-	$1.3\ 10^{1}$
^{35}S	$1.3\ 10^{0}$	$8.5\ 10^{-1}$	$1.3\ 10^{1}$	$9.1\ 10^{-1}$	$6.5\ 10^{0}$	$8.7\ 10^{-1}$	$3.0\ 10^{1}$	$3.1\ 10^{1}$	$1.5\ 10^{-1}$	$5.4\ 10^{-4}$	-	-	$8.0\ 10^{0}$	$1.4\ 10^{-2}$	$9.3\ 10^{1}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$5.9\ 10^{-3}$	$1.0\ 10^{-1}$	-	-	-	$1.1\ 10^{-1}$
^{60}Co	$1.7\ 10^{0}$	$4.9\ 10^{-3}$	$6.2\ 10^{-2}$	$4.1\ 10^{-1}$	$2.0\ 10^{-2}$	$6.6\ 10^{-1}$	$2.7\ 10^{0}$	$2.8\ 10^{0}$	$5.9\ 10^{-2}$	$1.0\ 10^{-3}$	$2.0\ 10^{-1}$	$3.2\ 10^{2}$	$6.1\ 10^{1}$	$3.9\ 10^{-2}$	$3.9\ 10^{2}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$3.0\ 10^{-3}$	$1.8\ 10^{-4}$	-	-	-	$3.2\ 10^{-3}$
^{90}Sr	$1.4\ 10^{1}$	$1.3\ 10^{-1}$	$2.4\ 10^{-1}$	$1.6\ 10^{-2}$	$6.0\ 10^{-2}$	$2.0\ 10^{-2}$	$1.6\ 10^{1}$	$1.7\ 10^{1}$	$4.9\ 10^{-1}$	$2.3\ 10^{-3}$	-	$7.3\ 10^{-6}$	$2.2\ 10^{2}$	$1.4\ 10^{-1}$	$2.7\ 10^{2}$
^{106}Ru	$3.1\ 10^{0}$	$5.1\ 10^{-3}$	$8.3\ 10^{-2}$	$5.6\ 10^{-3}$	$2.7\ 10^{-2}$	$8.9\ 10^{-3}$	$2.7\ 10^{-3}$	$2.8\ 10^{-3}$	$5.9\ 10^{-2}$	$1.2\ 10^{-2}$	$9.9\ 10^{-3}$	$2.3\ 10^{1}$	$1.2\ 10^{2}$	$1.0\ 10^{-1}$	$1.5\ 10^{2}$
^{125}Sb	$5.3\ 10^{-1}$	$1.5\ 10^{-3}$	$3.0\ 10^{-2}$	$2.0\ 10^{-1}$	$1.2\ 10^{-2}$	$3.9\ 10^{-1}$	$4.3\ 10^{-2}$	$4.5\ 10^{-2}$	$1.9\ 10^{-2}$	$1.1\ 10^{-3}$	$3.3\ 10^{-2}$	$5.5\ 10^{1}$	$2.9\ 10^{1}$	$1.8\ 10^{-2}$	$8.5\ 10^{1}$
^{129}I	$4.1\ 10^{2}$	$3.3\ 10^{2}$	$7.0\ 10^{1}$	$4.6\ 10^{0}$	$4.0\ 10^{1}$	$1.3\ 10^{1}$	$1.4\ 10^{3}$	$1.5\ 10^{3}$	$4.9\ 10^{1}$	$1.2\ 10^{-4}$	$1.6\ 10^{-3}$	$7.6\ 10^{0}$	$1.8\ 10^{2}$	$1.1\ 10^{0}$	$4.0\ 10^{3}$
^{131}I	$2.6\ 10^{1}$	$4.6\ 10^{0}$	$2.8\ 10^{0}$	$2.2\ 10^{-1}$	$8.5\ 10^{-1}$	$2.8\ 10^{-1}$	$1.1\ 10^{2}$	$9.6\ 10^{1}$	$4.1\ 10^{0}$	$2.2\ 10^{-3}$	$2.7\ 10^{-2}$	$2.7\ 10^{1}$	$3.8\ 10^{1}$	$7.7\ 10^{-2}$	$3.1\ 10^{2}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$1.3\ 10^{-3}$	$4.7\ 10^{-3}$	-	-	-	$6.0\ 10^{-3}$
^{137}Cs	$7.6\ 10^{0}$	$6.0\ 10^{0}$	$9.6\ 10^{0}$	$6.4\ 10^{-1}$	$3.6\ 10^{0}$	$1.2\ 10^{0}$	$2.7\ 10^{1}$	$2.8\ 10^{1}$	$9.0\ 10^{-1}$	$3.1\ 10^{-3}$	$7.8\ 10^{-3}$	$8.2\ 10^{1}$	$2.8\ 10^{1}$	$1.8\ 10^{-2}$	$2.0\ 10^{2}$
^{239}Pu	$1.2\ 10^{2}$	$1.0\ 10^{-3}$	$2.1\ 10^{-1}$	$1.7\ 10^{0}$	$8.3\ 10^{-2}$	$2.0\ 10^{0}$	$5.3\ 10^{-2}$	$5.6\ 10^{-2}$	$2.2\ 10^{0}$	$6.6\ 10^{-5}$	$1.9\ 10^{-5}$	$1.0\ 10^{-2}$	$3.0\ 10^{5}$	$2.0\ 10^{2}$	$3.0\ 10^{5}$
^{241}Pu	$2.2\ 10^{0}$	$1.9\ 10^{-5}$	$3.9\ 10^{-3}$	$3.2\ 10^{-2}$	$1.6\ 10^{-3}$	$3.7\ 10^{-2}$	$1.0\ 10^{-3}$	$1.0\ 10^{-3}$	$4.2\ 10^{-2}$	$2.8\ 10^{-9}$	$1.9\ 10^{-7}$	$1.3\ 10^{-3}$	$5.5\ 10^{3}$	$3.6\ 10^{0}$	$5.5\ 10^{3}$
^{241}Am	$9.3\ 10^{1}$	$1.3\ 10^{-3}$	$1.7\ 10^{-1}$	$1.4\ 10^{0}$	$6.7\ 10^{-2}$	$1.6\ 10^{0}$	$4.4\ 10^{-2}$	$4.6\ 10^{-2}$	$1.7\ 10^{0}$	$2.4\ 10^{-6}$	$2.7\ 10^{-3}$	$2.1\ 10^{0}$	$2.6\ 10^{5}$	$1.7\ 10^{2}$	$2.6\ 10^{5}$
^{242}Cm	$5.1\ 10^{0}$	$2.3\ 10^{-5}$	$5.4\ 10^{-3}$	$4.4\ 10^{-2}$	$2.3\ 10^{-3}$	$5.4\ 10^{-2}$	$1.4\ 10^{-3}$	$1.5\ 10^{-3}$	$9.8\ 10^{-2}$	$7.6\ 10^{-11}$	$4.6\ 10^{-5}$	$9.9\ 10^{-3}$	$3.2\ 10^{4}$	$1.7\ 10^{1}$	$3.2\ 10^{4}$
^{244}Cm	$5.5\ 10^{1}$	$2.9\ 10^{-4}$	$9.9\ 10^{-2}$	$8.0\ 10^{-1}$	$3.9\ 10^{-2}$	$9.3\ 10^{-1}$	$2.5\ 10^{-2}$	$2.6\ 10^{-2}$	$1.0\ 10^{0}$	-	$5.6\ 10^{-5}$	$3.5\ 10^{-2}$	$1.6\ 10^{5}$	$1.1\ 10^{2}$	$1.6\ 10^{5}$

Table A14 Child annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 1a) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$1.1\ 10^{-1}$	$1.6\ 10^{-1}$	$1.4\ 10^{-2}$	$7.2\ 10^{-4}$	$3.3\ 10^{-3}$	$1.1\ 10^{-3}$	$3.6\ 10^{-1}$	-	$5.4\ 10^{-2}$	-	-	-	$1.5\ 10^{0}$	-	$2.2\ 10^{0}$
^{14}C	$2.8\ 10^{0}$	$4.2\ 10^{0}$	$4.9\ 10^{0}$	$2.4\ 10^{-1}$	$4.8\ 10^{-1}$	$1.4\ 10^{0}$	$2.8\ 10^{1}$	-	$1.4\ 10^{0}$	$2.0\ 10^{-3}$	-	-	$1.3\ 10^{2}$	-	$1.7\ 10^{2}$
^{35}S	$8.5\ 10^{0}$	$9.1\ 10^{0}$	$3.6\ 10^{0}$	$1.8\ 10^{-1}$	$5.9\ 10^{-1}$	$1.8\ 10^{0}$	$4.7\ 10^{1}$	-	$5.4\ 10^{0}$	$6.5\ 10^{-3}$	-	-	$1.3\ 10^{2}$	-	$2.1\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$7.0\ 10^{-2}$	$6.5\ 10^{-1}$	-	-	-	$7.2\ 10^{-1}$
^{60}Co	$2.6\ 10^{1}$	$5.0\ 10^{-1}$	$3.0\ 10^{0}$	$1.5\ 10^{1}$	$4.0\ 10^{-1}$	$1.3\ 10^{1}$	$2.5\ 10^{2}$	-	$7.6\ 10^{0}$	$1.2\ 10^{-2}$	$1.3\ 10^{0}$	$3.7\ 10^{3}$	$1.0\ 10^{3}$	-	$5.1\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$3.6\ 10^{-2}$	$1.3\ 10^{-3}$	-	-	-	$3.7\ 10^{-2}$
^{90}Sr	$1.7\ 10^{2}$	$8.5\ 10^{0}$	$7.2\ 10^{0}$	$3.6\ 10^{-1}$	$8.1\ 10^{-1}$	$2.7\ 10^{-1}$	$7.4\ 10^{2}$	-	$4.7\ 10^{1}$	$2.7\ 10^{-2}$	$3.4\ 10^{-11}$	$8.0\ 10^{-5}$	$3.5\ 10^{3}$	-	$4.5\ 10^{3}$
^{106}Ru	$3.3\ 10^{1}$	$2.6\ 10^{-1}$	$2.5\ 10^{0}$	$1.2\ 10^{-1}$	$3.5\ 10^{-1}$	$1.2\ 10^{-1}$	$1.5\ 10^{-1}$	-	$1.9\ 10^{0}$	$2.0\ 10^{-1}$	$8.7\ 10^{-2}$	$2.5\ 10^{2}$	$2.8\ 10^{3}$	$1.5\ 10^{0}$	$3.1\ 10^{3}$
^{125}Sb	$4.9\ 10^{0}$	$8.9\ 10^{-2}$	$1.0\ 10^{0}$	$5.1\ 10^{0}$	$1.4\ 10^{-1}$	$4.7\ 10^{0}$	$2.3\ 10^{0}$	-	$1.4\ 10^{0}$	$1.3\ 10^{-2}$	$2.5\ 10^{-1}$	$5.9\ 10^{2}$	$4.7\ 10^{2}$	-	$1.1\ 10^{3}$
^{129}I	$2.6\ 10^{3}$	$9.8\ 10^{3}$	$1.7\ 10^{3}$	$8.6\ 10^{1}$	$3.2\ 10^{2}$	$1.1\ 10^{2}$	$5.6\ 10^{4}$	-	$1.3\ 10^{4}$	$1.5\ 10^{-3}$	$1.2\ 10^{-2}$	$7.9\ 10^{1}$	$4.0\ 10^{3}$	-	$8.7\ 10^{4}$
^{131}I	$2.3\ 10^{2}$	$7.6\ 10^{1}$	$3.8\ 10^{1}$	$2.2\ 10^{0}$	$8.6\ 10^{0}$	$2.9\ 10^{0}$	$2.5\ 10^{3}$	-	$2.8\ 10^{2}$	$2.7\ 10^{-2}$	$2.0\ 10^{-1}$	$1.5\ 10^{2}$	$1.1\ 10^{3}$	-	$4.4\ 10^{3}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$1.5\ 10^{-2}$	$3.3\ 10^{-2}$	-	-	-	$4.8\ 10^{-2}$
^{137}Cs	$2.8\ 10^{1}$	$1.1\ 10^{2}$	$1.4\ 10^{2}$	$6.8\ 10^{0}$	$1.7\ 10^{1}$	$5.7\ 10^{0}$	$6.0\ 10^{2}$	-	$1.4\ 10^{2}$	$3.8\ 10^{-2}$	$6.6\ 10^{-2}$	$9.2\ 10^{2}$	$2.6\ 10^{2}$	$1.4\ 10^{-1}$	$2.2\ 10^{3}$
^{239}Pu	$6.0\ 10^{2}$	$3.2\ 10^{-2}$	$3.3\ 10^{0}$	$2.0\ 10^{1}$	$5.6\ 10^{-1}$	$1.3\ 10^{1}$	$1.3\ 10^{0}$	-	$3.4\ 10^{1}$	$7.9\ 10^{-4}$	$1.4\ 10^{-4}$	$1.2\ 10^{-1}$	$3.3\ 10^{6}$	$1.9\ 10^{3}$	$3.3\ 10^{6}$
^{241}Pu	$1.1\ 10^{1}$	$6.0\ 10^{-4}$	$6.0\ 10^{-2}$	$3.6\ 10^{-1}$	$1.0\ 10^{-2}$	$2.4\ 10^{-1}$	$2.4\ 10^{-2}$	-	$6.3\ 10^{-1}$	$3.3\ 10^{-8}$	$1.3\ 10^{-6}$	$2.1\ 10^{-2}$	$5.7\ 10^{4}$	$3.2\ 10^{1}$	$5.7\ 10^{4}$
^{241}Am	$4.9\ 10^{2}$	$4.2\ 10^{-2}$	$2.7\ 10^{0}$	$1.6\ 10^{1}$	$4.6\ 10^{-1}$	$1.1\ 10^{1}$	$1.1\ 10^{0}$	-	$2.7\ 10^{1}$	$2.9\ 10^{-5}$	$2.0\ 10^{-2}$	$2.4\ 10^{1}$	$2.8\ 10^{6}$	$1.5\ 10^{3}$	$2.8\ 10^{6}$
^{242}Cm	$5.0\ 10^{1}$	$8.6\ 10^{-4}$	$1.3\ 10^{-1}$	$7.9\ 10^{-1}$	$2.9\ 10^{-2}$	$6.6\ 10^{-1}$	$5.3\ 10^{-2}$	-	$2.8\ 10^{0}$	$9.1\ 10^{-10}$	$3.4\ 10^{-4}$	-	$5.0\ 10^{5}$	$2.4\ 10^{2}$	$5.0\ 10^{5}$
^{244}Cm	$3.1\ 10^{2}$	$9.9\ 10^{-3}$	$1.7\ 10^{0}$	$1.0\ 10^{1}$	$2.9\ 10^{-1}$	$6.7\ 10^{0}$	$6.7\ 10^{-1}$	-	$1.7\ 10^{1}$	-	$4.2\ 10^{-4}$	-	$2.1\ 10^{6}$	$1.2\ 10^{3}$	$2.1\ 10^{6}$

Table A15 Child annual doses per unit release (1 TBq) for a cautious (Cat D) short-term release assessment (scenario 1b) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	1.6 10^{0}	2.4 10^{0}	2.6 10^{-2}	1.3 10^{-3}	5.9 10^{-3}	2.0 10^{-3}	6.6 10^{-1}	2.0 10^{-2}	8.1 10^{-1}	-	-	-	2.0 10^{0}	-	7.5 10^{0}
^{14}C	4.5 10^{1}	7.5 10^{1}	1.8 10^{1}	8.9 10^{-1}	1.7 10^{0}	5.2 10^{0}	1.0 10^{2}	4.1 10^{1}	3.0 10^{1}	2.7 10^{-3}	-	-	1.7 10^{2}	-	4.9 10^{2}
^{35}S	4.7 10^{1}	3.9 10^{1}	1.3 10^{1}	6.5 10^{-1}	2.1 10^{0}	6.4 10^{0}	1.7 10^{2}	1.2 10^{2}	2.8 10^{1}	8.8 10^{-3}	-	-	1.8 10^{2}	-	6.0 10^{2}
^{41}Ar	-	-	-	-	-	-	-	-	-	9.4 10^{-2}	2.9 10^{0}	-	-	-	3.0 10^{0}
^{60}Co	2.1 10^{3}	2.5 10^{0}	1.4 10^{1}	7.0 10^{1}	1.8 10^{0}	6.1 10^{1}	1.2 10^{3}	8.8 10^{2}	5.5 10^{1}	1.7 10^{-2}	5.6 10^{0}	1.0 10^{4}	1.4 10^{3}	-	1.6 10^{4}
^{85}Kr	-	-	-	-	-	-	-	-	-	4.8 10^{-2}	4.9 10^{-3}	-	-	-	5.3 10^{-2}
^{90}Sr	1.2 10^{4}	4.2 10^{1}	3.3 10^{1}	1.7 10^{0}	3.7 10^{0}	1.3 10^{0}	3.4 10^{3}	2.6 10^{3}	3.3 10^{2}	3.7 10^{-2}	1.3 10^{-10}	2.2 10^{-4}	4.7 10^{3}	-	2.3 10^{4}
^{106}Ru	2.2 10^{3}	1.1 10^{0}	1.1 10^{1}	5.7 10^{-1}	1.6 10^{0}	5.4 10^{-1}	6.7 10^{-1}	5.0 10^{-1}	4.3 10^{1}	2.7 10^{-1}	3.1 10^{-1}	6.6 10^{2}	3.8 10^{3}	3.9 10^{0}	6.8 10^{3}
^{125}Sb	3.8 10^{2}	4.4 10^{-1}	4.7 10^{0}	2.4 10^{1}	6.5 10^{-1}	2.2 10^{1}	1.1 10^{1}	8.1 10^{0}	9.8 10^{0}	1.8 10^{-2}	9.3 10^{-1}	1.6 10^{3}	6.3 10^{2}	-	2.7 10^{3}
^{129}I	9.4 10^{4}	5.3 10^{4}	3.9 10^{3}	2.0 10^{2}	7.4 10^{2}	2.5 10^{2}	1.3 10^{5}	9.6 10^{4}	6.4 10^{4}	2.0 10^{-3}	4.5 10^{-2}	1.4 10^{2}	5.3 10^{3}	-	4.4 10^{5}
^{131}I	8.1 10^{2}	8.0 10^{1}	8.6 10^{1}	5.1 10^{0}	2.0 10^{1}	6.6 10^{0}	5.8 10^{3}	3.6 10^{3}	1.1 10^{2}	3.6 10^{-2}	7.7 10^{-1}	2.6 10^{2}	1.5 10^{3}	-	1.2 10^{4}
^{133}Xe	-	-	-	-	-	-	-	-	-	2.0 10^{-2}	1.3 10^{-1}	-	-	-	1.5 10^{-1}
^{137}Cs	2.0 10^{3}	1.2 10^{3}	6.3 10^{2}	3.1 10^{1}	7.9 10^{1}	2.6 10^{1}	2.8 10^{3}	6.4 10^{2}	1.4 10^{3}	5.1 10^{-2}	2.4 10^{-1}	2.5 10^{3}	3.4 10^{2}	3.8 10^{-1}	1.2 10^{4}
^{239}Pu	5.6 10^{4}	1.5 10^{-1}	1.5 10^{1}	9.2 10^{1}	2.6 10^{0}	6.1 10^{1}	6.1 10^{0}	4.6 10^{0}	1.1 10^{3}	1.1 10^{-3}	5.4 10^{-4}	3.1 10^{-1}	4.4 10^{6}	5.0 10^{3}	4.5 10^{6}
^{241}Pu	1.0 10^{3}	2.8 10^{-3}	2.8 10^{-1}	1.7 10^{0}	4.8 10^{-2}	1.1 10^{0}	1.1 10^{-1}	8.4 10^{-2}	2.0 10^{1}	4.5 10^{-8}	5.3 10^{-6}	5.6 10^{-2}	7.7 10^{4}	8.6 10^{1}	7.8 10^{4}
^{241}Am	4.5 10^{4}	2.0 10^{-1}	1.2 10^{1}	7.5 10^{1}	2.1 10^{0}	5.0 10^{1}	4.9 10^{0}	3.7 10^{0}	8.6 10^{2}	3.9 10^{-5}	7.5 10^{-2}	6.5 10^{1}	3.7 10^{6}	4.2 10^{3}	3.8 10^{6}
^{242}Cm	2.5 10^{3}	3.4 10^{-3}	6.0 10^{-1}	3.6 10^{0}	1.3 10^{-1}	3.1 10^{0}	2.5 10^{-1}	1.8 10^{-1}	4.8 10^{1}	1.2 10^{-9}	1.3 10^{-3}	-	6.8 10^{5}	6.4 10^{2}	6.8 10^{5}
^{244}Cm	2.8 10^{4}	4.6 10^{-2}	7.7 10^{0}	4.7 10^{1}	1.3 10^{0}	3.1 10^{1}	3.1 10^{0}	2.3 10^{0}	5.4 10^{2}	-	1.5 10^{-3}	-	2.9 10^{6}	3.2 10^{3}	2.9 10^{6}

Table A16 Child annual doses per unit release (1 TBq) for a cautious (Cat F) short-term release assessment (scenario 1c) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$5.6\ 10^{0}$	$8.4\ 10^{0}$	$9.0\ 10^{-2}$	$4.5\ 10^{-3}$	$2.0\ 10^{-2}$	$6.8\ 10^{-3}$	$2.3\ 10^{0}$	$6.8\ 10^{-2}$	$2.8\ 10^{0}$	-	-	-	$6.0\ 10^{0}$	-	$2.5\ 10^{1}$
^{14}C	$2.0\ 10^{2}$	$3.4\ 10^{2}$	$8.0\ 10^{1}$	$4.0\ 10^{0}$	$7.8\ 10^{0}$	$2.4\ 10^{1}$	$4.5\ 10^{2}$	$1.8\ 10^{2}$	$1.4\ 10^{2}$	$9.5\ 10^{-3}$	-	-	$6.0\ 10^{2}$	-	$2.0\ 10^{3}$
^{35}S	$1.7\ 10^{2}$	$1.5\ 10^{2}$	$4.8\ 10^{1}$	$2.4\ 10^{0}$	$7.8\ 10^{0}$	$2.4\ 10^{1}$	$6.2\ 10^{2}$	$4.6\ 10^{2}$	$1.0\ 10^{2}$	$2.7\ 10^{-2}$	-	-	$5.4\ 10^{2}$	-	$2.1\ 10^{3}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$3.3\ 10^{-1}$	$7.7\ 10^{0}$	-	-	-	$8.0\ 10^{0}$
^{60}Co	$1.9\ 10^{3}$	$2.3\ 10^{0}$	$1.3\ 10^{1}$	$6.4\ 10^{1}$	$1.7\ 10^{0}$	$5.5\ 10^{1}$	$1.1\ 10^{3}$	$7.9\ 10^{2}$	$5.0\ 10^{1}$	$5.6\ 10^{-2}$	$1.5\ 10^{1}$	$1.6\ 10^{4}$	$4.7\ 10^{3}$	-	$2.5\ 10^{4}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$1.7\ 10^{-1}$	$1.3\ 10^{-2}$	-	-	-	$1.8\ 10^{-1}$
^{90}Sr	$1.1\ 10^{4}$	$3.8\ 10^{1}$	$3.0\ 10^{1}$	$1.5\ 10^{0}$	$3.4\ 10^{0}$	$1.1\ 10^{0}$	$3.1\ 10^{3}$	$2.3\ 10^{3}$	$3.0\ 10^{2}$	$1.3\ 10^{-1}$	$8.5\ 10^{-10}$	$3.5\ 10^{-4}$	$1.6\ 10^{4}$	-	$3.3\ 10^{4}$
^{106}Ru	$2.0\ 10^{3}$	$9.8\ 10^{-1}$	$1.0\ 10^{1}$	$5.1\ 10^{-1}$	$1.5\ 10^{0}$	$4.9\ 10^{-1}$	$6.1\ 10^{-1}$	$4.5\ 10^{-1}$	$3.9\ 10^{1}$	$9.1\ 10^{-1}$	$1.1\ 10^{0}$	$1.1\ 10^{3}$	$1.3\ 10^{4}$	$6.3\ 10^{0}$	$1.6\ 10^{4}$
^{125}Sb	$3.5\ 10^{2}$	$4.0\ 10^{-1}$	$4.3\ 10^{0}$	$2.1\ 10^{1}$	$5.9\ 10^{-1}$	$2.0\ 10^{1}$	$9.8\ 10^{0}$	$7.3\ 10^{0}$	$8.9\ 10^{0}$	$6.1\ 10^{-2}$	$2.4\ 10^{0}$	$2.5\ 10^{3}$	$2.2\ 10^{3}$	-	$5.1\ 10^{3}$
^{129}I	$1.9\ 10^{5}$	$1.1\ 10^{5}$	$8.0\ 10^{3}$	$4.0\ 10^{2}$	$1.5\ 10^{3}$	$5.0\ 10^{2}$	$2.6\ 10^{5}$	$2.0\ 10^{5}$	$1.3\ 10^{5}$	$5.2\ 10^{-3}$	$1.1\ 10^{-1}$	$3.2\ 10^{2}$	$1.4\ 10^{4}$	-	$9.1\ 10^{5}$
^{131}I	$1.7\ 10^{3}$	$1.6\ 10^{2}$	$1.8\ 10^{2}$	$1.0\ 10^{1}$	$4.0\ 10^{1}$	$1.3\ 10^{1}$	$1.2\ 10^{4}$	$7.4\ 10^{3}$	$2.3\ 10^{2}$	$9.4\ 10^{-2}$	$1.7\ 10^{0}$	$6.0\ 10^{2}$	$3.9\ 10^{3}$	-	$2.6\ 10^{4}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$7.1\ 10^{-2}$	$3.5\ 10^{-1}$	-	-	-	$4.2\ 10^{-1}$
^{137}Cs	$1.8\ 10^{3}$	$1.0\ 10^{3}$	$5.7\ 10^{2}$	$2.8\ 10^{1}$	$7.2\ 10^{1}$	$2.4\ 10^{1}$	$2.5\ 10^{3}$	$5.8\ 10^{2}$	$1.3\ 10^{3}$	$1.7\ 10^{-1}$	$1.2\ 10^{0}$	$4.0\ 10^{3}$	$1.2\ 10^{3}$	$6.1\ 10^{-1}$	$1.3\ 10^{4}$
^{239}Pu	$5.0\ 10^{4}$	$1.4\ 10^{-1}$	$1.4\ 10^{1}$	$8.3\ 10^{1}$	$2.3\ 10^{0}$	$5.5\ 10^{1}$	$5.5\ 10^{0}$	$4.1\ 10^{0}$	$9.6\ 10^{2}$	$3.6\ 10^{-3}$	$1.6\ 10^{-3}$	$5.0\ 10^{-1}$	$1.5\ 10^{7}$	$8.0\ 10^{3}$	$1.5\ 10^{7}$
^{241}Pu	$9.3\ 10^{2}$	$2.5\ 10^{-3}$	$2.5\ 10^{-1}$	$1.5\ 10^{0}$	$4.3\ 10^{-2}$	$1.0\ 10^{0}$	$1.0\ 10^{-1}$	$7.6\ 10^{-2}$	$1.8\ 10^{1}$	$1.5\ 10^{-7}$	$1.4\ 10^{-5}$	$8.9\ 10^{-2}$	$2.6\ 10^{5}$	$1.4\ 10^{2}$	$2.6\ 10^{5}$
^{241}Am	$4.1\ 10^{4}$	$1.8\ 10^{-1}$	$1.1\ 10^{1}$	$6.8\ 10^{1}$	$1.9\ 10^{0}$	$4.5\ 10^{1}$	$4.5\ 10^{0}$	$3.4\ 10^{0}$	$7.8\ 10^{2}$	$1.3\ 10^{-4}$	$2.0\ 10^{-1}$	$1.1\ 10^{2}$	$1.3\ 10^{7}$	$6.7\ 10^{3}$	$1.3\ 10^{7}$
^{242}Cm	$2.3\ 10^{3}$	$3.0\ 10^{-3}$	$5.5\ 10^{-1}$	$3.3\ 10^{0}$	$1.2\ 10^{-1}$	$2.8\ 10^{0}$	$2.2\ 10^{-1}$	$1.7\ 10^{-1}$	$4.3\ 10^{1}$	$4.2\ 10^{-9}$	$3.9\ 10^{-3}$	-	$2.3\ 10^{6}$	$1.0\ 10^{3}$	$2.3\ 10^{6}$
^{244}Cm	$2.6\ 10^{4}$	$4.2\ 10^{-2}$	$7.0\ 10^{0}$	$4.2\ 10^{1}$	$1.2\ 10^{0}$	$2.8\ 10^{1}$	$2.8\ 10^{0}$	$2.1\ 10^{0}$	$4.9\ 10^{2}$	-	$4.5\ 10^{-3}$	-	$9.8\ 10^{6}$	$5.1\ 10^{3}$	$9.8\ 10^{6}$

Table A17 Child annual doses per unit release (1 TBq y^{-1}) for a continuous release assessment (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	4.0 10^{-3}	6.0 10^{-3}	1.0 10^{-3}	5.2 10^{-5}	1.6 10^{-4}	5.2 10^{-5}	3.0 10^{-2}	8.9 10^{-4}	1.8 10^{-3}	-	-	-	2.0 10^{-1}	-	2.4 10^{-1}
^{14}C	3.4 10^{-1}	1.1 10^{0}	3.4 10^{-1}	1.7 10^{-2}	5.1 10^{-2}	1.7 10^{-2}	2.5 10^{0}	1.0 10^{0}	3.4 10^{-1}	1.7 10^{-4}	-	-	7.8 10^{0}	-	1.4 10^{1}
^{35}S	1.1 10^{0}	1.5 10^{0}	1.9 10^{1}	9.4 10^{-1}	6.8 10^{0}	9.1 10^{-1}	6.6 10^{1}	4.9 10^{1}	3.1 10^{-1}	5.4 10^{-4}	-	-	7.9 10^{0}	1.4 10^{-2}	1.5 10^{2}
^{41}Ar	-	-	-	-	-	-	-	-	-	5.9 10^{-3}	6.2 10^{-2}	-	-	-	6.8 10^{-2}
^{60}Co	2.3 10^{0}	1.3 10^{-2}	1.3 10^{-1}	6.7 10^{-1}	3.2 10^{-2}	1.1 10^{0}	9.1 10^{0}	6.8 10^{0}	1.9 10^{-1}	1.0 10^{-3}	1.2 10^{-1}	1.6 10^{2}	6.3 10^{1}	4.1 10^{-2}	2.4 10^{2}
^{85}Kr	-	-	-	-	-	-	-	-	-	3.0 10^{-3}	1.1 10^{-4}	-	-	-	3.1 10^{-3}
^{90}Sr	1.3 10^{1}	2.4 10^{-1}	3.5 10^{-1}	1.7 10^{-2}	6.5 10^{-2}	2.2 10^{-2}	3.6 10^{1}	2.7 10^{1}	1.0 10^{0}	2.3 10^{-3}	-	3.7 10^{-6}	2.2 10^{2}	1.4 10^{-1}	3.0 10^{2}
^{106}Ru	2.9 10^{0}	9.1 10^{-3}	1.2 10^{-1}	6.0 10^{-3}	2.8 10^{-2}	9.5 10^{-3}	6.0 10^{-3}	4.5 10^{-3}	1.3 10^{-1}	1.2 10^{-2}	6.0 10^{-3}	1.2 10^{1}	1.3 10^{2}	1.0 10^{-1}	1.5 10^{2}
^{125}Sb	4.4 10^{-1}	2.5 10^{-3}	3.8 10^{-2}	1.9 10^{-1}	1.1 10^{-2}	3.8 10^{-1}	8.6 10^{-2}	6.5 10^{-2}	3.6 10^{-2}	1.1 10^{-3}	2.0 10^{-2}	2.8 10^{1}	2.9 10^{1}	1.8 10^{-2}	5.8 10^{1}
^{129}I	3.1 10^{2}	4.8 10^{2}	8.0 10^{1}	4.0 10^{0}	3.4 10^{1}	1.1 10^{1}	2.6 10^{3}	2.0 10^{3}	8.4 10^{1}	1.2 10^{-4}	9.7 10^{-4}	3.9 10^{0}	2.4 10^{2}	1.5 10^{0}	5.9 10^{3}
^{131}I	2.6 10^{1}	9.2 10^{0}	4.4 10^{0}	2.6 10^{-1}	1.0 10^{0}	3.3 10^{-1}	2.7 10^{2}	1.7 10^{2}	9.7 10^{0}	2.2 10^{-3}	1.6 10^{-2}	1.3 10^{1}	6.7 10^{1}	1.4 10^{-1}	5.7 10^{2}
^{133}Xe	-	-	-	-	-	-	-	-	-	1.3 10^{-3}	2.8 10^{-3}	-	-	-	4.1 10^{-3}
^{137}Cs	2.5 10^{0}	3.9 10^{0}	4.9 10^{0}	2.5 10^{-1}	1.4 10^{0}	4.6 10^{-1}	2.1 10^{1}	1.6 10^{1}	6.9 10^{-1}	3.1 10^{-3}	4.7 10^{-3}	4.2 10^{1}	1.6 10^{1}	1.0 10^{-2}	1.1 10^{2}
^{239}Pu	5.4 10^{1}	9.2 10^{-4}	1.5 10^{-1}	9.1 10^{-1}	4.5 10^{-2}	1.1 10^{0}	6.0 10^{-2}	4.5 10^{-2}	2.3 10^{0}	6.6 10^{-5}	1.2 10^{-5}	5.2 10^{-3}	2.0 10^{5}	1.3 10^{2}	2.0 10^{5}
^{241}Pu	1.0 10^{0}	1.7 10^{-5}	2.8 10^{-3}	1.7 10^{-2}	8.3 10^{-4}	2.0 10^{-2}	1.1 10^{-3}	8.3 10^{-4}	4.4 10^{-2}	2.8 10^{-9}	1.1 10^{-7}	6.5 10^{-4}	3.5 10^{3}	2.3 10^{0}	3.5 10^{3}
^{241}Am	4.4 10^{1}	1.2 10^{-3}	1.3 10^{-1}	7.6 10^{-1}	3.7 10^{-2}	8.7 10^{-1}	5.0 10^{-2}	3.8 10^{-2}	1.9 10^{0}	2.4 10^{-6}	1.6 10^{-3}	1.1 10^{0}	1.7 10^{5}	1.1 10^{2}	1.7 10^{5}
^{242}Cm	4.4 10^{0}	3.8 10^{-5}	7.3 10^{-3}	4.4 10^{-2}	2.3 10^{-3}	5.4 10^{-2}	2.9 10^{-3}	2.2 10^{-3}	2.0 10^{-1}	7.6 10^{-11}	2.8 10^{-5}	5.1 10^{-3}	3.1 10^{4}	1.7 10^{1}	3.1 10^{4}
^{244}Cm	2.8 10^{1}	2.9 10^{-4}	7.7 10^{-2}	4.7 10^{-1}	2.3 10^{-2}	5.4 10^{-1}	3.1 10^{-2}	2.3 10^{-2}	1.2 10^{0}	-	3.4 10^{-5}	1.8 10^{-2}	1.1 10^{5}	7.5 10^{1}	1.1 10^{5}

Table A18 Infant annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 1a) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$1.1\ 10^{-1}$	$7.5\ 10^{-2}$	$9.0\ 10^{-3}$	$6.0\ 10^{-4}$	$2.7\ 10^{-3}$	$9.1\ 10^{-4}$	$1.0\ 10^{0}$	-	$5.6\ 10^{-2}$	-	-	-	$1.1\ 10^{0}$	-	$2.4\ 10^{0}$
^{14}C	$2.8\ 10^{0}$	$1.8\ 10^{0}$	$2.9\ 10^{0}$	$2.0\ 10^{-1}$	$3.8\ 10^{-1}$	$1.2\ 10^{0}$	$7.3\ 10^{1}$	-	$1.4\ 10^{0}$	$2.0\ 10^{-3}$	-	-	$1.0\ 10^{2}$	-	$1.9\ 10^{2}$
^{35}S	$1.4\ 10^{1}$	$6.8\ 10^{0}$	$3.6\ 10^{0}$	$2.5\ 10^{-1}$	$8.0\ 10^{-1}$	$2.4\ 10^{0}$	$2.1\ 10^{2}$	-	$9.1\ 10^{0}$	$6.5\ 10^{-3}$	-	-	$1.1\ 10^{2}$	-	$3.5\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$7.0\ 10^{-2}$	$5.1\ 10^{-1}$	-	-	-	$5.8\ 10^{-1}$
^{60}Co	$3.2\ 10^{1}$	$2.7\ 10^{-1}$	$2.2\ 10^{0}$	$1.5\ 10^{1}$	$3.9\ 10^{-1}$	$1.3\ 10^{1}$	$8.2\ 10^{2}$	-	$9.4\ 10^{0}$	$1.2\ 10^{-2}$	$9.9\ 10^{-1}$	$3.0\ 10^{3}$	$8.3\ 10^{2}$	-	$4.7\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$3.6\ 10^{-2}$	$1.0\ 10^{-3}$	-	-	-	$3.7\ 10^{-2}$
^{90}Sr	$1.0\ 10^{2}$	$2.3\ 10^{0}$	$2.6\ 10^{0}$	$1.8\ 10^{-1}$	$3.9\ 10^{-1}$	$1.3\ 10^{-1}$	$1.2\ 10^{3}$	-	$2.8\ 10^{1}$	$2.7\ 10^{-2}$	$2.6\ 10^{-11}$	$6.4\ 10^{-5}$	$2.7\ 10^{3}$	-	$4.0\ 10^{3}$
^{106}Ru	$5.3\ 10^{1}$	$1.9\ 10^{-1}$	$2.4\ 10^{0}$	$1.6\ 10^{-1}$	$4.6\ 10^{-1}$	$1.5\ 10^{-1}$	$6.2\ 10^{-1}$	-	$3.1\ 10^{0}$	$2.0\ 10^{-1}$	$6.8\ 10^{-2}$	$2.0\ 10^{2}$	$2.7\ 10^{3}$	$1.6\ 10^{0}$	$3.0\ 10^{3}$
^{125}Sb	$7.1\ 10^{0}$	$5.8\ 10^{-2}$	$8.9\ 10^{-1}$	$6.0\ 10^{0}$	$1.6\ 10^{-1}$	$5.4\ 10^{0}$	$8.9\ 10^{0}$	-	$2.1\ 10^{0}$	$1.3\ 10^{-2}$	$1.9\ 10^{-1}$	$4.7\ 10^{2}$	$3.9\ 10^{2}$	-	$8.9\ 10^{2}$
^{129}I	$1.5\ 10^{3}$	$2.5\ 10^{3}$	$5.9\ 10^{2}$	$4.0\ 10^{1}$	$1.5\ 10^{2}$	$5.0\ 10^{1}$	$8.5\ 10^{4}$	-	$7.4\ 10^{3}$	$1.5\ 10^{-3}$	$9.5\ 10^{-3}$	$6.3\ 10^{1}$	$1.8\ 10^{3}$	-	$9.9\ 10^{4}$
^{131}I	$4.0\ 10^{2}$	$5.9\ 10^{1}$	$3.9\ 10^{1}$	$3.1\ 10^{0}$	$1.2\ 10^{1}$	$4.0\ 10^{0}$	$1.2\ 10^{4}$	-	$4.8\ 10^{2}$	$2.7\ 10^{-2}$	$1.6\ 10^{-1}$	$1.2\ 10^{2}$	$1.5\ 10^{3}$	-	$1.4\ 10^{4}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$1.5\ 10^{-2}$	$2.6\ 10^{-2}$	-	-	-	$4.1\ 10^{-2}$
^{137}Cs	$1.7\ 10^{1}$	$2.8\ 10^{1}$	$4.9\ 10^{1}$	$3.3\ 10^{0}$	$8.2\ 10^{0}$	$2.7\ 10^{0}$	$9.5\ 10^{2}$	-	$8.3\ 10^{1}$	$3.8\ 10^{-2}$	$5.2\ 10^{-2}$	$7.3\ 10^{2}$	$1.3\ 10^{2}$	$8.4\ 10^{-2}$	$2.0\ 10^{3}$
^{239}Pu	$4.7\ 10^{2}$	$1.1\ 10^{-2}$	$1.5\ 10^{0}$	$1.2\ 10^{1}$	$3.5\ 10^{-1}$	$8.2\ 10^{0}$	$2.7\ 10^{0}$	-	$2.6\ 10^{1}$	$7.9\ 10^{-4}$	$1.1\ 10^{-4}$	$9.3\ 10^{-2}$	$1.9\ 10^{6}$	$1.2\ 10^{3}$	$1.9\ 10^{6}$
^{241}Pu	$6.3\ 10^{0}$	$1.5\ 10^{-4}$	$2.0\ 10^{-2}$	$1.6\ 10^{-1}$	$4.6\ 10^{-3}$	$1.1\ 10^{-1}$	$3.6\ 10^{-2}$	-	$3.5\ 10^{-1}$	$3.3\ 10^{-8}$	$1.0\ 10^{-6}$	$1.7\ 10^{-2}$	$2.4\ 10^{4}$	$1.5\ 10^{1}$	$2.4\ 10^{4}$
^{241}Am	$4.1\ 10^{2}$	$1.6\ 10^{-2}$	$1.4\ 10^{0}$	$1.1\ 10^{1}$	$3.1\ 10^{-1}$	$7.2\ 10^{0}$	$2.4\ 10^{0}$	-	$2.3\ 10^{1}$	$2.9\ 10^{-5}$	$1.5\ 10^{-2}$	$1.9\ 10^{1}$	$1.7\ 10^{6}$	$1.1\ 10^{3}$	$1.7\ 10^{6}$
^{242}Cm	$7.9\ 10^{1}$	$6.1\ 10^{-4}$	$1.2\ 10^{-1}$	$1.0\ 10^{0}$	$3.6\ 10^{-2}$	$8.4\ 10^{-1}$	$2.2\ 10^{-1}$	-	$4.4\ 10^{0}$	$9.1\ 10^{-10}$	$2.7\ 10^{-4}$	-	$4.4\ 10^{5}$	$2.4\ 10^{2}$	$4.4\ 10^{5}$
^{244}Cm	$3.2\ 10^{2}$	$4.6\ 10^{-3}$	$1.0\ 10^{0}$	$8.3\ 10^{0}$	$2.4\ 10^{-1}$	$5.6\ 10^{0}$	$1.8\ 10^{0}$	-	$1.8\ 10^{1}$	-	$3.2\ 10^{-4}$	-	$1.5\ 10^{6}$	$9.5\ 10^{2}$	$1.5\ 10^{6}$

Table A19 Infant annual doses per unit release (1 TBq) for a cautious (Cat D) short-term release assessment (scenario 1b) (μSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	1.7 10^{0}	1.1 10^{0}	1.6 10^{-2}	1.1 10^{-3}	4.9 10^{-3}	1.6 10^{-3}	1.8 10^{0}	4.1 10^{-2}	8.4 10^{-1}	-	-	-	1.5 10^{0}	-	7.0 10^{0}
^{14}C	4.5 10^{1}	3.3 10^{1}	1.1 10^{1}	7.1 10^{-1}	1.4 10^{0}	4.2 10^{0}	2.6 10^{2}	8.2 10^{1}	3.0 10^{1}	2.7 10^{-3}	-	-	1.4 10^{2}	-	6.1 10^{2}
^{35}S	7.9 10^{1}	3.0 10^{1}	1.3 10^{1}	8.8 10^{-1}	2.9 10^{0}	8.6 10^{0}	7.5 10^{2}	4.2 10^{2}	4.7 10^{1}	8.8 10^{-3}	-	-	1.4 10^{2}	-	1.5 10^{3}
^{41}Ar	-	-	-	-	-	-	-	-	-	9.4 10^{-2}	2.9 10^{0}	-	-	-	3.0 10^{0}
^{60}Co	2.6 10^{3}	1.4 10^{0}	1.0 10^{1}	6.9 10^{1}	1.8 10^{0}	6.0 10^{1}	3.8 10^{3}	2.2 10^{3}	6.7 10^{1}	1.7 10^{-2}	5.6 10^{0}	6.8 10^{3}	1.1 10^{3}	-	1.7 10^{4}
^{85}Kr	-	-	-	-	-	-	-	-	-	4.8 10^{-2}	4.9 10^{-3}	-	-	-	5.3 10^{-2}
^{90}Sr	7.4 10^{3}	1.1 10^{1}	1.2 10^{1}	8.1 10^{-1}	1.8 10^{0}	6.1 10^{-1}	5.5 10^{3}	3.1 10^{3}	2.0 10^{2}	3.7 10^{-2}	1.3 10^{-10}	1.5 10^{-4}	3.6 10^{3}	-	2.0 10^{4}
^{106}Ru	3.7 10^{3}	7.9 10^{-1}	1.1 10^{1}	7.4 10^{-1}	2.1 10^{0}	7.1 10^{-1}	2.9 10^{0}	1.6 10^{0}	7.0 10^{1}	2.7 10^{-1}	3.1 10^{-1}	4.5 10^{2}	3.6 10^{3}	3.6 10^{0}	7.8 10^{3}
^{125}Sb	5.6 10^{2}	2.9 10^{-1}	4.1 10^{0}	2.8 10^{1}	7.5 10^{-1}	2.5 10^{1}	4.1 10^{1}	2.3 10^{1}	1.4 10^{1}	1.8 10^{-2}	9.3 10^{-1}	1.1 10^{3}	5.3 10^{2}	-	2.3 10^{3}
^{129}I	5.4 10^{4}	1.4 10^{4}	1.4 10^{3}	9.1 10^{1}	3.4 10^{2}	1.1 10^{2}	2.0 10^{5}	1.1 10^{5}	3.7 10^{4}	2.0 10^{-3}	4.5 10^{-2}	9.2 10^{1}	2.4 10^{3}	-	4.2 10^{5}
^{131}I	1.4 10^{3}	6.2 10^{1}	8.9 10^{1}	7.1 10^{0}	2.7 10^{1}	9.1 10^{0}	2.6 10^{4}	1.3 10^{4}	2.0 10^{2}	3.6 10^{-2}	7.7 10^{-1}	1.7 10^{2}	2.0 10^{3}	-	4.3 10^{4}
^{133}Xe	-	-	-	-	-	-	-	-	-	2.0 10^{-2}	1.3 10^{-1}	-	-	-	1.5 10^{-1}
^{137}Cs	1.2 10^{3}	3.1 10^{2}	2.3 10^{2}	1.5 10^{1}	3.8 10^{1}	1.3 10^{1}	4.4 10^{3}	7.7 10^{2}	8.3 10^{2}	5.1 10^{-2}	2.4 10^{-1}	1.7 10^{3}	1.8 10^{2}	1.9 10^{-1}	9.7 10^{3}
^{239}Pu	4.3 10^{4}	5.3 10^{-2}	7.1 10^{0}	5.7 10^{1}	1.6 10^{0}	3.8 10^{1}	1.2 10^{1}	7.1 10^{0}	8.3 10^{2}	1.1 10^{-3}	5.4 10^{-4}	2.1 10^{-1}	2.5 10^{6}	2.8 10^{3}	2.6 10^{6}
^{241}Pu	5.7 10^{2}	6.9 10^{-4}	9.3 10^{-2}	7.5 10^{-1}	2.1 10^{-2}	5.0 10^{-1}	1.6 10^{-1}	9.3 10^{-2}	1.1 10^{1}	4.5 10^{-8}	5.3 10^{-6}	3.8 10^{-2}	3.2 10^{4}	3.4 10^{1}	3.3 10^{4}
^{241}Am	3.8 10^{4}	7.5 10^{-2}	6.2 10^{0}	5.0 10^{1}	1.4 10^{0}	3.3 10^{1}	1.1 10^{1}	6.2 10^{0}	7.3 10^{2}	3.9 10^{-5}	7.5 10^{-2}	4.4 10^{1}	2.3 10^{6}	2.5 10^{3}	2.3 10^{6}
^{242}Cm	4.0 10^{3}	2.4 10^{-3}	5.7 10^{-1}	4.6 10^{0}	1.7 10^{-1}	3.9 10^{0}	1.0 10^{0}	5.8 10^{-1}	7.6 10^{1}	1.2 10^{-9}	1.3 10^{-3}	-	5.9 10^{5}	5.4 10^{2}	6.0 10^{5}
^{244}Cm	2.9 10^{4}	2.1 10^{-2}	4.8 10^{0}	3.9 10^{1}	1.1 10^{0}	2.6 10^{1}	8.4 10^{0}	4.8 10^{0}	5.6 10^{2}	-	1.5 10^{-3}	-	2.0 10^{6}	2.2 10^{3}	2.0 10^{6}

Table A20 Infant annual doses per unit release (1 TBq) for a cautious (Cat F) short-term release assessment (scenario 1c) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	5.8 10^{0}	3.9 10^{0}	5.6 10^{-2}	3.8 10^{-3}	1.7 10^{-2}	5.7 10^{-3}	6.3 10^{0}	1.4 10^{-1}	2.9 10^{0}	-	-	-	4.4 10^{0}	-	2.4 10^{1}
^{14}C	2.0 10^{2}	1.5 10^{2}	4.8 10^{1}	3.2 10^{0}	6.3 10^{0}	1.9 10^{1}	1.2 10^{3}	3.7 10^{2}	1.4 10^{2}	9.5 10^{-3}	-	-	4.9 10^{2}	-	2.6 10^{3}
^{35}S	2.9 10^{2}	1.1 10^{2}	4.8 10^{1}	3.3 10^{0}	1.1 10^{1}	3.2 10^{1}	2.8 10^{3}	1.5 10^{3}	1.7 10^{2}	2.7 10^{-2}	-	-	4.4 10^{2}	-	5.4 10^{3}
^{41}Ar	-	-	-	-	-	-	-	-	-	3.3 10^{-1}	7.7 10^{0}	-	-	-	8.0 10^{0}
^{60}Co	2.4 10^{3}	1.3 10^{0}	9.4 10^{0}	6.2 10^{1}	1.6 10^{0}	5.4 10^{1}	3.4 10^{3}	2.0 10^{3}	6.1 10^{1}	5.6 10^{-2}	1.5 10^{1}	1.1 10^{4}	3.8 10^{3}	-	2.3 10^{4}
^{85}Kr	-	-	-	-	-	-	-	-	-	1.7 10^{-1}	1.3 10^{-2}	-	-	-	1.8 10^{-1}
^{90}Sr	6.7 10^{3}	1.0 10^{1}	1.1 10^{1}	7.3 10^{-1}	1.7 10^{0}	5.5 10^{-1}	5.0 10^{3}	2.8 10^{3}	1.8 10^{2}	1.3 10^{-1}	8.5 10^{-10}	2.3 10^{-4}	1.2 10^{4}	-	2.7 10^{4}
^{106}Ru	3.3 10^{3}	7.1 10^{-1}	1.0 10^{1}	6.7 10^{-1}	1.9 10^{0}	6.4 10^{-1}	2.6 10^{0}	1.5 10^{0}	6.3 10^{1}	9.1 10^{-1}	1.1 10^{0}	7.2 10^{2}	1.2 10^{4}	5.8 10^{0}	1.7 10^{4}
^{125}Sb	5.0 10^{2}	2.6 10^{-1}	3.7 10^{0}	2.5 10^{1}	6.8 10^{-1}	2.3 10^{1}	3.7 10^{1}	2.1 10^{1}	1.3 10^{1}	6.1 10^{-2}	2.4 10^{0}	1.7 10^{3}	1.8 10^{3}	-	4.2 10^{3}
^{129}I	1.1 10^{5}	2.8 10^{4}	2.8 10^{3}	1.9 10^{2}	7.0 10^{2}	2.3 10^{2}	4.0 10^{5}	2.3 10^{5}	7.5 10^{4}	5.2 10^{-3}	1.1 10^{-1}	2.2 10^{2}	6.4 10^{3}	-	8.5 10^{5}
^{131}I	2.9 10^{3}	1.3 10^{2}	1.8 10^{2}	1.5 10^{1}	5.6 10^{1}	1.9 10^{1}	5.4 10^{4}	2.6 10^{4}	4.0 10^{2}	9.4 10^{-2}	1.7 10^{0}	4.1 10^{2}	5.3 10^{3}	-	8.9 10^{4}
^{133}Xe	-	-	-	-	-	-	-	-	-	7.1 10^{-2}	3.5 10^{-1}	-	-	-	4.2 10^{-1}
^{137}Cs	1.1 10^{3}	2.8 10^{2}	2.1 10^{2}	1.4 10^{1}	3.4 10^{1}	1.1 10^{1}	4.0 10^{3}	7.0 10^{2}	7.5 10^{2}	1.7 10^{-1}	1.2 10^{0}	2.7 10^{3}	6.1 10^{2}	3.1 10^{-1}	1.0 10^{4}
^{239}Pu	3.9 10^{4}	4.8 10^{-2}	6.4 10^{0}	5.2 10^{1}	1.5 10^{0}	3.4 10^{1}	1.1 10^{1}	6.4 10^{0}	7.5 10^{2}	3.6 10^{-3}	1.6 10^{-3}	3.4 10^{-1}	8.7 10^{6}	4.4 10^{3}	8.7 10^{6}
^{241}Pu	5.2 10^{2}	6.3 10^{-4}	8.5 10^{-2}	6.8 10^{-1}	1.9 10^{-2}	4.6 10^{-1}	1.5 10^{-1}	8.5 10^{-2}	9.9 10^{0}	1.5 10^{-7}	1.4 10^{-5}	6.0 10^{-2}	1.1 10^{5}	5.5 10^{1}	1.1 10^{5}
^{241}Am	3.5 10^{4}	6.8 10^{-2}	5.6 10^{0}	4.6 10^{1}	1.3 10^{0}	3.0 10^{1}	9.9 10^{0}	5.7 10^{0}	6.6 10^{2}	1.3 10^{-4}	2.0 10^{-1}	7.1 10^{1}	7.8 10^{6}	4.0 10^{3}	7.8 10^{6}
^{242}Cm	3.6 10^{3}	2.1 10^{-3}	5.2 10^{-1}	4.2 10^{0}	1.5 10^{-1}	3.5 10^{0}	9.3 10^{-1}	5.2 10^{-1}	6.9 10^{1}	4.2 10^{-9}	3.9 10^{-3}	-	2.0 10^{6}	8.7 10^{2}	2.0 10^{6}
^{244}Cm	2.7 10^{4}	1.9 10^{-2}	4.3 10^{0}	3.5 10^{1}	9.9 10^{-1}	2.3 10^{1}	7.6 10^{0}	4.3 10^{0}	5.1 10^{2}	-	4.5 10^{-3}	-	6.9 10^{6}	3.5 10^{3}	6.9 10^{6}

Table A21 Infant annual doses per unit release (1 TBq y^{-1}) for a continuous release assessment (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	4.2 10^{-3}	3.6 10^{-3}	6.6 10^{-4}	4.4 10^{-5}	1.3 10^{-4}	4.4 10^{-5}	8.2 10^{-2}	1.9 10^{-3}	1.9 10^{-3}	-	-	-	1.4 10^{-1}	-	2.3 10^{-1}
^{14}C	3.4 10^{-1}	6.6 10^{-1}	2.0 10^{-1}	1.4 10^{-2}	4.1 10^{-2}	1.4 10^{-2}	6.6 10^{0}	2.0 10^{0}	3.4 10^{-1}	1.7 10^{-4}	-	-	6.1 10^{0}	-	1.6 10^{1}
^{35}S	1.9 10^{0}	1.4 10^{0}	1.9 10^{1}	1.3 10^{0}	9.2 10^{0}	1.2 10^{0}	2.9 10^{2}	1.7 10^{2}	5.2 10^{-1}	5.4 10^{-4}	-	-	6.1 10^{0}	1.1 10^{-2}	5.0 10^{2}
^{41}Ar	-	-	-	-	-	-	-	-	-	5.9 10^{-3}	4.9 10^{-2}	-	-	-	5.5 10^{-2}
^{60}Co	2.8 10^{0}	9.4 10^{-3}	9.8 10^{-2}	6.6 10^{-1}	3.1 10^{-2}	1.0 10^{0}	2.9 10^{1}	1.7 10^{1}	2.3 10^{-1}	1.0 10^{-3}	9.2 10^{-2}	1.1 10^{2}	4.9 10^{1}	3.2 10^{-2}	2.1 10^{2}
^{85}Kr	-	-	-	-	-	-	-	-	-	3.0 10^{-3}	8.2 10^{-5}	-	-	-	3.1 10^{-3}
^{90}Sr	8.1 10^{0}	8.3 10^{-2}	1.3 10^{-1}	8.5 10^{-3}	3.2 10^{-2}	1.1 10^{-2}	5.8 10^{1}	3.3 10^{1}	6.3 10^{-1}	2.3 10^{-3}	-	2.5 10^{-6}	1.6 10^{2}	1.0 10^{-1}	2.6 10^{2}
^{106}Ru	4.7 10^{0}	8.6 10^{-3}	1.2 10^{-1}	7.9 10^{-3}	3.7 10^{-2}	1.2 10^{-2}	2.6 10^{-2}	1.5 10^{-2}	2.1 10^{-1}	1.2 10^{-2}	4.6 10^{-3}	8.0 10^{0}	1.2 10^{2}	9.5 10^{-2}	1.3 10^{2}
^{125}Sb	6.4 10^{-1}	2.1 10^{-3}	3.3 10^{-2}	2.2 10^{-1}	1.3 10^{-2}	4.4 10^{-1}	3.3 10^{-1}	1.9 10^{-1}	5.2 10^{-2}	1.1 10^{-3}	1.5 10^{-2}	1.9 10^{1}	2.3 10^{1}	1.5 10^{-2}	4.4 10^{1}
^{129}I	1.8 10^{2}	1.6 10^{2}	2.8 10^{1}	1.9 10^{0}	1.6 10^{1}	5.3 10^{0}	4.0 10^{3}	2.3 10^{3}	4.9 10^{1}	1.2 10^{-4}	7.5 10^{-4}	2.6 10^{0}	1.0 10^{2}	6.5 10^{-1}	6.8 10^{3}
^{131}I	4.5 10^{1}	9.1 10^{0}	4.5 10^{0}	3.6 10^{-1}	1.4 10^{0}	4.6 10^{-1}	1.2 10^{3}	5.9 10^{2}	1.7 10^{1}	2.2 10^{-3}	1.3 10^{-2}	9.2 10^{0}	8.8 10^{1}	1.8 10^{-1}	2.0 10^{3}
^{133}Xe	-	-	-	-	-	-	-	-	-	1.3 10^{-3}	2.2 10^{-3}	-	-	-	3.5 10^{-3}
^{137}Cs	1.5 10^{0}	1.3 10^{0}	1.8 10^{0}	1.2 10^{-1}	6.6 10^{-1}	2.2 10^{-1}	3.4 10^{1}	1.9 10^{1}	4.2 10^{-1}	3.1 10^{-3}	3.6 10^{-3}	2.8 10^{1}	7.9 10^{0}	5.1 10^{-3}	9.5 10^{1}
^{239}Pu	4.2 10^{1}	4.1 10^{-4}	7.1 10^{-2}	5.7 10^{-1}	2.8 10^{-2}	6.6 10^{-1}	1.2 10^{-1}	7.1 10^{-2}	1.8 10^{0}	6.6 10^{-5}	9.1 10^{-6}	3.5 10^{-3}	1.1 10^{5}	7.4 10^{1}	1.1 10^{5}
^{241}Pu	5.6 10^{-1}	5.6 10^{-6}	9.4 10^{-4}	7.6 10^{-3}	3.7 10^{-4}	8.8 10^{-3}	1.6 10^{-3}	9.3 10^{-4}	2.5 10^{-2}	2.8 10^{-9}	8.8 10^{-8}	4.4 10^{-4}	1.4 10^{3}	9.2 10^{-1}	1.4 10^{3}
^{241}Am	3.7 10^{1}	5.8 10^{-4}	6.4 10^{-2}	5.1 10^{-1}	2.5 10^{-2}	5.8 10^{-1}	1.1 10^{-1}	6.4 10^{-2}	1.6 10^{0}	2.4 10^{-6}	1.3 10^{-3}	7.3 10^{-1}	1.0 10^{5}	6.6 10^{1}	1.0 10^{5}
^{242}Cm	6.9 10^{0}	3.5 10^{-5}	6.9 10^{-3}	5.5 10^{-2}	2.9 10^{-3}	6.8 10^{-2}	1.2 10^{-2}	6.9 10^{-3}	3.1 10^{-1}	7.6 10^{-11}	2.2 10^{-5}	3.4 10^{-3}	2.6 10^{4}	1.4 10^{1}	2.6 10^{4}
^{244}Cm	2.9 10^{1}	1.7 10^{-4}	4.8 10^{-2}	3.9 10^{-1}	1.9 10^{-2}	4.5 10^{-1}	8.4 10^{-2}	4.8 10^{-2}	1.3 10^{0}	-	2.6 10^{-5}	1.2 10^{-2}	8.3 10^{4}	5.4 10^{1}	8.3 10^{4}

Table A22 Adult annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 2a) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	5.3 10^{-2}	3.8 10^{-2}	5.0 10^{-3}	3.4 10^{-4}	1.4 10^{-3}	4.8 10^{-4}	8.3 10^{-2}	7.0 10^{-4}	1.1 10^{-2}	-	-	-	5.6 10^{-1}	-	7.6 10^{-1}
^{14}C	1.6 10^{0}	1.6 10^{0}	1.6 10^{0}	1.1 10^{-1}	5.8 10^{-1}	1.9 10^{-1}	6.0 10^{0}	7.4 10^{-1}	4.4 10^{-1}	6.2 10^{-4}	-	-	3.8 10^{1}	-	5.0 10^{1}
^{35}S	3.3 10^{0}	1.8 10^{0}	1.0 10^{1}	7.3 10^{-1}	5.3 10^{0}	8.0 10^{-1}	2.8 10^{1}	2.3 10^{1}	7.6 10^{-1}	2.0 10^{-3}	-	-	3.8 10^{1}	1.1 10^{-2}	1.1 10^{2}
^{41}Ar	-	-	-	-	-	-	-	-	-	2.2 10^{-2}	3.5 10^{-1}	-	-	-	3.7 10^{-1}
^{60}Co	6.0 10^{0}	4.6 10^{-2}	4.0 10^{-1}	2.7 10^{0}	7.6 10^{-2}	2.5 10^{0}	2.1 10^{1}	2.1 10^{0}	6.3 10^{-1}	3.8 10^{-3}	6.8 10^{-1}	2.4 10^{3}	2.8 10^{2}	2.9 10^{-2}	2.7 10^{3}
^{85}Kr	-	-	-	-	-	-	-	-	-	1.1 10^{-2}	6.8 10^{-4}	-	-	-	1.2 10^{-2}
^{90}Sr	5.7 10^{1}	1.2 10^{0}	1.4 10^{0}	9.6 10^{-2}	2.3 10^{-1}	7.8 10^{-2}	9.4 10^{1}	1.3 10^{1}	5.8 10^{0}	8.5 10^{-3}	1.4 10^{-11}	5.2 10^{-5}	1.0 10^{3}	1.1 10^{-1}	1.2 10^{3}
^{106}Ru	1.1 10^{1}	3.7 10^{-2}	4.9 10^{-1}	3.3 10^{-2}	1.0 10^{-1}	3.4 10^{-2}	1.8 10^{-2}	2.1 10^{-3}	2.7 10^{-1}	5.8 10^{-2}	4.4 10^{-2}	1.6 10^{2}	7.5 10^{2}	4.9 10^{-1}	9.3 10^{2}
^{125}Sb	1.9 10^{0}	1.4 10^{-2}	2.2 10^{-1}	1.5 10^{0}	4.6 10^{-2}	1.5 10^{0}	3.2 10^{-1}	3.4 10^{-2}	2.0 10^{-1}	4.2 10^{-3}	1.3 10^{-1}	3.8 10^{2}	1.4 10^{2}	1.4 10^{-2}	5.2 10^{2}
^{129}I	1.2 10^{3}	1.8 10^{3}	4.2 10^{2}	2.8 10^{1}	1.2 10^{2}	4.1 10^{1}	8.7 10^{3}	1.1 10^{3}	1.9 10^{3}	4.6 10^{-4}	6.3 10^{-3}	5.1 10^{1}	8.7 10^{2}	8.3 10^{-1}	1.6 10^{4}
^{131}I	7.7 10^{1}	1.2 10^{1}	8.1 10^{0}	6.4 10^{-1}	2.5 10^{0}	8.2 10^{-1}	3.4 10^{2}	7.2 10^{1}	3.2 10^{1}	8.3 10^{-3}	1.1 10^{-1}	1.1 10^{2}	1.8 10^{2}	5.8 10^{-2}	8.3 10^{2}
^{133}Xe	-	-	-	-	-	-	-	-	-	4.7 10^{-3}	1.7 10^{-2}	-	-	-	2.2 10^{-2}
^{137}Cs	2.7 10^{1}	4.3 10^{1}	7.3 10^{1}	4.9 10^{0}	1.4 10^{1}	4.6 10^{0}	2.1 10^{2}	2.1 10^{1}	4.6 10^{1}	1.2 10^{-2}	3.4 10^{-2}	5.9 10^{2}	1.3 10^{2}	8.8 10^{-2}	1.2 10^{3}
^{239}Pu	4.1 10^{2}	9.1 10^{-3}	1.3 10^{0}	1.0 10^{1}	3.2 10^{-1}	7.6 10^{0}	3.3 10^{-1}	4.2 10^{-2}	9.4 10^{0}	2.5 10^{-4}	7.4 10^{-5}	7.5 10^{-2}	1.4 10^{6}	9.7 10^{2}	1.4 10^{6}
^{241}Pu	7.9 10^{0}	1.7 10^{-4}	2.4 10^{-2}	2.0 10^{-1}	6.1 10^{-3}	1.4 10^{-1}	6.2 10^{-3}	7.5 10^{-4}	1.8 10^{-1}	1.0 10^{-8}	6.9 10^{-7}	1.3 10^{-2}	2.5 10^{4}	1.7 10^{1}	2.6 10^{4}
^{241}Am	3.3 10^{2}	1.2 10^{-2}	1.0 10^{0}	8.4 10^{0}	2.6 10^{-1}	6.1 10^{0}	2.7 10^{-1}	3.5 10^{-2}	7.5 10^{0}	9.0 10^{-6}	1.0 10^{-2}	1.6 10^{1}	1.2 10^{6}	8.1 10^{2}	1.2 10^{6}
^{242}Cm	1.8 10^{1}	1.4 10^{-4}	2.8 10^{-2}	2.3 10^{-1}	8.8 10^{-3}	2.1 10^{-1}	7.4 10^{-3}	1.1 10^{-3}	4.2 10^{-1}	2.9 10^{-10}	1.8 10^{-4}	7.4 10^{-3}	1.5 10^{5}	8.4 10^{1}	1.5 10^{5}
^{244}Cm	2.0 10^{2}	2.6 10^{-3}	6.1 10^{-1}	4.9 10^{0}	1.5 10^{-1}	3.6 10^{0}	1.6 10^{-1}	2.0 10^{-2}	4.5 10^{0}	-	2.2 10^{-4}	2.6 10^{-2}	8.6 10^{5}	5.9 10^{2}	8.6 10^{5}

Table A23 Adult annual doses per unit release (1 TBq) for a cautious (Cat D) short-term release assessment (scenario 2b) (μSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$7.2\ 10^{-1}$	$5.2\ 10^{-1}$	$8.3\ 10^{-3}$	$5.6\ 10^{-4}$	$2.4\ 10^{-3}$	$8.1\ 10^{-4}$	$1.4\ 10^{-1}$	$5.7\ 10^{-3}$	$1.6\ 10^{-1}$	-	-	-	$9.2\ 10^{-1}$	-	$2.5\ 10^{0}$
^{14}C	$2.0\ 10^{1}$	$1.6\ 10^{1}$	$5.1\ 10^{0}$	$3.4\ 10^{-1}$	$1.9\ 10^{0}$	$6.5\ 10^{-1}$	$1.9\ 10^{1}$	$1.1\ 10^{1}$	$5.7\ 10^{0}$	$8.0\ 10^{-4}$	-	-	$6.6\ 10^{1}$	-	$1.4\ 10^{2}$
^{35}S	$1.4\ 10^{1}$	$5.9\ 10^{0}$	$1.2\ 10^{1}$	$8.4\ 10^{-1}$	$6.4\ 10^{0}$	$1.2\ 10^{0}$	$4.2\ 10^{1}$	$4.3\ 10^{1}$	$3.5\ 10^{0}$	$2.6\ 10^{-3}$	-	-	$6.6\ 10^{1}$	$1.1\ 10^{-2}$	$1.9\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$2.8\ 10^{-2}$	$8.1\ 10^{-1}$	-	-	-	$8.3\ 10^{-1}$
^{60}Co	$3.8\ 10^{2}$	$2.2\ 10^{-1}$	$1.7\ 10^{0}$	$1.1\ 10^{1}$	$3.0\ 10^{-1}$	$9.9\ 10^{0}$	$8.8\ 10^{1}$	$9.2\ 10^{1}$	$4.3\ 10^{0}$	$4.9\ 10^{-3}$	$1.5\ 10^{0}$	$5.1\ 10^{3}$	$5.0\ 10^{2}$	$2.9\ 10^{-2}$	$6.2\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$1.4\ 10^{-2}$	$1.4\ 10^{-3}$	-	-	-	$1.6\ 10^{-2}$
^{90}Sr	$3.3\ 10^{3}$	$5.5\ 10^{0}$	$6.0\ 10^{0}$	$4.0\ 10^{-1}$	$9.2\ 10^{-1}$	$3.1\ 10^{-1}$	$3.9\ 10^{2}$	$4.1\ 10^{2}$	$3.9\ 10^{1}$	$1.1\ 10^{-2}$	$3.2\ 10^{-11}$	$1.1\ 10^{-4}$	$1.8\ 10^{3}$	$1.1\ 10^{-1}$	$6.0\ 10^{3}$
^{106}Ru	$6.1\ 10^{2}$	$1.4\ 10^{-1}$	$2.0\ 10^{0}$	$1.4\ 10^{-1}$	$4.0\ 10^{-1}$	$1.3\ 10^{-1}$	$7.6\ 10^{-2}$	$8.0\ 10^{-2}$	$5.0\ 10^{0}$	$7.5\ 10^{-2}$	$8.5\ 10^{-2}$	$3.4\ 10^{2}$	$1.3\ 10^{3}$	$1.0\ 10^{0}$	$2.3\ 10^{3}$
^{125}Sb	$1.2\ 10^{2}$	$6.5\ 10^{-2}$	$9.5\ 10^{-1}$	$6.3\ 10^{0}$	$1.8\ 10^{-1}$	$5.9\ 10^{0}$	$1.4\ 10^{0}$	$1.4\ 10^{0}$	$1.3\ 10^{0}$	$5.3\ 10^{-3}$	$2.6\ 10^{-1}$	$8.2\ 10^{2}$	$2.4\ 10^{2}$	$1.4\ 10^{-2}$	$1.2\ 10^{3}$
^{129}I	$3.2\ 10^{4}$	$8.8\ 10^{3}$	$9.0\ 10^{2}$	$6.0\ 10^{1}$	$2.4\ 10^{2}$	$8.1\ 10^{1}$	$1.9\ 10^{4}$	$2.0\ 10^{4}$	$9.2\ 10^{3}$	$5.9\ 10^{-4}$	$1.2\ 10^{-2}$	$7.2\ 10^{1}$	$1.5\ 10^{3}$	$8.3\ 10^{-1}$	$9.1\ 10^{4}$
^{131}I	$2.2\ 10^{2}$	$1.3\ 10^{1}$	$1.6\ 10^{1}$	$1.2\ 10^{0}$	$4.8\ 10^{0}$	$1.6\ 10^{0}$	$6.6\ 10^{2}$	$5.9\ 10^{2}$	$1.5\ 10^{1}$	$1.1\ 10^{-2}$	$2.1\ 10^{-1}$	$1.5\ 10^{2}$	$3.1\ 10^{2}$	$5.8\ 10^{-2}$	$2.0\ 10^{3}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$6.0\ 10^{-3}$	$3.6\ 10^{-2}$	-	-	-	$4.2\ 10^{-2}$
^{137}Cs	$1.5\ 10^{3}$	$4.2\ 10^{2}$	$3.1\ 10^{2}$	$2.1\ 10^{1}$	$5.4\ 10^{1}$	$1.8\ 10^{1}$	$8.8\ 10^{2}$	$3.0\ 10^{2}$	$4.5\ 10^{2}$	$1.5\ 10^{-2}$	$6.5\ 10^{-2}$	$1.3\ 10^{3}$	$2.3\ 10^{2}$	$1.8\ 10^{-1}$	$5.5\ 10^{3}$
^{239}Pu	$3.0\ 10^{4}$	$4.0\ 10^{-2}$	$5.4\ 10^{0}$	$4.4\ 10^{1}$	$1.3\ 10^{0}$	$3.0\ 10^{1}$	$1.4\ 10^{0}$	$1.4\ 10^{0}$	$2.5\ 10^{2}$	$3.1\ 10^{-4}$	$1.5\ 10^{-4}$	$1.6\ 10^{-1}$	$2.5\ 10^{6}$	$2.0\ 10^{3}$	$2.5\ 10^{6}$
^{241}Pu	$5.6\ 10^{2}$	$7.5\ 10^{-4}$	$1.0\ 10^{-1}$	$8.2\ 10^{-1}$	$2.4\ 10^{-2}$	$5.6\ 10^{-1}$	$2.6\ 10^{-2}$	$2.7\ 10^{-2}$	$4.6\ 10^{0}$	$1.3\ 10^{-8}$	$1.5\ 10^{-6}$	$2.8\ 10^{-2}$	$4.5\ 10^{4}$	$3.6\ 10^{1}$	$4.5\ 10^{4}$
^{241}Am	$2.4\ 10^{4}$	$5.1\ 10^{-2}$	$4.3\ 10^{0}$	$3.5\ 10^{1}$	$1.0\ 10^{0}$	$2.4\ 10^{1}$	$1.1\ 10^{0}$	$1.2\ 10^{0}$	$2.0\ 10^{2}$	$1.1\ 10^{-5}$	$2.1\ 10^{-2}$	$3.4\ 10^{1}$	$2.1\ 10^{6}$	$1.7\ 10^{3}$	$2.1\ 10^{6}$
^{242}Cm	$7.4\ 10^{2}$	$4.8\ 10^{-4}$	$1.2\ 10^{-1}$	$9.4\ 10^{-1}$	$3.5\ 10^{-2}$	$8.1\ 10^{-1}$	$3.0\ 10^{-2}$	$3.2\ 10^{-2}$	$6.1\ 10^{0}$	$3.6\ 10^{-10}$	$3.5\ 10^{-4}$	$7.4\ 10^{-3}$	$2.6\ 10^{5}$	$1.8\ 10^{2}$	$2.6\ 10^{5}$
^{244}Cm	$1.4\ 10^{4}$	$1.1\ 10^{-2}$	$2.5\ 10^{0}$	$2.1\ 10^{1}$	$5.9\ 10^{-1}$	$1.4\ 10^{1}$	$6.5\ 10^{-1}$	$6.8\ 10^{-1}$	$1.2\ 10^{2}$	-	$4.3\ 10^{-4}$	$2.6\ 10^{-2}$	$1.5\ 10^{6}$	$1.2\ 10^{3}$	$1.5\ 10^{6}$

Table A24 Adult annual doses per unit release (1 TBq) for a cautious (Cat F) short-term release assessment (scenario 2c) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	2.5 10^{0}	1.8 10^{0}	2.7 10^{-2}	1.8 10^{-3}	8.0 10^{-3}	2.7 10^{-3}	4.3 10^{-1}	1.8 10^{-2}	5.3 10^{-1}	-	-	-	2.4 10^{0}	-	7.7 10^{0}
^{14}C	8.7 10^{1}	6.9 10^{1}	2.2 10^{1}	1.5 10^{0}	8.6 10^{0}	2.9 10^{0}	7.9 10^{1}	4.5 10^{1}	2.5 10^{1}	2.5 10^{-3}	-	-	2.2 10^{2}	-	5.6 10^{2}
^{35}S	4.9 10^{1}	2.0 10^{1}	1.8 10^{1}	1.3 10^{0}	1.1 10^{1}	2.5 10^{0}	9.4 10^{1}	9.7 10^{1}	1.2 10^{1}	7.2 10^{-3}	-	-	1.9 10^{2}	1.1 10^{-2}	5.0 10^{2}
^{41}Ar	-	-	-	-	-	-	-	-	-	8.7 10^{-2}	2.0 10^{0}	-	-	-	2.1 10^{0}
^{60}Co	3.5 10^{2}	2.0 10^{-1}	1.5 10^{0}	1.0 10^{1}	2.7 10^{-1}	9.0 10^{0}	8.0 10^{1}	8.4 10^{1}	3.9 10^{0}	1.5 10^{-2}	3.8 10^{0}	8.1 10^{3}	1.6 10^{3}	2.9 10^{-2}	1.0 10^{4}
^{85}Kr	-	-	-	-	-	-	-	-	-	4.5 10^{-2}	3.4 10^{-3}	-	-	-	4.8 10^{-2}
^{90}Sr	3.0 10^{3}	5.0 10^{0}	5.4 10^{0}	3.6 10^{-1}	8.4 10^{-1}	2.8 10^{-1}	3.6 10^{2}	3.7 10^{2}	3.5 10^{1}	3.3 10^{-2}	2.1 10^{-10}	1.8 10^{-4}	5.7 10^{3}	1.1 10^{-1}	9.5 10^{3}
^{106}Ru	5.5 10^{2}	1.3 10^{-1}	1.9 10^{0}	1.2 10^{-1}	3.6 10^{-1}	1.2 10^{-1}	6.9 10^{-2}	7.2 10^{-2}	4.6 10^{0}	2.4 10^{-1}	2.9 10^{-1}	5.4 10^{2}	4.4 10^{3}	1.6 10^{0}	5.5 10^{3}
^{125}Sb	1.1 10^{2}	5.9 10^{-2}	8.6 10^{-1}	5.8 10^{0}	1.6 10^{-1}	5.4 10^{0}	1.3 10^{0}	1.3 10^{0}	1.2 10^{0}	1.6 10^{-2}	6.2 10^{-1}	1.3 10^{3}	7.6 10^{2}	1.4 10^{-2}	2.2 10^{3}
^{129}I	6.5 10^{4}	1.8 10^{4}	1.8 10^{3}	1.2 10^{2}	4.7 10^{2}	1.6 10^{2}	3.7 10^{4}	3.9 10^{4}	1.9 10^{4}	1.4 10^{-3}	2.7 10^{-2}	1.6 10^{2}	3.8 10^{3}	8.3 10^{-1}	1.8 10^{5}
^{131}I	4.3 10^{2}	2.3 10^{1}	3.0 10^{1}	2.4 10^{0}	9.2 10^{0}	3.0 10^{0}	1.3 10^{3}	1.1 10^{3}	2.8 10^{1}	2.5 10^{-2}	4.5 10^{-1}	3.1 10^{2}	7.7 10^{2}	5.8 10^{-2}	4.0 10^{3}
^{133}Xe	-	-	-	-	-	-	-	-	-	1.9 10^{-2}	9.0 10^{-2}	-	-	-	1.1 10^{-1}
^{137}Cs	1.4 10^{3}	3.8 10^{2}	2.8 10^{2}	1.9 10^{1}	4.9 10^{1}	1.6 10^{1}	8.0 10^{2}	2.7 10^{2}	4.1 10^{2}	4.5 10^{-2}	3.0 10^{-1}	2.0 10^{3}	7.3 10^{2}	2.9 10^{-1}	6.4 10^{3}
^{239}Pu	2.7 10^{4}	3.6 10^{-2}	4.9 10^{0}	4.0 10^{1}	1.1 10^{0}	2.7 10^{1}	1.3 10^{0}	1.3 10^{0}	2.2 10^{2}	9.5 10^{-4}	4.1 10^{-4}	2.5 10^{-1}	7.9 10^{6}	3.1 10^{3}	7.9 10^{6}
^{241}Pu	5.1 10^{2}	6.8 10^{-4}	9.2 10^{-2}	7.4 10^{-1}	2.2 10^{-2}	5.1 10^{-1}	2.3 10^{-2}	2.5 10^{-2}	4.2 10^{0}	4.0 10^{-8}	3.6 10^{-6}	4.5 10^{-2}	1.4 10^{5}	5.6 10^{1}	1.4 10^{5}
^{241}Am	2.2 10^{4}	4.7 10^{-2}	3.9 10^{0}	3.2 10^{1}	9.1 10^{-1}	2.2 10^{1}	1.0 10^{0}	1.1 10^{0}	1.8 10^{2}	3.5 10^{-5}	5.1 10^{-2}	5.3 10^{1}	6.6 10^{6}	2.6 10^{3}	6.7 10^{6}
^{242}Cm	6.7 10^{2}	4.4 10^{-4}	1.1 10^{-1}	8.6 10^{-1}	3.2 10^{-2}	7.3 10^{-1}	2.8 10^{-2}	2.9 10^{-2}	5.5 10^{0}	1.1 10^{-9}	1.0 10^{-3}	7.4 10^{-3}	8.2 10^{5}	2.7 10^{2}	8.2 10^{5}
^{244}Cm	1.3 10^{4}	1.0 10^{-2}	2.3 10^{0}	1.9 10^{1}	5.4 10^{-1}	1.3 10^{1}	5.9 10^{-1}	6.2 10^{-1}	1.1 10^{2}	-	1.2 10^{-3}	2.6 10^{-2}	4.9 10^{6}	1.9 10^{3}	4.9 10^{6}

Table A25 Adult annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 3a) (μSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	2.3 10^{-2}	1.7 10^{-2}	2.5 10^{-3}	1.7 10^{-4}	6.4 10^{-4}	2.1 10^{-4}	4.2 10^{-2}	8.5 10^{-4}	4.7 10^{-3}	-	-	-	3.3 10^{-1}	-	4.3 10^{-1}
^{14}C	9.3 10^{-1}	1.2 10^{0}	7.8 10^{-1}	5.2 10^{-2}	2.4 10^{-1}	8.1 10^{-2}	3.1 10^{0}	9.1 10^{-1}	3.1 10^{-1}	3.2 10^{-4}	-	-	1.8 10^{1}	-	2.6 10^{1}
^{35}S	2.0 10^{0}	1.2 10^{0}	1.2 10^{1}	8.5 10^{-1}	6.1 10^{0}	8.5 10^{-1}	2.9 10^{1}	2.8 10^{1}	3.5 10^{-1}	1.0 10^{-3}	-	-	1.8 10^{1}	1.3 10^{-2}	9.9 10^{1}
^{41}Ar	-	-	-	-	-	-	-	-	-	1.1 10^{-2}	1.8 10^{-1}	-	-	-	1.9 10^{-1}
^{60}Co	3.1 10^{0}	1.9 10^{-2}	1.7 10^{-1}	1.2 10^{0}	3.9 10^{-2}	1.3 10^{0}	8.7 10^{0}	2.6 10^{0}	2.5 10^{-1}	1.9 10^{-3}	3.6 10^{-1}	1.0 10^{3}	1.4 10^{2}	3.6 10^{-2}	1.2 10^{3}
^{85}Kr	-	-	-	-	-	-	-	-	-	5.7 10^{-3}	3.5 10^{-4}	-	-	-	6.1 10^{-3}
^{90}Sr	2.8 10^{1}	4.9 10^{-1}	6.4 10^{-1}	4.3 10^{-2}	1.2 10^{-1}	3.9 10^{-2}	4.2 10^{1}	1.6 10^{1}	2.3 10^{0}	4.4 10^{-3}	4.7 10^{-12}	2.2 10^{-5}	4.9 10^{2}	1.3 10^{-1}	5.8 10^{2}
^{106}Ru	5.8 10^{0}	1.6 10^{-2}	2.2 10^{-1}	1.5 10^{-2}	5.2 10^{-2}	1.7 10^{-2}	7.8 10^{-3}	2.6 10^{-3}	1.3 10^{-1}	2.7 10^{-2}	2.1 10^{-2}	6.8 10^{1}	3.3 10^{2}	2.3 10^{-1}	4.1 10^{2}
^{125}Sb	9.9 10^{-1}	5.7 10^{-3}	9.4 10^{-2}	6.3 10^{-1}	2.3 10^{-2}	7.7 10^{-1}	1.4 10^{-1}	4.1 10^{-2}	8.0 10^{-2}	2.1 10^{-3}	6.5 10^{-2}	1.6 10^{2}	6.5 10^{1}	1.7 10^{-2}	2.3 10^{2}
^{129}I	6.6 10^{2}	8.3 10^{2}	1.9 10^{2}	1.2 10^{1}	6.8 10^{1}	2.2 10^{1}	3.8 10^{3}	1.4 10^{3}	6.6 10^{2}	2.3 10^{-4}	3.2 10^{-3}	2.2 10^{1}	4.1 10^{2}	1.0 10^{0}	8.1 10^{3}
^{131}I	4.3 10^{1}	7.2 10^{0}	4.6 10^{0}	3.6 10^{-1}	1.4 10^{0}	4.6 10^{-1}	1.9 10^{2}	8.8 10^{1}	1.4 10^{1}	4.2 10^{-3}	5.3 10^{-2}	5.3 10^{1}	8.5 10^{1}	7.1 10^{-2}	4.8 10^{2}
^{133}Xe	-	-	-	-	-	-	-	-	-	2.4 10^{-3}	8.9 10^{-3}	-	-	-	1.1 10^{-2}
^{137}Cs	1.4 10^{1}	1.8 10^{1}	3.1 10^{1}	2.1 10^{0}	7.0 10^{0}	2.3 10^{0}	8.7 10^{1}	2.6 10^{1}	1.6 10^{1}	6.0 10^{-3}	1.6 10^{-2}	2.5 10^{2}	6.2 10^{1}	4.1 10^{-2}	5.2 10^{2}
^{239}Pu	2.2 10^{2}	3.7 10^{-3}	5.7 10^{-1}	4.6 10^{0}	1.6 10^{-1}	3.9 10^{0}	1.5 10^{-1}	5.1 10^{-2}	4.6 10^{0}	1.3 10^{-4}	3.7 10^{-5}	3.2 10^{-2}	6.7 10^{5}	4.6 10^{2}	6.7 10^{5}
^{241}Pu	4.1 10^{0}	6.9 10^{-5}	1.1 10^{-2}	8.6 10^{-2}	3.1 10^{-3}	7.2 10^{-2}	2.7 10^{-3}	9.2 10^{-4}	8.8 10^{-2}	5.3 10^{-9}	3.6 10^{-7}	5.2 10^{-3}	1.2 10^{4}	8.2 10^{0}	1.2 10^{4}
^{241}Am	1.7 10^{2}	4.7 10^{-3}	4.6 10^{-1}	3.7 10^{0}	1.3 10^{-1}	3.1 10^{0}	1.2 10^{-1}	4.2 10^{-2}	3.6 10^{0}	4.6 10^{-6}	5.2 10^{-3}	6.6 10^{0}	5.7 10^{5}	3.8 10^{2}	5.7 10^{5}
^{242}Cm	9.5 10^{0}	6.1 10^{-5}	1.3 10^{-2}	1.1 10^{-1}	4.5 10^{-3}	1.0 10^{-1}	3.4 10^{-3}	1.4 10^{-3}	2.0 10^{-1}	1.5 10^{-10}	9.0 10^{-5}	9.1 10^{-3}	7.0 10^{4}	3.9 10^{1}	7.1 10^{4}
^{244}Cm	1.0 10^{2}	1.0 10^{-3}	2.7 10^{-1}	2.2 10^{0}	7.6 10^{-2}	1.8 10^{0}	6.8 10^{-2}	2.4 10^{-2}	2.2 10^{0}	-	1.1 10^{-4}	3.2 10^{-2}	3.9 10^{5}	2.7 10^{2}	3.9 10^{5}

Table A26 Adult annual doses per unit release (1 TBq) for a cautious (Cat D) short-term release assessment (scenario 3b) (μSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$2.5\ 10^{-1}$	$1.8\ 10^{-1}$	$3.6\ 10^{-3}$	$2.4\ 10^{-4}$	$9.8\ 10^{-4}$	$3.3\ 10^{-4}$	$6.0\ 10^{-2}$	$2.5\ 10^{-3}$	$5.3\ 10^{-2}$	-	-	-	$4.5\ 10^{-1}$	-	$1.0\ 10^{0}$
^{14}C	$6.9\ 10^{0}$	$5.9\ 10^{0}$	$1.9\ 10^{0}$	$1.3\ 10^{-1}$	$7.0\ 10^{-1}$	$2.3\ 10^{-1}$	$7.3\ 10^{0}$	$4.2\ 10^{0}$	$2.1\ 10^{0}$	$3.8\ 10^{-4}$	-	-	$2.7\ 10^{1}$	-	$5.7\ 10^{1}$
^{35}S	$5.5\ 10^{0}$	$2.5\ 10^{0}$	$1.3\ 10^{1}$	$8.9\ 10^{-1}$	$6.5\ 10^{0}$	$9.7\ 10^{-1}$	$3.4\ 10^{1}$	$3.5\ 10^{1}$	$1.3\ 10^{0}$	$1.2\ 10^{-3}$	-	-	$2.7\ 10^{1}$	$1.3\ 10^{-2}$	$1.3\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$1.3\ 10^{-2}$	$3.4\ 10^{-1}$	-	-	-	$3.5\ 10^{-1}$
^{60}Co	$1.3\ 10^{2}$	$7.7\ 10^{-2}$	$6.0\ 10^{-1}$	$4.0\ 10^{0}$	$1.1\ 10^{-1}$	$3.7\ 10^{0}$	$3.1\ 10^{1}$	$3.3\ 10^{1}$	$1.5\ 10^{0}$	$2.3\ 10^{-3}$	$6.5\ 10^{-1}$	$1.9\ 10^{3}$	$2.1\ 10^{2}$	$3.6\ 10^{-2}$	$2.3\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$6.8\ 10^{-3}$	$5.8\ 10^{-4}$	-	-	-	$7.3\ 10^{-3}$
^{90}Sr	$1.1\ 10^{3}$	$1.9\ 10^{0}$	$2.2\ 10^{0}$	$1.4\ 10^{-1}$	$3.5\ 10^{-1}$	$1.2\ 10^{-1}$	$1.4\ 10^{2}$	$1.5\ 10^{2}$	$1.3\ 10^{1}$	$5.2\ 10^{-3}$	$1.1\ 10^{-11}$	$4.2\ 10^{-5}$	$7.4\ 10^{2}$	$1.3\ 10^{-1}$	$2.2\ 10^{3}$
^{106}Ru	$2.1\ 10^{2}$	$5.2\ 10^{-2}$	$7.4\ 10^{-1}$	$4.9\ 10^{-2}$	$1.5\ 10^{-1}$	$5.0\ 10^{-2}$	$2.7\ 10^{-2}$	$2.8\ 10^{-2}$	$1.7\ 10^{0}$	$3.3\ 10^{-2}$	$3.5\ 10^{-2}$	$1.3\ 10^{2}$	$5.3\ 10^{2}$	$4.1\ 10^{-1}$	$8.7\ 10^{2}$
^{125}Sb	$3.9\ 10^{1}$	$2.3\ 10^{-2}$	$3.4\ 10^{-1}$	$2.2\ 10^{0}$	$6.7\ 10^{-2}$	$2.2\ 10^{0}$	$4.9\ 10^{-1}$	$5.1\ 10^{-1}$	$4.5\ 10^{-1}$	$2.5\ 10^{-3}$	$1.1\ 10^{-1}$	$3.1\ 10^{2}$	$9.8\ 10^{1}$	$1.7\ 10^{-2}$	$4.5\ 10^{2}$
^{129}I	$1.1\ 10^{4}$	$3.1\ 10^{3}$	$3.5\ 10^{2}$	$2.3\ 10^{1}$	$1.1\ 10^{2}$	$3.6\ 10^{1}$	$7.2\ 10^{3}$	$7.5\ 10^{3}$	$3.1\ 10^{3}$	$2.8\ 10^{-4}$	$5.2\ 10^{-3}$	$2.9\ 10^{1}$	$6.3\ 10^{2}$	$1.0\ 10^{0}$	$3.3\ 10^{4}$
^{131}I	$9.1\ 10^{1}$	$7.4\ 10^{0}$	$7.1\ 10^{0}$	$5.6\ 10^{-1}$	$2.2\ 10^{0}$	$7.2\ 10^{-1}$	$2.9\ 10^{2}$	$2.6\ 10^{2}$	$7.8\ 10^{0}$	$5.0\ 10^{-3}$	$8.9\ 10^{-2}$	$6.7\ 10^{1}$	$1.3\ 10^{2}$	$7.1\ 10^{-2}$	$8.7\ 10^{2}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$2.9\ 10^{-3}$	$1.5\ 10^{-2}$	-	-	-	$1.8\ 10^{-2}$
^{137}Cs	$5.2\ 10^{2}$	$1.4\ 10^{2}$	$1.1\ 10^{2}$	$7.4\ 10^{0}$	$2.0\ 10^{1}$	$6.8\ 10^{0}$	$3.1\ 10^{2}$	$1.2\ 10^{2}$	$1.5\ 10^{2}$	$7.1\ 10^{-3}$	$2.7\ 10^{-2}$	$4.8\ 10^{2}$	$9.5\ 10^{1}$	$7.4\ 10^{-2}$	$2.0\ 10^{3}$
^{239}Pu	$1.0\ 10^{4}$	$1.4\ 10^{-2}$	$1.9\ 10^{0}$	$1.6\ 10^{1}$	$4.7\ 10^{-1}$	$1.1\ 10^{1}$	$5.0\ 10^{-1}$	$5.2\ 10^{-1}$	$8.4\ 10^{1}$	$1.5\ 10^{-4}$	$6.2\ 10^{-5}$	$6.0\ 10^{-2}$	$1.0\ 10^{6}$	$8.0\ 10^{2}$	$1.0\ 10^{6}$
^{241}Pu	$1.9\ 10^{2}$	$2.6\ 10^{-4}$	$3.6\ 10^{-2}$	$2.9\ 10^{-1}$	$9.0\ 10^{-3}$	$2.1\ 10^{-1}$	$9.3\ 10^{-3}$	$9.7\ 10^{-3}$	$1.6\ 10^{0}$	$6.3\ 10^{-9}$	$6.1\ 10^{-7}$	$1.0\ 10^{-2}$	$1.9\ 10^{4}$	$1.4\ 10^{1}$	$1.9\ 10^{4}$
^{241}Am	$8.1\ 10^{3}$	$1.8\ 10^{-2}$	$1.6\ 10^{0}$	$1.3\ 10^{1}$	$3.8\ 10^{-1}$	$9.0\ 10^{0}$	$4.0\ 10^{-1}$	$4.2\ 10^{-1}$	$6.7\ 10^{1}$	$5.4\ 10^{-6}$	$8.8\ 10^{-3}$	$1.3\ 10^{1}$	$8.7\ 10^{5}$	$6.8\ 10^{2}$	$8.8\ 10^{5}$
^{242}Cm	$2.5\ 10^{2}$	$1.8\ 10^{-4}$	$4.3\ 10^{-2}$	$3.4\ 10^{-1}$	$1.3\ 10^{-2}$	$3.0\ 10^{-1}$	$1.1\ 10^{-2}$	$1.2\ 10^{-2}$	$2.1\ 10^{0}$	$1.7\ 10^{-10}$	$1.5\ 10^{-4}$	$9.1\ 10^{-3}$	$1.1\ 10^{5}$	$7.0\ 10^{1}$	$1.1\ 10^{5}$
^{244}Cm	$4.8\ 10^{3}$	$4.0\ 10^{-3}$	$9.1\ 10^{-1}$	$7.4\ 10^{0}$	$2.2\ 10^{-1}$	$5.3\ 10^{0}$	$2.3\ 10^{-1}$	$2.4\ 10^{-1}$	$3.9\ 10^{1}$	-	$1.8\ 10^{-4}$	$3.2\ 10^{-2}$	$6.1\ 10^{5}$	$4.8\ 10^{2}$	$6.2\ 10^{5}$

Table A27   Adult annual doses per unit release (1 TBq) for a cautious (Cat F) short-term release assessment (scenario 3c) (μSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	8.4 10^{-1}	6.0 10^{-1}	9.7 10^{-3}	6.5 10^{-4}	2.8 10^{-3}	9.4 10^{-4}	1.6 10^{-1}	6.7 10^{-3}	1.8 10^{-1}	-	-	-	9.6 10^{-1}	-	2.7 10^{0}
^{14}C	2.9 10^{1}	2.3 10^{1}	7.6 10^{0}	5.0 10^{-1}	2.9 10^{0}	9.7 10^{-1}	2.7 10^{1}	1.6 10^{1}	8.4 10^{0}	9.4 10^{-4}	-	-	7.8 10^{1}	-	1.9 10^{2}
^{35}S	1.7 10^{1}	7.2 10^{0}	1.5 10^{1}	1.0 10^{0}	7.8 10^{0}	1.4 10^{0}	5.1 10^{1}	5.3 10^{1}	4.3 10^{0}	2.8 10^{-3}	-	-	6.9 10^{1}	1.3 10^{-2}	2.3 10^{2}
^{41}Ar	-	-	-	-	-	-	-	-	-	3.3 10^{-2}	7.3 10^{-1}	-	-	-	7.7 10^{-1}
^{60}Co	1.2 10^{2}	7.0 10^{-2}	5.5 10^{-1}	3.7 10^{0}	1.0 10^{-1}	3.4 10^{0}	2.9 10^{1}	3.0 10^{1}	1.3 10^{0}	5.6 10^{-3}	1.4 10^{0}	2.9 10^{3}	5.7 10^{2}	3.6 10^{-2}	3.7 10^{3}
^{85}Kr	-	-	-	-	-	-	-	-	-	1.7 10^{-2}	1.2 10^{-3}	-	-	-	1.8 10^{-2}
^{90}Sr	1.0 10^{3}	1.8 10^{0}	2.0 10^{0}	1.3 10^{-1}	3.2 10^{-1}	1.1 10^{-1}	1.3 10^{2}	1.4 10^{2}	1.2 10^{1}	1.3 10^{-2}	7.1 10^{-11}	6.3 10^{-5}	2.0 10^{3}	1.3 10^{-1}	3.3 10^{3}
^{106}Ru	1.9 10^{2}	4.7 10^{-2}	6.7 10^{-1}	4.5 10^{-2}	1.4 10^{-1}	4.6 10^{-2}	2.5 10^{-2}	2.6 10^{-2}	1.6 10^{0}	8.7 10^{-2}	1.0 10^{-1}	1.9 10^{2}	1.5 10^{3}	6.0 10^{-1}	1.9 10^{3}
^{125}Sb	3.6 10^{1}	2.1 10^{-2}	3.1 10^{-1}	2.1 10^{0}	6.2 10^{-2}	2.1 10^{0}	4.5 10^{-1}	4.7 10^{-1}	4.1 10^{-1}	6.1 10^{-3}	2.3 10^{-1}	4.7 10^{2}	2.7 10^{2}	1.7 10^{-2}	7.8 10^{2}
^{129}I	2.2 10^{4}	6.1 10^{3}	6.4 10^{2}	4.3 10^{1}	1.8 10^{2}	6.0 10^{1}	1.3 10^{4}	1.4 10^{4}	6.3 10^{3}	5.5 10^{-4}	1.0 10^{-2}	5.9 10^{1}	1.4 10^{3}	1.0 10^{0}	6.4 10^{4}
^{131}I	1.6 10^{2}	1.1 10^{1}	1.2 10^{1}	9.4 10^{-1}	3.6 10^{0}	1.2 10^{0}	5.0 10^{2}	4.4 10^{2}	1.2 10^{1}	9.8 10^{-3}	1.7 10^{-1}	1.2 10^{2}	2.8 10^{2}	7.1 10^{-2}	1.5 10^{3}
^{133}Xe	-	-	-	-	-	-	-	-	-	7.1 10^{-3}	3.3 10^{-2}	-	-	-	4.0 10^{-2}
^{137}Cs	4.7 10^{2}	1.3 10^{2}	1.0 10^{2}	6.7 10^{0}	1.9 10^{1}	6.3 10^{0}	2.8 10^{2}	1.1 10^{2}	1.4 10^{2}	1.7 10^{-2}	1.0 10^{-1}	7.2 10^{2}	2.6 10^{2}	1.1 10^{-1}	2.3 10^{3}
^{239}Pu	9.2 10^{3}	1.3 10^{-2}	1.8 10^{0}	1.4 10^{1}	4.4 10^{-1}	1.0 10^{1}	4.5 10^{-1}	4.8 10^{-1}	7.6 10^{1}	3.6 10^{-4}	1.5 10^{-4}	9.1 10^{-2}	2.8 10^{6}	1.2 10^{3}	2.8 10^{6}
^{241}Pu	1.7 10^{2}	2.4 10^{-4}	3.3 10^{-2}	2.7 10^{-1}	8.2 10^{-3}	1.9 10^{-1}	8.5 10^{-3}	8.8 10^{-3}	1.4 10^{0}	1.5 10^{-8}	1.3 10^{-6}	1.6 10^{-2}	5.1 10^{4}	2.1 10^{1}	5.1 10^{4}
^{241}Am	7.3 10^{3}	1.6 10^{-2}	1.4 10^{0}	1.2 10^{1}	3.5 10^{-1}	8.3 10^{0}	3.6 10^{-1}	3.8 10^{-1}	6.1 10^{1}	1.3 10^{-5}	1.9 10^{-2}	1.9 10^{1}	2.4 10^{6}	9.9 10^{2}	2.4 10^{6}
^{242}Cm	2.3 10^{2}	1.6 10^{-4}	3.9 10^{-2}	3.1 10^{-1}	1.2 10^{-2}	2.8 10^{-1}	1.0 10^{-2}	1.1 10^{-2}	1.9 10^{0}	4.2 10^{-10}	3.6 10^{-4}	9.1 10^{-3}	3.0 10^{5}	1.0 10^{2}	3.0 10^{5}
^{244}Cm	4.3 10^{3}	3.6 10^{-3}	8.4 10^{-1}	6.7 10^{0}	2.1 10^{-1}	4.9 10^{0}	2.1 10^{-1}	2.2 10^{-1}	3.6 10^{1}	-	4.3 10^{-4}	3.2 10^{-2}	1.7 10^{6}	7.2 10^{2}	1.7 10^{6}

Table A28 Child annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 2a) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$3.0\ 10^{-2}$	$4.5\ 10^{-2}$	$4.3\ 10^{-3}$	$2.2\ 10^{-4}$	$9.3\ 10^{-4}$	$3.1\ 10^{-4}$	$1.1\ 10^{-1}$	$6.7\ 10^{-4}$	$1.5\ 10^{-2}$	-	-	-	$5.2\ 10^{-1}$	-	$7.3\ 10^{-1}$
^{14}C	$9.6\ 10^{-1}$	$1.9\ 10^{0}$	$1.5\ 10^{0}$	$7.4\ 10^{-2}$	$4.0\ 10^{-1}$	$1.3\ 10^{-1}$	$8.8\ 10^{0}$	$7.5\ 10^{-1}$	$6.1\ 10^{-1}$	$6.2\ 10^{-4}$	-	-	$3.7\ 10^{1}$	-	$5.2\ 10^{1}$
^{35}S	$2.9\ 10^{0}$	$3.4\ 10^{0}$	$1.5\ 10^{1}$	$7.5\ 10^{-1}$	$5.5\ 10^{0}$	$8.3\ 10^{-1}$	$6.1\ 10^{1}$	$3.7\ 10^{1}$	$1.6\ 10^{0}$	$2.0\ 10^{-3}$	-	-	$3.9\ 10^{1}$	$1.1\ 10^{-2}$	$1.7\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$2.2\ 10^{-2}$	$2.1\ 10^{-1}$	-	-	-	$2.3\ 10^{-1}$
^{60}Co	$8.2\ 10^{0}$	$1.3\ 10^{-1}$	$8.6\ 10^{-1}$	$4.3\ 10^{0}$	$1.2\ 10^{-1}$	$4.1\ 10^{0}$	$7.0\ 10^{1}$	$5.1\ 10^{0}$	$2.1\ 10^{0}$	$3.8\ 10^{-3}$	$4.1\ 10^{-1}$	$1.0\ 10^{3}$	$3.1\ 10^{2}$	$3.1\ 10^{-2}$	$1.5\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$1.1\ 10^{-2}$	$4.1\ 10^{-4}$	-	-	-	$1.2\ 10^{-2}$
^{90}Sr	$5.2\ 10^{1}$	$2.3\ 10^{0}$	$2.1\ 10^{0}$	$1.0\ 10^{-1}$	$2.5\ 10^{-1}$	$8.4\ 10^{-2}$	$2.1\ 10^{2}$	$2.0\ 10^{1}$	$1.2\ 10^{1}$	$8.5\ 10^{-3}$	$8.4\ 10^{-12}$	$2.3\ 10^{-5}$	$1.0\ 10^{3}$	$1.1\ 10^{-1}$	$1.3\ 10^{3}$
^{106}Ru	$1.0\ 10^{1}$	$7.1\ 10^{-2}$	$7.0\ 10^{-1}$	$3.5\ 10^{-2}$	$1.1\ 10^{-1}$	$3.6\ 10^{-2}$	$4.1\ 10^{-2}$	$3.4\ 10^{-3}$	$5.8\ 10^{-1}$	$5.8\ 10^{-2}$	$2.6\ 10^{-2}$	$7.0\ 10^{1}$	$8.0\ 10^{2}$	$4.4\ 10^{-1}$	$8.9\ 10^{2}$
^{125}Sb	$1.6\ 10^{0}$	$2.4\ 10^{-2}$	$2.8\ 10^{-1}$	$1.4\ 10^{0}$	$4.3\ 10^{-2}$	$1.5\ 10^{0}$	$6.5\ 10^{-1}$	$4.9\ 10^{-2}$	$3.9\ 10^{-1}$	$4.2\ 10^{-3}$	$7.7\ 10^{-2}$	$1.7\ 10^{2}$	$1.4\ 10^{2}$	$1.4\ 10^{-2}$	$3.1\ 10^{2}$
^{129}I	$8.7\ 10^{2}$	$2.8\ 10^{3}$	$4.9\ 10^{2}$	$2.4\ 10^{1}$	$1.1\ 10^{2}$	$3.5\ 10^{1}$	$1.6\ 10^{4}$	$1.5\ 10^{3}$	$3.2\ 10^{3}$	$4.6\ 10^{-4}$	$3.8\ 10^{-3}$	$2.3\ 10^{1}$	$1.2\ 10^{3}$	$1.1\ 10^{0}$	$2.6\ 10^{4}$
^{131}I	$7.8\ 10^{1}$	$2.6\ 10^{1}$	$1.3\ 10^{1}$	$7.5\ 10^{-1}$	$2.9\ 10^{0}$	$9.6\ 10^{-1}$	$8.3\ 10^{2}$	$1.3\ 10^{2}$	$7.7\ 10^{1}$	$8.3\ 10^{-3}$	$6.3\ 10^{-2}$	$4.7\ 10^{1}$	$3.3\ 10^{2}$	$1.1\ 10^{-1}$	$1.5\ 10^{3}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$4.7\ 10^{-3}$	$1.0\ 10^{-2}$	-	-	-	$1.5\ 10^{-2}$
^{137}Cs	$8.8\ 10^{0}$	$2.9\ 10^{1}$	$3.8\ 10^{1}$	$1.9\ 10^{0}$	$5.3\ 10^{0}$	$1.8\ 10^{0}$	$1.7\ 10^{2}$	$1.2\ 10^{1}$	$3.5\ 10^{1}$	$1.2\ 10^{-2}$	$2.0\ 10^{-2}$	$2.6\ 10^{2}$	$7.6\ 10^{1}$	$4.3\ 10^{-2}$	$6.3\ 10^{2}$
^{239}Pu	$1.9\ 10^{2}$	$8.8\ 10^{-3}$	$9.3\ 10^{-1}$	$5.6\ 10^{0}$	$1.7\ 10^{-1}$	$4.1\ 10^{0}$	$3.7\ 10^{-1}$	$3.4\ 10^{-2}$	$1.0\ 10^{1}$	$2.5\ 10^{-4}$	$4.5\ 10^{-5}$	$3.3\ 10^{-2}$	$9.8\ 10^{5}$	$5.6\ 10^{2}$	$9.8\ 10^{5}$
^{241}Pu	$3.6\ 10^{0}$	$1.6\ 10^{-4}$	$1.7\ 10^{-2}$	$1.0\ 10^{-1}$	$3.2\ 10^{-3}$	$7.6\ 10^{-2}$	$6.9\ 10^{-3}$	$6.2\ 10^{-4}$	$1.9\ 10^{-1}$	$1.0\ 10^{-8}$	$4.1\ 10^{-7}$	$5.6\ 10^{-3}$	$1.7\ 10^{4}$	$9.7\ 10^{0}$	$1.7\ 10^{4}$
^{241}Am	$1.6\ 10^{2}$	$1.1\ 10^{-2}$	$7.7\ 10^{-1}$	$4.6\ 10^{0}$	$1.4\ 10^{-1}$	$3.3\ 10^{0}$	$3.1\ 10^{-1}$	$2.9\ 10^{-2}$	$8.3\ 10^{0}$	$9.0\ 10^{-6}$	$6.1\ 10^{-3}$	$6.9\ 10^{0}$	$8.2\ 10^{5}$	$4.7\ 10^{2}$	$8.2\ 10^{5}$
^{242}Cm	$1.6\ 10^{1}$	$2.4\ 10^{-4}$	$3.8\ 10^{-2}$	$2.3\ 10^{-1}$	$8.8\ 10^{-3}$	$2.1\ 10^{-1}$	$1.5\ 10^{-2}$	$1.7\ 10^{-3}$	$8.4\ 10^{-1}$	$2.9\ 10^{-10}$	$1.1\ 10^{-4}$	$3.8\ 10^{-3}$	$1.5\ 10^{5}$	$7.2\ 10^{1}$	$1.5\ 10^{5}$
^{244}Cm	$9.9\ 10^{1}$	$2.7\ 10^{-3}$	$4.7\ 10^{-1}$	$2.9\ 10^{0}$	$8.8\ 10^{-2}$	$2.1\ 10^{0}$	$1.9\ 10^{-1}$	$1.7\ 10^{-2}$	$5.2\ 10^{0}$	-	$1.3\ 10^{-4}$	$1.4\ 10^{-2}$	$6.2\ 10^{5}$	$3.5\ 10^{2}$	$6.2\ 10^{5}$

Table A29 Child annual doses per unit release (1 TBq) for a cautious (Cat D) short-term release assessment (scenario 2b) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$4.1\ 10^{-1}$	$6.1\ 10^{-1}$	$7.2\ 10^{-3}$	$3.6\ 10^{-4}$	$1.6\ 10^{-3}$	$5.3\ 10^{-4}$	$1.9\ 10^{-1}$	$5.6\ 10^{-3}$	$2.0\ 10^{-1}$	-	-	-	$6.5\ 10^{-1}$	-	$2.1\ 10^{0}$
^{14}C	$1.2\ 10^{1}$	$2.0\ 10^{1}$	$4.7\ 10^{0}$	$2.3\ 10^{-1}$	$1.3\ 10^{0}$	$4.5\ 10^{-1}$	$2.7\ 10^{1}$	$1.1\ 10^{1}$	$7.8\ 10^{0}$	$8.0\ 10^{-4}$	-	-	$4.8\ 10^{1}$	-	$1.3\ 10^{2}$
^{35}S	$1.2\ 10^{1}$	$1.1\ 10^{1}$	$1.7\ 10^{1}$	$8.7\ 10^{-1}$	$6.7\ 10^{0}$	$1.2\ 10^{0}$	$9.1\ 10^{1}$	$6.8\ 10^{1}$	$7.2\ 10^{0}$	$2.6\ 10^{-3}$	-	-	$5.0\ 10^{1}$	$1.1\ 10^{-2}$	$2.7\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$2.8\ 10^{-2}$	$7.8\ 10^{-1}$	-	-	-	$8.1\ 10^{-1}$
^{60}Co	$5.3\ 10^{2}$	$6.4\ 10^{-1}$	$3.6\ 10^{0}$	$1.8\ 10^{1}$	$4.8\ 10^{-1}$	$1.6\ 10^{1}$	$3.0\ 10^{2}$	$2.2\ 10^{2}$	$1.4\ 10^{1}$	$4.9\ 10^{-3}$	$1.5\ 10^{0}$	$2.6\ 10^{3}$	$3.9\ 10^{2}$	$3.1\ 10^{-2}$	$4.1\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$1.4\ 10^{-2}$	$1.3\ 10^{-3}$	-	-	-	$1.6\ 10^{-2}$
^{90}Sr	$3.1\ 10^{3}$	$1.1\ 10^{1}$	$8.5\ 10^{0}$	$4.3\ 10^{-1}$	$9.8\ 10^{-1}$	$3.3\ 10^{-1}$	$8.8\ 10^{2}$	$6.6\ 10^{2}$	$8.3\ 10^{1}$	$1.1\ 10^{-2}$	$3.2\ 10^{-11}$	$5.7\ 10^{-5}$	$1.3\ 10^{3}$	$1.1\ 10^{-1}$	$6.1\ 10^{3}$
^{106}Ru	$5.6\ 10^{2}$	$2.8\ 10^{-1}$	$2.9\ 10^{0}$	$1.5\ 10^{-1}$	$4.3\ 10^{-1}$	$1.4\ 10^{-1}$	$1.7\ 10^{-1}$	$1.3\ 10^{-1}$	$1.1\ 10^{1}$	$7.5\ 10^{-2}$	$8.2\ 10^{-2}$	$1.7\ 10^{2}$	$1.0\ 10^{3}$	$1.0\ 10^{0}$	$1.8\ 10^{3}$
^{125}Sb	$9.6\ 10^{1}$	$1.1\ 10^{-1}$	$1.2\ 10^{0}$	$6.1\ 10^{0}$	$1.7\ 10^{-1}$	$5.7\ 10^{0}$	$2.8\ 10^{0}$	$2.1\ 10^{0}$	$2.5\ 10^{0}$	$5.3\ 10^{-3}$	$2.5\ 10^{-1}$	$4.2\ 10^{2}$	$1.8\ 10^{2}$	$1.4\ 10^{-2}$	$7.1\ 10^{2}$
^{129}I	$2.4\ 10^{4}$	$1.4\ 10^{4}$	$1.0\ 10^{3}$	$5.2\ 10^{1}$	$2.1\ 10^{2}$	$7.0\ 10^{1}$	$3.4\ 10^{4}$	$2.5\ 10^{4}$	$1.6\ 10^{4}$	$5.9\ 10^{-4}$	$1.2\ 10^{-2}$	$3.7\ 10^{1}$	$1.5\ 10^{3}$	$1.1\ 10^{0}$	$1.2\ 10^{5}$
^{131}I	$2.2\ 10^{2}$	$2.7\ 10^{1}$	$2.5\ 10^{1}$	$1.5\ 10^{0}$	$5.7\ 10^{0}$	$1.9\ 10^{0}$	$1.6\ 10^{3}$	$1.0\ 10^{3}$	$3.6\ 10^{1}$	$1.1\ 10^{-2}$	$2.0\ 10^{-1}$	$7.4\ 10^{1}$	$4.3\ 10^{2}$	$1.1\ 10^{-1}$	$3.5\ 10^{3}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$6.0\ 10^{-3}$	$3.5\ 10^{-2}$	-	-	-	$4.1\ 10^{-2}$
^{137}Cs	$5.1\ 10^{2}$	$2.9\ 10^{2}$	$1.6\ 10^{2}$	$8.0\ 10^{0}$	$2.1\ 10^{1}$	$6.9\ 10^{0}$	$7.1\ 10^{2}$	$1.7\ 10^{2}$	$3.5\ 10^{2}$	$1.5\ 10^{-2}$	$6.3\ 10^{-2}$	$6.5\ 10^{2}$	$9.8\ 10^{1}$	$1.0\ 10^{-1}$	$3.0\ 10^{3}$
^{239}Pu	$1.4\ 10^{4}$	$3.9\ 10^{-2}$	$3.9\ 10^{0}$	$2.4\ 10^{1}$	$6.8\ 10^{-1}$	$1.6\ 10^{1}$	$1.6\ 10^{0}$	$1.2\ 10^{0}$	$2.7\ 10^{2}$	$3.1\ 10^{-4}$	$1.4\ 10^{-4}$	$8.2\ 10^{-2}$	$1.3\ 10^{6}$	$1.3\ 10^{3}$	$1.3\ 10^{6}$
^{241}Pu	$2.6\ 10^{2}$	$7.1\ 10^{-4}$	$7.2\ 10^{-2}$	$4.3\ 10^{-1}$	$1.3\ 10^{-2}$	$3.0\ 10^{-1}$	$2.9\ 10^{-2}$	$2.2\ 10^{-2}$	$4.9\ 10^{0}$	$1.3\ 10^{-8}$	$1.4\ 10^{-6}$	$1.4\ 10^{-2}$	$2.2\ 10^{4}$	$2.3\ 10^{1}$	$2.2\ 10^{4}$
^{241}Am	$1.1\ 10^{4}$	$5.1\ 10^{-2}$	$3.2\ 10^{0}$	$1.9\ 10^{1}$	$5.5\ 10^{-1}$	$1.3\ 10^{1}$	$1.3\ 10^{0}$	$9.6\ 10^{-1}$	$2.2\ 10^{2}$	$1.1\ 10^{-5}$	$2.0\ 10^{-2}$	$1.7\ 10^{1}$	$1.1\ 10^{6}$	$1.1\ 10^{3}$	$1.1\ 10^{6}$
^{242}Cm	$6.3\ 10^{2}$	$8.7\ 10^{-4}$	$1.6\ 10^{-1}$	$9.4\ 10^{-1}$	$3.5\ 10^{-2}$	$8.1\ 10^{-1}$	$6.4\ 10^{-2}$	$4.7\ 10^{-2}$	$1.2\ 10^{1}$	$3.6\ 10^{-10}$	$3.4\ 10^{-4}$	$3.8\ 10^{-3}$	$1.9\ 10^{5}$	$1.7\ 10^{2}$	$1.9\ 10^{5}$
^{244}Cm	$7.1\ 10^{3}$	$1.2\ 10^{-2}$	$2.0\ 10^{0}$	$1.2\ 10^{1}$	$3.5\ 10^{-1}$	$8.2\ 10^{0}$	$7.9\ 10^{-1}$	$5.9\ 10^{-1}$	$1.4\ 10^{2}$	-	$4.1\ 10^{-4}$	$1.4\ 10^{-2}$	$8.0\ 10^{5}$	$8.6\ 10^{2}$	$8.1\ 10^{5}$

Table A30 Child annual doses per unit release (1 TBq) for a cautious (Cat F) short-term release assessment (scenario 2c) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$1.4\ 10^{0}$	$2.1\ 10^{0}$	$2.3\ 10^{-2}$	$1.2\ 10^{-3}$	$5.2\ 10^{-3}$	$1.7\ 10^{-3}$	$5.9\ 10^{-1}$	$1.8\ 10^{-2}$	$7.0\ 10^{-1}$	-	-	-	$1.6\ 10^{0}$	-	$6.5\ 10^{0}$
^{14}C	$5.1\ 10^{1}$	$8.5\ 10^{1}$	$2.0\ 10^{1}$	$1.0\ 10^{0}$	$5.9\ 10^{0}$	$2.0\ 10^{0}$	$1.1\ 10^{2}$	$4.7\ 10^{1}$	$3.4\ 10^{1}$	$2.5\ 10^{-3}$	-	-	$1.6\ 10^{2}$	-	$5.2\ 10^{2}$
^{35}S	$4.4\ 10^{1}$	$3.7\ 10^{1}$	$2.6\ 10^{1}$	$1.3\ 10^{0}$	$1.1\ 10^{1}$	$2.6\ 10^{0}$	$2.0\ 10^{2}$	$1.5\ 10^{2}$	$2.6\ 10^{1}$	$7.2\ 10^{-3}$	-	-	$1.4\ 10^{2}$	$1.1\ 10^{-2}$	$6.5\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$8.7\ 10^{-2}$	$2.0\ 10^{0}$	-	-	-	$2.1\ 10^{0}$
^{60}Co	$4.8\ 10^{2}$	$5.8\ 10^{-1}$	$3.3\ 10^{0}$	$1.6\ 10^{1}$	$4.4\ 10^{-1}$	$1.5\ 10^{1}$	$2.7\ 10^{2}$	$2.0\ 10^{2}$	$1.3\ 10^{1}$	$1.5\ 10^{-2}$	$3.7\ 10^{0}$	$4.1\ 10^{3}$	$1.2\ 10^{3}$	$3.1\ 10^{-2}$	$6.4\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$4.5\ 10^{-2}$	$3.3\ 10^{-3}$	-	-	-	$4.8\ 10^{-2}$
^{90}Sr	$2.8\ 10^{3}$	$9.6\ 10^{0}$	$7.8\ 10^{0}$	$3.9\ 10^{-1}$	$9.0\ 10^{-1}$	$3.0\ 10^{-1}$	$8.0\ 10^{2}$	$6.0\ 10^{2}$	$7.5\ 10^{1}$	$3.3\ 10^{-2}$	$2.1\ 10^{-10}$	$8.9\ 10^{-5}$	$4.2\ 10^{3}$	$1.1\ 10^{-1}$	$8.5\ 10^{3}$
^{106}Ru	$5.1\ 10^{2}$	$2.5\ 10^{-1}$	$2.6\ 10^{0}$	$1.3\ 10^{-1}$	$3.9\ 10^{-1}$	$1.3\ 10^{-1}$	$1.6\ 10^{-1}$	$1.2\ 10^{-1}$	$9.8\ 10^{0}$	$2.4\ 10^{-1}$	$2.8\ 10^{-1}$	$2.7\ 10^{2}$	$3.3\ 10^{3}$	$1.6\ 10^{0}$	$4.1\ 10^{3}$
^{125}Sb	$8.7\ 10^{1}$	$1.0\ 10^{-1}$	$1.1\ 10^{0}$	$5.5\ 10^{0}$	$1.5\ 10^{-1}$	$5.2\ 10^{0}$	$2.5\ 10^{0}$	$1.9\ 10^{0}$	$2.2\ 10^{0}$	$1.6\ 10^{-2}$	$6.1\ 10^{-1}$	$6.6\ 10^{2}$	$5.6\ 10^{2}$	$1.4\ 10^{-2}$	$1.3\ 10^{3}$
^{129}I	$4.8\ 10^{4}$	$2.8\ 10^{4}$	$2.1\ 10^{3}$	$1.0\ 10^{2}$	$4.0\ 10^{2}$	$1.3\ 10^{2}$	$6.7\ 10^{4}$	$5.0\ 10^{4}$	$3.3\ 10^{4}$	$1.4\ 10^{-3}$	$2.7\ 10^{-2}$	$8.2\ 10^{1}$	$3.7\ 10^{3}$	$1.1\ 10^{0}$	$2.3\ 10^{5}$
^{131}I	$4.4\ 10^{2}$	$4.8\ 10^{1}$	$4.7\ 10^{1}$	$2.8\ 10^{0}$	$1.1\ 10^{1}$	$3.6\ 10^{0}$	$3.2\ 10^{3}$	$2.0\ 10^{3}$	$6.5\ 10^{1}$	$2.5\ 10^{-2}$	$4.4\ 10^{-1}$	$1.6\ 10^{2}$	$1.0\ 10^{3}$	$1.1\ 10^{-1}$	$6.9\ 10^{3}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$1.9\ 10^{-2}$	$8.8\ 10^{-2}$	-	-	-	$1.1\ 10^{-1}$
^{137}Cs	$4.6\ 10^{2}$	$2.6\ 10^{2}$	$1.5\ 10^{2}$	$7.3\ 10^{0}$	$1.9\ 10^{1}$	$6.3\ 10^{0}$	$6.4\ 10^{2}$	$1.6\ 10^{2}$	$3.1\ 10^{2}$	$4.5\ 10^{-2}$	$2.9\ 10^{-1}$	$1.0\ 10^{3}$	$3.0\ 10^{2}$	$1.6\ 10^{-1}$	$3.3\ 10^{3}$
^{239}Pu	$1.3\ 10^{4}$	$3.5\ 10^{-2}$	$3.5\ 10^{0}$	$2.1\ 10^{1}$	$6.2\ 10^{-1}$	$1.5\ 10^{1}$	$1.4\ 10^{0}$	$1.1\ 10^{0}$	$2.4\ 10^{2}$	$9.5\ 10^{-4}$	$4.0\ 10^{-4}$	$1.3\ 10^{-1}$	$3.9\ 10^{6}$	$2.1\ 10^{3}$	$4.0\ 10^{6}$
^{241}Pu	$2.3\ 10^{2}$	$6.5\ 10^{-4}$	$6.5\ 10^{-2}$	$3.9\ 10^{-1}$	$1.1\ 10^{-2}$	$2.7\ 10^{-1}$	$2.6\ 10^{-2}$	$2.0\ 10^{-2}$	$4.5\ 10^{0}$	$4.0\ 10^{-8}$	$3.5\ 10^{-6}$	$2.3\ 10^{-2}$	$6.8\ 10^{4}$	$3.6\ 10^{1}$	$6.9\ 10^{4}$
^{241}Am	$1.0\ 10^{4}$	$4.6\ 10^{-2}$	$2.9\ 10^{0}$	$1.7\ 10^{1}$	$5.0\ 10^{-1}$	$1.2\ 10^{1}$	$1.2\ 10^{0}$	$8.7\ 10^{-1}$	$2.0\ 10^{2}$	$3.5\ 10^{-5}$	$5.0\ 10^{-2}$	$2.7\ 10^{1}$	$3.3\ 10^{6}$	$1.7\ 10^{3}$	$3.3\ 10^{6}$
^{242}Cm	$5.7\ 10^{2}$	$7.9\ 10^{-4}$	$1.4\ 10^{-1}$	$8.6\ 10^{-1}$	$3.2\ 10^{-2}$	$7.3\ 10^{-1}$	$5.8\ 10^{-2}$	$4.3\ 10^{-2}$	$1.1\ 10^{1}$	$1.1\ 10^{-9}$	$9.9\ 10^{-4}$	$3.8\ 10^{-3}$	$6.0\ 10^{5}$	$2.7\ 10^{2}$	$6.0\ 10^{5}$
^{244}Cm	$6.4\ 10^{3}$	$1.1\ 10^{-2}$	$1.8\ 10^{0}$	$1.1\ 10^{1}$	$3.2\ 10^{-1}$	$7.4\ 10^{0}$	$7.2\ 10^{-1}$	$5.4\ 10^{-1}$	$1.2\ 10^{2}$	-	$1.2\ 10^{-3}$	$1.4\ 10^{-2}$	$2.5\ 10^{6}$	$1.3\ 10^{3}$	$2.5\ 10^{6}$

Table A31 Child annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 3a) (μSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$1.3\ 10^{-2}$	$1.9\ 10^{-2}$	$2.1\ 10^{-3}$	$1.1\ 10^{-4}$	$4.2\ 10^{-4}$	$1.4\ 10^{-4}$	$5.8\ 10^{-2}$	$8.2\ 10^{-4}$	$6.1\ 10^{-3}$	-	-	-	$3.1\ 10^{-1}$	-	$4.1\ 10^{-1}$
^{14}C	$5.5\ 10^{-1}$	$1.4\ 10^{0}$	$7.2\ 10^{-1}$	$3.6\ 10^{-2}$	$1.7\ 10^{-1}$	$5.6\ 10^{-2}$	$4.6\ 10^{0}$	$9.2\ 10^{-1}$	$4.3\ 10^{-1}$	$3.2\ 10^{-4}$	-	-	$1.8\ 10^{1}$	-	$2.6\ 10^{1}$
^{35}S	$1.7\ 10^{0}$	$2.1\ 10^{0}$	$1.8\ 10^{1}$	$8.8\ 10^{-1}$	$6.4\ 10^{0}$	$8.8\ 10^{-1}$	$6.4\ 10^{1}$	$4.5\ 10^{1}$	$7.3\ 10^{-1}$	$1.0\ 10^{-3}$	-	-	$1.8\ 10^{1}$	$1.3\ 10^{-2}$	$1.6\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$1.1\ 10^{-2}$	$1.1\ 10^{-1}$	-	-	-	$1.2\ 10^{-1}$
^{60}Co	$4.3\ 10^{0}$	$5.3\ 10^{-2}$	$3.7\ 10^{-1}$	$1.9\ 10^{0}$	$6.2\ 10^{-2}$	$2.1\ 10^{0}$	$2.9\ 10^{1}$	$6.2\ 10^{0}$	$8.1\ 10^{-1}$	$1.9\ 10^{-3}$	$2.2\ 10^{-1}$	$4.6\ 10^{2}$	$1.4\ 10^{2}$	$3.8\ 10^{-2}$	$6.5\ 10^{2}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$5.7\ 10^{-3}$	$2.1\ 10^{-4}$	-	-	-	$5.9\ 10^{-3}$
^{90}Sr	$2.6\ 10^{1}$	$9.3\ 10^{-1}$	$9.2\ 10^{-1}$	$4.5\ 10^{-2}$	$1.3\ 10^{-1}$	$4.3\ 10^{-2}$	$9.5\ 10^{1}$	$2.5\ 10^{1}$	$4.8\ 10^{0}$	$4.4\ 10^{-3}$	$2.8\ 10^{-12}$	$1.0\ 10^{-5}$	$4.9\ 10^{2}$	$1.3\ 10^{-1}$	$6.5\ 10^{2}$
^{106}Ru	$5.4\ 10^{0}$	$3.0\ 10^{-2}$	$3.1\ 10^{-1}$	$1.6\ 10^{-2}$	$5.5\ 10^{-2}$	$1.8\ 10^{-2}$	$1.8\ 10^{-2}$	$4.1\ 10^{-3}$	$2.8\ 10^{-1}$	$2.7\ 10^{-2}$	$1.3\ 10^{-2}$	$3.1\ 10^{1}$	$3.5\ 10^{2}$	$2.1\ 10^{-1}$	$3.9\ 10^{2}$
^{125}Sb	$8.1\ 10^{-1}$	$9.7\ 10^{-3}$	$1.2\ 10^{-1}$	$6.0\ 10^{-1}$	$2.2\ 10^{-2}$	$7.4\ 10^{-1}$	$2.7\ 10^{-1}$	$6.0\ 10^{-2}$	$1.5\ 10^{-1}$	$2.1\ 10^{-3}$	$3.9\ 10^{-2}$	$7.5\ 10^{1}$	$6.6\ 10^{1}$	$1.7\ 10^{-2}$	$1.4\ 10^{2}$
^{129}I	$5.0\ 10^{2}$	$1.3\ 10^{3}$	$2.2\ 10^{2}$	$1.1\ 10^{1}$	$5.8\ 10^{1}$	$1.9\ 10^{1}$	$7.0\ 10^{3}$	$1.8\ 10^{3}$	$1.1\ 10^{3}$	$2.3\ 10^{-4}$	$1.9\ 10^{-3}$	$1.0\ 10^{1}$	$5.5\ 10^{2}$	$1.4\ 10^{0}$	$1.3\ 10^{4}$
^{131}I	$4.3\ 10^{1}$	$1.5\ 10^{1}$	$7.2\ 10^{0}$	$4.2\ 10^{-1}$	$1.6\ 10^{0}$	$5.4\ 10^{-1}$	$4.6\ 10^{2}$	$1.6\ 10^{2}$	$3.2\ 10^{1}$	$4.2\ 10^{-3}$	$3.2\ 10^{-2}$	$2.4\ 10^{1}$	$1.6\ 10^{2}$	$1.3\ 10^{-1}$	$8.9\ 10^{2}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$2.4\ 10^{-3}$	$5.3\ 10^{-3}$	-	-	-	$7.8\ 10^{-3}$
^{137}Cs	$4.6\ 10^{0}$	$1.2\ 10^{1}$	$1.6\ 10^{1}$	$8.0\ 10^{-1}$	$2.7\ 10^{0}$	$9.0\ 10^{-1}$	$6.9\ 10^{1}$	$1.5\ 10^{1}$	$1.2\ 10^{1}$	$6.0\ 10^{-3}$	$9.8\ 10^{-3}$	$1.1\ 10^{2}$	$3.6\ 10^{1}$	$2.1\ 10^{-2}$	$2.8\ 10^{2}$
^{239}Pu	$1.0\ 10^{2}$	$3.5\ 10^{-3}$	$4.1\ 10^{-1}$	$2.5\ 10^{0}$	$8.8\ 10^{-2}$	$2.1\ 10^{0}$	$1.6\ 10^{-1}$	$4.1\ 10^{-2}$	$4.9\ 10^{0}$	$1.3\ 10^{-4}$	$2.3\ 10^{-5}$	$1.4\ 10^{-2}$	$4.6\ 10^{5}$	$2.7\ 10^{2}$	$4.6\ 10^{5}$
^{241}Pu	$1.9\ 10^{0}$	$6.5\ 10^{-5}$	$7.6\ 10^{-3}$	$4.6\ 10^{-2}$	$1.6\ 10^{-3}$	$3.9\ 10^{-2}$	$3.0\ 10^{-3}$	$7.6\ 10^{-4}$	$9.3\ 10^{-2}$	$5.3\ 10^{-9}$	$2.1\ 10^{-7}$	$2.3\ 10^{-3}$	$8.0\ 10^{3}$	$4.8\ 10^{0}$	$8.0\ 10^{3}$
^{241}Am	$8.1\ 10^{1}$	$4.6\ 10^{-3}$	$3.4\ 10^{-1}$	$2.0\ 10^{0}$	$7.2\ 10^{-2}$	$1.7\ 10^{0}$	$1.4\ 10^{-1}$	$3.5\ 10^{-2}$	$4.0\ 10^{0}$	$4.6\ 10^{-6}$	$3.1\ 10^{-3}$	$3.0\ 10^{0}$	$3.9\ 10^{5}$	$2.3\ 10^{2}$	$3.9\ 10^{5}$
^{242}Cm	$8.2\ 10^{0}$	$1.1\ 10^{-4}$	$1.8\ 10^{-2}$	$1.1\ 10^{-1}$	$4.5\ 10^{-3}$	$1.0\ 10^{-1}$	$7.1\ 10^{-3}$	$2.0\ 10^{-3}$	$4.1\ 10^{-1}$	$1.5\ 10^{-10}$	$5.4\ 10^{-5}$	$4.7\ 10^{-3}$	$7.0\ 10^{4}$	$3.5\ 10^{1}$	$7.0\ 10^{4}$
^{244}Cm	$5.2\ 10^{1}$	$1.1\ 10^{-3}$	$2.1\ 10^{-1}$	$1.3\ 10^{0}$	$4.5\ 10^{-2}$	$1.1\ 10^{0}$	$8.4\ 10^{-2}$	$2.1\ 10^{-2}$	$2.5\ 10^{0}$	-	$6.6\ 10^{-5}$	$1.7\ 10^{-2}$	$2.8\ 10^{5}$	$1.7\ 10^{2}$	$2.8\ 10^{5}$

Table A32 Child annual doses per unit release (1 TBq) for a cautious (Cat D) short-term release assessment (scenario 3b) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$1.4\ 10^{-1}$	$2.1\ 10^{-1}$	$3.1\ 10^{-3}$	$1.6\ 10^{-4}$	$6.4\ 10^{-4}$	$2.1\ 10^{-4}$	$8.2\ 10^{-2}$	$2.5\ 10^{-3}$	$6.9\ 10^{-2}$	-	-	-	$3.5\ 10^{-1}$	-	$8.5\ 10^{-1}$
^{14}C	$4.1\ 10^{0}$	$7.2\ 10^{0}$	$1.8\ 10^{0}$	$8.9\ 10^{-2}$	$4.8\ 10^{-1}$	$1.6\ 10^{-1}$	$1.1\ 10^{1}$	$4.3\ 10^{0}$	$2.8\ 10^{0}$	$3.8\ 10^{-4}$	-	-	$2.1\ 10^{1}$	-	$5.3\ 10^{1}$
^{35}S	$4.9\ 10^{0}$	$4.7\ 10^{0}$	$1.8\ 10^{1}$	$9.2\ 10^{-1}$	$6.8\ 10^{0}$	$1.0\ 10^{0}$	$7.4\ 10^{1}$	$5.5\ 10^{1}$	$2.6\ 10^{0}$	$1.2\ 10^{-3}$	-	-	$2.2\ 10^{1}$	$1.3\ 10^{-2}$	$1.9\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$1.3\ 10^{-2}$	$3.0\ 10^{-1}$	-	-	-	$3.1\ 10^{-1}$
^{60}Co	$1.8\ 10^{2}$	$2.2\ 10^{-1}$	$1.3\ 10^{0}$	$6.5\ 10^{0}$	$1.8\ 10^{-1}$	$6.1\ 10^{0}$	$1.1\ 10^{2}$	$7.9\ 10^{1}$	$4.7\ 10^{0}$	$2.3\ 10^{-3}$	$5.7\ 10^{-1}$	$9.8\ 10^{2}$	$1.7\ 10^{2}$	$3.8\ 10^{-2}$	$1.5\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$6.8\ 10^{-3}$	$5.1\ 10^{-4}$	-	-	-	$7.3\ 10^{-3}$
^{90}Sr	$1.0\ 10^{3}$	$3.7\ 10^{0}$	$3.1\ 10^{0}$	$1.5\ 10^{-1}$	$3.7\ 10^{-1}$	$1.2\ 10^{-1}$	$3.2\ 10^{2}$	$2.4\ 10^{2}$	$2.8\ 10^{1}$	$5.2\ 10^{-3}$	$1.1\ 10^{-11}$	$2.1\ 10^{-5}$	$5.9\ 10^{2}$	$1.3\ 10^{-1}$	$2.2\ 10^{3}$
^{106}Ru	$1.9\ 10^{2}$	$9.9\ 10^{-2}$	$1.1\ 10^{0}$	$5.3\ 10^{-2}$	$1.6\ 10^{-1}$	$5.4\ 10^{-2}$	$6.1\ 10^{-2}$	$4.6\ 10^{-2}$	$3.7\ 10^{0}$	$3.3\ 10^{-2}$	$3.1\ 10^{-2}$	$6.6\ 10^{1}$	$4.4\ 10^{2}$	$4.2\ 10^{-1}$	$7.0\ 10^{2}$
^{125}Sb	$3.2\ 10^{1}$	$3.9\ 10^{-2}$	$4.3\ 10^{-1}$	$2.1\ 10^{0}$	$6.4\ 10^{-2}$	$2.1\ 10^{0}$	$9.8\ 10^{-1}$	$7.3\ 10^{-1}$	$8.5\ 10^{-1}$	$2.5\ 10^{-3}$	$9.6\ 10^{-2}$	$1.6\ 10^{2}$	$7.9\ 10^{1}$	$1.7\ 10^{-2}$	$2.8\ 10^{2}$
^{129}I	$8.1\ 10^{3}$	$4.9\ 10^{3}$	$4.0\ 10^{2}$	$2.0\ 10^{1}$	$9.3\ 10^{1}$	$3.1\ 10^{1}$	$1.3\ 10^{4}$	$9.8\ 10^{3}$	$5.4\ 10^{3}$	$2.8\ 10^{-4}$	$4.7\ 10^{-3}$	$1.5\ 10^{1}$	$6.6\ 10^{2}$	$1.4\ 10^{0}$	$4.2\ 10^{4}$
^{131}I	$9.2\ 10^{1}$	$1.5\ 10^{1}$	$1.1\ 10^{1}$	$6.6\ 10^{-1}$	$2.6\ 10^{0}$	$8.5\ 10^{-1}$	$7.3\ 10^{2}$	$4.6\ 10^{2}$	$1.8\ 10^{1}$	$5.0\ 10^{-3}$	$7.9\ 10^{-2}$	$3.3\ 10^{1}$	$1.9\ 10^{2}$	$1.3\ 10^{-1}$	$1.5\ 10^{3}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$2.9\ 10^{-3}$	$1.4\ 10^{-2}$	-	-	-	$1.6\ 10^{-2}$
^{137}Cs	$1.7\ 10^{2}$	$1.0\ 10^{2}$	$5.7\ 10^{1}$	$2.8\ 10^{0}$	$7.9\ 10^{0}$	$2.6\ 10^{0}$	$2.5\ 10^{2}$	$6.8\ 10^{1}$	$1.2\ 10^{2}$	$7.1\ 10^{-3}$	$2.4\ 10^{-2}$	$2.4\ 10^{2}$	$4.3\ 10^{1}$	$4.1\ 10^{-2}$	$1.1\ 10^{3}$
^{239}Pu	$4.7\ 10^{3}$	$1.4\ 10^{-2}$	$1.4\ 10^{0}$	$8.5\ 10^{0}$	$2.6\ 10^{-1}$	$6.1\ 10^{0}$	$5.6\ 10^{-1}$	$4.2\ 10^{-1}$	$9.1\ 10^{1}$	$1.5\ 10^{-4}$	$5.6\ 10^{-5}$	$3.1\ 10^{-2}$	$5.5\ 10^{5}$	$5.3\ 10^{2}$	$5.6\ 10^{5}$
^{241}Pu	$8.6\ 10^{1}$	$2.5\ 10^{-4}$	$2.6\ 10^{-2}$	$1.6\ 10^{-1}$	$4.7\ 10^{-3}$	$1.1\ 10^{-1}$	$1.0\ 10^{-2}$	$7.7\ 10^{-3}$	$1.7\ 10^{0}$	$6.3\ 10^{-9}$	$5.4\ 10^{-7}$	$5.2\ 10^{-3}$	$9.6\ 10^{3}$	$9.2\ 10^{0}$	$9.7\ 10^{3}$
^{241}Am	$3.8\ 10^{3}$	$1.8\ 10^{-2}$	$1.1\ 10^{0}$	$6.9\ 10^{0}$	$2.1\ 10^{-1}$	$4.9\ 10^{0}$	$4.6\ 10^{-1}$	$3.4\ 10^{-1}$	$7.4\ 10^{1}$	$5.4\ 10^{-6}$	$7.7\ 10^{-3}$	$6.4\ 10^{0}$	$4.6\ 10^{5}$	$4.5\ 10^{2}$	$4.7\ 10^{5}$
^{242}Cm	$2.1\ 10^{2}$	$3.1\ 10^{-4}$	$5.7\ 10^{-2}$	$3.4\ 10^{-1}$	$1.3\ 10^{-2}$	$3.0\ 10^{-1}$	$2.3\ 10^{-2}$	$1.7\ 10^{-2}$	$4.2\ 10^{0}$	$1.7\ 10^{-10}$	$1.3\ 10^{-4}$	$4.7\ 10^{-3}$	$8.5\ 10^{4}$	$6.9\ 10^{1}$	$8.5\ 10^{4}$
^{244}Cm	$2.4\ 10^{3}$	$4.1\ 10^{-3}$	$7.1\ 10^{-1}$	$4.3\ 10^{0}$	$1.3\ 10^{-1}$	$3.1\ 10^{0}$	$2.9\ 10^{-1}$	$2.1\ 10^{-1}$	$4.6\ 10^{1}$	-	$1.6\ 10^{-4}$	$1.7\ 10^{-2}$	$3.4\ 10^{5}$	$3.4\ 10^{2}$	$3.4\ 10^{5}$

Table A33 Child annual doses per unit release (1 TBq) for a cautious (Cat F) short-term release assessment (scenario 3c) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	4.7 10^{-1}	7.0 10^{-1}	8.4 10^{-3}	4.2 10^{-4}	1.8 10^{-3}	6.1 10^{-4}	2.2 10^{-1}	6.5 10^{-3}	2.3 10^{-1}	-	-	-	6.8 10^{-1}	-	2.3 10^{0}
^{14}C	1.7 10^{1}	2.9 10^{1}	6.9 10^{0}	3.5 10^{-1}	2.0 10^{0}	6.7 10^{-1}	4.0 10^{1}	1.6 10^{1}	1.2 10^{1}	9.4 10^{-4}	-	-	5.7 10^{1}	-	1.8 10^{2}
^{35}S	1.5 10^{1}	1.3 10^{1}	2.1 10^{1}	1.1 10^{0}	8.2 10^{0}	1.5 10^{0}	1.1 10^{2}	8.3 10^{1}	8.8 10^{0}	2.8 10^{-3}	-	-	5.3 10^{1}	1.3 10^{-2}	3.2 10^{2}
^{41}Ar	-	-	-	-	-	-	-	-	-	3.3 10^{-2}	7.0 10^{-1}	-	-	-	7.3 10^{-1}
^{60}Co	1.6 10^{2}	2.0 10^{-1}	1.2 10^{0}	5.9 10^{0}	1.7 10^{-1}	5.6 10^{0}	9.7 10^{1}	7.2 10^{1}	4.3 10^{0}	5.6 10^{-3}	1.3 10^{0}	1.5 10^{3}	4.5 10^{2}	3.8 10^{-2}	2.3 10^{3}
^{85}Kr	-	-	-	-	-	-	-	-	-	1.7 10^{-2}	1.2 10^{-3}	-	-	-	1.8 10^{-2}
^{90}Sr	9.3 10^{2}	3.4 10^{0}	2.8 10^{0}	1.4 10^{-1}	3.4 10^{-1}	1.1 10^{-1}	2.9 10^{2}	2.2 10^{2}	2.6 10^{1}	1.3 10^{-2}	7.1 10^{-11}	3.2 10^{-5}	1.5 10^{3}	1.3 10^{-1}	3.0 10^{3}
^{106}Ru	1.7 10^{2}	9.0 10^{-2}	9.6 10^{-1}	4.8 10^{-2}	1.5 10^{-1}	5.0 10^{-2}	5.6 10^{-2}	4.2 10^{-2}	3.3 10^{0}	8.7 10^{-2}	9.8 10^{-2}	9.9 10^{1}	1.2 10^{3}	6.1 10^{-1}	1.5 10^{3}
^{125}Sb	2.9 10^{1}	3.6 10^{-2}	3.9 10^{-1}	2.0 10^{0}	5.9 10^{-2}	2.0 10^{0}	8.9 10^{-1}	6.7 10^{-1}	7.7 10^{-1}	6.1 10^{-3}	2.2 10^{-1}	2.4 10^{2}	2.1 10^{2}	1.7 10^{-2}	4.8 10^{2}
^{129}I	1.6 10^{4}	9.5 10^{3}	7.4 10^{2}	3.7 10^{1}	1.6 10^{2}	5.2 10^{1}	2.4 10^{4}	1.8 10^{4}	1.1 10^{4}	5.5 10^{-4}	9.6 10^{-3}	3.0 10^{1}	1.4 10^{3}	1.4 10^{0}	8.1 10^{4}
^{131}I	1.6 10^{2}	2.2 10^{1}	1.9 10^{1}	1.1 10^{0}	4.3 10^{0}	1.4 10^{0}	1.2 10^{3}	7.8 10^{2}	2.8 10^{1}	9.8 10^{-3}	1.6 10^{-1}	6.2 10^{1}	3.9 10^{2}	1.3 10^{-1}	2.7 10^{3}
^{133}Xe	-	-	-	-	-	-	-	-	-	7.1 10^{-3}	3.1 10^{-2}	-	-	-	3.8 10^{-2}
^{137}Cs	1.6 10^{2}	9.1 10^{1}	5.2 10^{1}	2.6 10^{0}	7.2 10^{0}	2.4 10^{0}	2.3 10^{2}	6.3 10^{1}	1.0 10^{2}	1.7 10^{-2}	1.0 10^{-1}	3.7 10^{2}	1.1 10^{2}	6.0 10^{-2}	1.2 10^{3}
^{239}Pu	4.2 10^{3}	1.2 10^{-2}	1.3 10^{0}	7.7 10^{0}	2.4 10^{-1}	5.6 10^{0}	5.1 10^{-1}	3.8 10^{-1}	8.2 10^{1}	3.6 10^{-4}	1.4 10^{-4}	4.7 10^{-2}	1.4 10^{6}	7.9 10^{2}	1.5 10^{6}
^{241}Pu	7.8 10^{1}	2.3 10^{-4}	2.4 10^{-2}	1.4 10^{-1}	4.4 10^{-3}	1.0 10^{-1}	9.4 10^{-3}	7.1 10^{-3}	1.5 10^{0}	1.5 10^{-8}	1.2 10^{-6}	8.0 10^{-3}	2.5 10^{4}	1.4 10^{1}	2.5 10^{4}
^{241}Am	3.5 10^{3}	1.6 10^{-2}	1.1 10^{0}	6.3 10^{0}	1.9 10^{-1}	4.5 10^{0}	4.2 10^{-1}	3.1 10^{-1}	6.7 10^{1}	1.3 10^{-5}	1.8 10^{-2}	9.7 10^{0}	1.2 10^{6}	6.6 10^{2}	1.2 10^{6}
^{242}Cm	1.9 10^{2}	2.9 10^{-4}	5.2 10^{-2}	3.1 10^{-1}	1.2 10^{-2}	2.8 10^{-1}	2.1 10^{-2}	1.6 10^{-2}	3.8 10^{0}	4.2 10^{-10}	3.5 10^{-4}	4.7 10^{-3}	2.2 10^{5}	1.0 10^{2}	2.2 10^{5}
^{244}Cm	2.2 10^{3}	3.8 10^{-3}	6.5 10^{-1}	3.9 10^{0}	1.2 10^{-1}	2.8 10^{0}	2.6 10^{-1}	2.0 10^{-1}	4.2 10^{1}	-	4.1 10^{-4}	1.7 10^{-2}	9.2 10^{5}	5.0 10^{2}	9.2 10^{5}

Table A34 Infant annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 2a) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	3.1 10^{-2}	2.1 10^{-2}	2.7 10^{-3}	1.8 10^{-4}	7.8 10^{-4}	2.6 10^{-4}	3.1 10^{-1}	1.4 10^{-3}	1.5 10^{-2}	-	-	-	3.8 10^{-1}	-	7.7 10^{-1}
^{14}C	9.6 10^{-1}	9.6 10^{-1}	8.8 10^{-1}	5.9 10^{-2}	3.2 10^{-1}	1.1 10^{-1}	2.3 10^{1}	1.5 10^{0}	6.1 10^{-1}	6.2 10^{-4}	-	-	3.0 10^{1}	-	5.9 10^{1}
^{35}S	5.0 10^{0}	2.8 10^{0}	1.5 10^{1}	1.0 10^{0}	7.5 10^{0}	1.1 10^{0}	2.7 10^{2}	1.3 10^{2}	2.7 10^{0}	2.0 10^{-3}	-	-	3.1 10^{1}	8.3 10^{-3}	4.6 10^{2}
^{41}Ar	-	-	-	-	-	-	-	-	-	2.2 10^{-2}	1.6 10^{-1}	-	-	-	1.9 10^{-1}
^{60}Co	1.0 10^{1}	7.5 10^{-2}	6.3 10^{-1}	4.2 10^{0}	1.2 10^{-1}	4.0 10^{0}	2.3 10^{2}	1.3 10^{1}	2.5 10^{0}	3.8 10^{-3}	3.2 10^{-1}	8.2 10^{2}	2.5 10^{2}	2.4 10^{-2}	1.3 10^{3}
^{85}Kr	-	-	-	-	-	-	-	-	-	1.1 10^{-2}	3.2 10^{-4}	-	-	-	1.2 10^{-2}
^{90}Sr	3.2 10^{1}	6.4 10^{-1}	7.5 10^{-1}	5.0 10^{-2}	1.2 10^{-1}	4.1 10^{-2}	3.4 10^{2}	2.5 10^{1}	7.5 10^{0}	8.5 10^{-3}	6.6 10^{-12}	1.8 10^{-5}	7.9 10^{2}	7.5 10^{-2}	1.2 10^{3}
^{106}Ru	1.7 10^{1}	5.3 10^{-2}	6.9 10^{-1}	4.6 10^{-2}	1.4 10^{-1}	4.7 10^{-2}	1.8 10^{-1}	1.1 10^{-2}	9.4 10^{-1}	5.8 10^{-2}	2.0 10^{-2}	5.5 10^{1}	7.6 10^{2}	4.6 10^{-1}	8.4 10^{2}
^{125}Sb	2.3 10^{0}	1.6 10^{-2}	2.5 10^{-1}	1.7 10^{0}	5.0 10^{-2}	1.7 10^{0}	2.5 10^{0}	1.4 10^{-1}	5.6 10^{-1}	4.2 10^{-3}	6.0 10^{-2}	1.3 10^{2}	1.2 10^{2}	1.1 10^{-2}	2.6 10^{2}
^{129}I	5.1 10^{2}	7.5 10^{2}	1.7 10^{2}	1.1 10^{1}	4.9 10^{1}	1.6 10^{1}	2.4 10^{4}	1.7 10^{3}	1.9 10^{3}	4.6 10^{-4}	2.9 10^{-3}	1.8 10^{1}	5.3 10^{2}	4.9 10^{-1}	3.0 10^{4}
^{131}I	1.3 10^{2}	2.1 10^{1}	1.3 10^{1}	1.0 10^{0}	4.0 10^{0}	1.3 10^{0}	3.8 10^{3}	4.4 10^{2}	1.3 10^{2}	8.3 10^{-3}	4.9 10^{-2}	3.7 10^{1}	4.5 10^{2}	1.4 10^{-1}	5.0 10^{3}
^{133}Xe	-	-	-	-	-	-	-	-	-	4.7 10^{-3}	8.1 10^{-3}	-	-	-	1.3 10^{-2}
^{137}Cs	5.3 10^{0}	8.1 10^{0}	1.4 10^{1}	9.1 10^{-1}	2.5 10^{0}	8.5 10^{-1}	2.6 10^{2}	1.4 10^{1}	2.1 10^{1}	1.2 10^{-2}	1.6 10^{-2}	2.0 10^{2}	3.9 10^{1}	2.5 10^{-2}	5.7 10^{2}
^{239}Pu	1.5 10^{2}	3.1 10^{-3}	4.4 10^{-1}	3.5 10^{0}	1.1 10^{-1}	2.5 10^{0}	7.6 10^{-1}	5.3 10^{-2}	7.9 10^{0}	2.5 10^{-4}	3.5 10^{-5}	2.6 10^{-2}	5.5 10^{5}	3.6 10^{2}	5.6 10^{5}
^{241}Pu	2.0 10^{0}	4.1 10^{-5}	5.8 10^{-3}	4.6 10^{-2}	1.4 10^{-3}	3.4 10^{-2}	1.0 10^{-2}	7.0 10^{-4}	1.1 10^{-1}	1.0 10^{-8}	3.2 10^{-7}	4.4 10^{-3}	7.0 10^{3}	4.5 10^{0}	7.0 10^{3}
^{241}Am	1.3 10^{2}	4.4 10^{-3}	3.9 10^{-1}	3.1 10^{0}	9.5 10^{-2}	2.2 10^{0}	6.8 10^{-1}	4.8 10^{-2}	7.0 10^{0}	9.0 10^{-6}	4.8 10^{-3}	5.4 10^{0}	5.0 10^{5}	3.2 10^{2}	5.0 10^{5}
^{242}Cm	2.5 10^{1}	1.8 10^{-4}	3.6 10^{-2}	2.9 10^{-1}	1.1 10^{-2}	2.6 10^{-1}	6.5 10^{-2}	5.2 10^{-3}	1.3 10^{0}	2.9 10^{-10}	8.3 10^{-5}	2.6 10^{-3}	1.3 10^{5}	6.9 10^{1}	1.3 10^{5}
^{244}Cm	1.0 10^{2}	1.3 10^{-3}	2.9 10^{-1}	2.4 10^{0}	7.3 10^{-2}	1.7 10^{0}	5.2 10^{-1}	3.6 10^{-2}	5.5 10^{0}	-	1.0 10^{-4}	9.0 10^{-3}	4.4 10^{5}	2.8 10^{2}	4.4 10^{5}

Table A35 Infant annual doses per unit release (1 TBq) for a cautious (Cat D) short-term release assessment (scenario 2b) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$4.2\ 10^{-1}$	$2.8\ 10^{-1}$	$4.6\ 10^{-3}$	$3.0\ 10^{-4}$	$1.3\ 10^{-3}$	$4.4\ 10^{-4}$	$5.2\ 10^{-1}$	$1.2\ 10^{-2}$	$2.1\ 10^{-1}$	-	-	-	$4.8\ 10^{-1}$	-	$1.9\ 10^{0}$
^{14}C	$1.2\ 10^{1}$	$8.8\ 10^{0}$	$2.8\ 10^{0}$	$1.9\ 10^{-1}$	$1.1\ 10^{0}$	$3.6\ 10^{-1}$	$7.1\ 10^{1}$	$2.2\ 10^{1}$	$7.8\ 10^{0}$	$8.0\ 10^{-4}$	-	-	$3.9\ 10^{1}$	-	$1.6\ 10^{2}$
^{35}S	$2.1\ 10^{1}$	$8.4\ 10^{0}$	$1.8\ 10^{1}$	$1.2\ 10^{0}$	$9.0\ 10^{0}$	$1.6\ 10^{0}$	$4.0\ 10^{2}$	$2.3\ 10^{2}$	$1.2\ 10^{1}$	$2.6\ 10^{-3}$	-	-	$4.0\ 10^{1}$	$8.3\ 10^{-3}$	$7.5\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$2.8\ 10^{-2}$	$7.7\ 10^{-1}$	-	-	-	$8.0\ 10^{-1}$
^{60}Co	$6.5\ 10^{2}$	$3.5\ 10^{-1}$	$2.7\ 10^{0}$	$1.8\ 10^{1}$	$4.7\ 10^{-1}$	$1.6\ 10^{1}$	$9.7\ 10^{2}$	$5.5\ 10^{2}$	$1.7\ 10^{1}$	$4.9\ 10^{-3}$	$1.5\ 10^{0}$	$1.8\ 10^{3}$	$3.2\ 10^{2}$	$2.4\ 10^{-2}$	$4.3\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$1.4\ 10^{-2}$	$1.3\ 10^{-3}$	-	-	-	$1.6\ 10^{-2}$
^{90}Sr	$1.9\ 10^{3}$	$2.9\ 10^{0}$	$3.1\ 10^{0}$	$2.1\ 10^{-1}$	$4.8\ 10^{-1}$	$1.6\ 10^{-1}$	$1.4\ 10^{3}$	$8.0\ 10^{2}$	$5.1\ 10^{1}$	$1.1\ 10^{-2}$	$3.2\ 10^{-11}$	$3.8\ 10^{-5}$	$1.0\ 10^{3}$	$7.5\ 10^{-2}$	$5.2\ 10^{3}$
^{106}Ru	$9.2\ 10^{2}$	$2.0\ 10^{-1}$	$2.9\ 10^{0}$	$1.9\ 10^{-1}$	$5.6\ 10^{-1}$	$1.9\ 10^{-1}$	$7.4\ 10^{-1}$	$4.2\ 10^{-1}$	$1.8\ 10^{1}$	$7.5\ 10^{-2}$	$8.1\ 10^{-2}$	$1.2\ 10^{2}$	$1.0\ 10^{3}$	$9.7\ 10^{-1}$	$2.1\ 10^{3}$
^{125}Sb	$1.4\ 10^{2}$	$7.3\ 10^{-2}$	$1.1\ 10^{0}$	$7.0\ 10^{0}$	$2.0\ 10^{-1}$	$6.6\ 10^{0}$	$1.1\ 10^{1}$	$6.0\ 10^{0}$	$3.6\ 10^{0}$	$5.3\ 10^{-3}$	$2.4\ 10^{-1}$	$2.8\ 10^{2}$	$1.5\ 10^{2}$	$1.1\ 10^{-2}$	$6.1\ 10^{2}$
^{129}I	$1.4\ 10^{4}$	$3.5\ 10^{3}$	$3.6\ 10^{2}$	$2.4\ 10^{1}$	$9.8\ 10^{1}$	$3.2\ 10^{1}$	$5.2\ 10^{4}$	$2.9\ 10^{4}$	$9.2\ 10^{3}$	$5.9\ 10^{-4}$	$1.2\ 10^{-2}$	$2.5\ 10^{1}$	$6.8\ 10^{2}$	$4.9\ 10^{-1}$	$1.1\ 10^{5}$
^{131}I	$3.9\ 10^{2}$	$2.2\ 10^{1}$	$2.6\ 10^{1}$	$2.0\ 10^{0}$	$7.9\ 10^{0}$	$2.6\ 10^{0}$	$7.5\ 10^{3}$	$3.6\ 10^{3}$	$6.2\ 10^{1}$	$1.1\ 10^{-2}$	$2.0\ 10^{-1}$	$5.0\ 10^{1}$	$5.8\ 10^{2}$	$1.4\ 10^{-1}$	$1.2\ 10^{4}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$6.0\ 10^{-3}$	$3.5\ 10^{-2}$	-	-	-	$4.1\ 10^{-2}$
^{137}Cs	$3.1\ 10^{2}$	$7.8\ 10^{1}$	$5.8\ 10^{1}$	$3.9\ 10^{0}$	$1.0\ 10^{1}$	$3.3\ 10^{0}$	$1.1\ 10^{3}$	$2.1\ 10^{2}$	$2.1\ 10^{2}$	$1.5\ 10^{-2}$	$6.2\ 10^{-2}$	$4.4\ 10^{2}$	$5.0\ 10^{1}$	$5.2\ 10^{-2}$	$2.5\ 10^{3}$
^{239}Pu	$1.1\ 10^{4}$	$1.4\ 10^{-2}$	$1.8\ 10^{0}$	$1.5\ 10^{1}$	$4.2\ 10^{-1}$	$1.0\ 10^{1}$	$3.2\ 10^{0}$	$1.8\ 10^{0}$	$2.1\ 10^{2}$	$3.1\ 10^{-4}$	$1.4\ 10^{-4}$	$5.6\ 10^{-2}$	$7.2\ 10^{5}$	$7.4\ 10^{2}$	$7.3\ 10^{5}$
^{241}Pu	$1.4\ 10^{2}$	$1.8\ 10^{-4}$	$2.4\ 10^{-2}$	$1.9\ 10^{-1}$	$5.6\ 10^{-3}$	$1.3\ 10^{-1}$	$4.2\ 10^{-2}$	$2.4\ 10^{-2}$	$2.8\ 10^{0}$	$1.3\ 10^{-8}$	$1.4\ 10^{-6}$	$9.7\ 10^{-3}$	$9.0\ 10^{3}$	$9.3\ 10^{0}$	$9.2\ 10^{3}$
^{241}Am	$9.5\ 10^{3}$	$1.9\ 10^{-2}$	$1.6\ 10^{0}$	$1.3\ 10^{1}$	$3.7\ 10^{-1}$	$8.8\ 10^{0}$	$2.8\ 10^{0}$	$1.6\ 10^{0}$	$1.8\ 10^{2}$	$1.1\ 10^{-5}$	$2.0\ 10^{-2}$	$1.2\ 10^{1}$	$6.4\ 10^{5}$	$6.6\ 10^{2}$	$6.5\ 10^{5}$
^{242}Cm	$1.0\ 10^{3}$	$6.2\ 10^{-4}$	$1.5\ 10^{-1}$	$1.2\ 10^{0}$	$4.4\ 10^{-2}$	$1.0\ 10^{0}$	$2.7\ 10^{-1}$	$1.5\ 10^{-1}$	$1.9\ 10^{1}$	$3.6\ 10^{-10}$	$3.3\ 10^{-4}$	$2.6\ 10^{-3}$	$1.7\ 10^{5}$	$1.5\ 10^{2}$	$1.7\ 10^{5}$
^{244}Cm	$7.3\ 10^{3}$	$5.5\ 10^{-3}$	$1.2\ 10^{0}$	$9.9\ 10^{0}$	$2.9\ 10^{-1}$	$6.8\ 10^{0}$	$2.2\ 10^{0}$	$1.2\ 10^{0}$	$1.4\ 10^{2}$	-	$4.1\ 10^{-4}$	$9.0\ 10^{-3}$	$5.6\ 10^{5}$	$5.8\ 10^{2}$	$5.7\ 10^{5}$

Table A36 Infant annual doses per unit release (1 TBq) for a cautious (Cat F) short-term release assessment (scenario 2c) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	1.5 10^{0}	9.8 10^{-1}	1.5 10^{-2}	9.7 10^{-4}	4.4 10^{-3}	1.5 10^{-3}	1.6 10^{0}	3.7 10^{-2}	7.3 10^{-1}	-	-	-	1.2 10^{0}	-	6.1 10^{0}
^{14}C	5.1 10^{1}	3.8 10^{1}	1.2 10^{1}	8.1 10^{-1}	4.7 10^{0}	1.6 10^{0}	3.0 10^{2}	9.3 10^{1}	3.4 10^{1}	2.5 10^{-3}	-	-	1.3 10^{2}	-	6.6 10^{2}
^{35}S	7.4 10^{1}	2.8 10^{1}	2.6 10^{1}	1.8 10^{0}	1.5 10^{1}	3.5 10^{0}	9.1 10^{2}	5.1 10^{2}	4.4 10^{1}	7.2 10^{-3}	-	-	1.1 10^{2}	8.3 10^{-3}	1.7 10^{3}
^{41}Ar	-	-	-	-	-	-	-	-	-	8.7 10^{-2}	2.0 10^{0}	-	-	-	2.1 10^{0}
^{60}Co	5.9 10^{2}	3.2 10^{-1}	2.4 10^{0}	1.6 10^{1}	4.3 10^{-1}	1.4 10^{1}	8.8 10^{2}	5.0 10^{2}	1.5 10^{1}	1.5 10^{-2}	3.7 10^{0}	2.8 10^{3}	9.9 10^{2}	2.4 10^{-2}	5.8 10^{3}
^{85}Kr	-	-	-	-	-	-	-	-	-	4.5 10^{-2}	3.3 10^{-3}	-	-	-	4.8 10^{-2}
^{90}Sr	1.7 10^{3}	2.6 10^{0}	2.8 10^{0}	1.9 10^{-1}	4.4 10^{-1}	1.5 10^{-1}	1.3 10^{3}	7.3 10^{2}	4.6 10^{1}	3.3 10^{-2}	2.1 10^{-10}	6.0 10^{-5}	3.2 10^{3}	7.5 10^{-2}	7.0 10^{3}
^{106}Ru	8.3 10^{2}	1.8 10^{-1}	2.6 10^{0}	1.7 10^{-1}	5.1 10^{-1}	1.7 10^{-1}	6.7 10^{-1}	3.8 10^{-1}	1.6 10^{1}	2.4 10^{-1}	2.8 10^{-1}	1.9 10^{2}	3.2 10^{3}	1.5 10^{0}	4.2 10^{3}
^{125}Sb	1.3 10^{2}	6.6 10^{-2}	9.6 10^{-1}	6.4 10^{0}	1.8 10^{-1}	6.0 10^{0}	9.6 10^{0}	5.4 10^{0}	3.3 10^{0}	1.6 10^{-2}	6.1 10^{-1}	4.4 10^{2}	4.7 10^{2}	1.1 10^{-2}	1.1 10^{3}
^{129}I	2.8 10^{4}	7.1 10^{3}	7.2 10^{2}	4.8 10^{1}	1.9 10^{2}	6.2 10^{1}	1.0 10^{5}	5.8 10^{4}	1.9 10^{4}	1.4 10^{-3}	2.7 10^{-2}	5.6 10^{1}	1.7 10^{3}	4.9 10^{-1}	2.2 10^{5}
^{131}I	7.5 10^{2}	3.8 10^{1}	4.9 10^{1}	3.9 10^{0}	1.5 10^{1}	5.0 10^{0}	1.4 10^{4}	6.9 10^{3}	1.1 10^{2}	2.5 10^{-2}	4.4 10^{-1}	1.1 10^{2}	1.4 10^{3}	1.4 10^{-1}	2.4 10^{4}
^{133}Xe	-	-	-	-	-	-	-	-	-	1.9 10^{-2}	8.8 10^{-2}	-	-	-	1.1 10^{-1}
^{137}Cs	2.8 10^{2}	7.1 10^{1}	5.2 10^{1}	3.5 10^{0}	9.1 10^{0}	3.0 10^{0}	1.0 10^{3}	1.9 10^{2}	1.9 10^{2}	4.5 10^{-2}	2.9 10^{-1}	6.9 10^{2}	1.6 10^{2}	8.1 10^{-2}	2.7 10^{3}
^{239}Pu	9.8 10^{3}	1.2 10^{-2}	1.7 10^{0}	1.3 10^{1}	3.8 10^{-1}	9.1 10^{0}	2.9 10^{0}	1.7 10^{0}	1.9 10^{2}	9.5 10^{-4}	4.0 10^{-4}	8.8 10^{-2}	2.3 10^{6}	1.2 10^{3}	2.3 10^{6}
^{241}Pu	1.3 10^{2}	1.6 10^{-4}	2.2 10^{-2}	1.8 10^{-1}	5.1 10^{-3}	1.2 10^{-1}	3.8 10^{-2}	2.2 10^{-2}	2.5 10^{0}	4.0 10^{-8}	3.5 10^{-6}	1.5 10^{-2}	2.8 10^{4}	1.4 10^{1}	2.9 10^{4}
^{241}Am	8.6 10^{3}	1.7 10^{-2}	1.5 10^{0}	1.2 10^{1}	3.4 10^{-1}	8.0 10^{0}	2.6 10^{0}	1.5 10^{0}	1.7 10^{2}	3.5 10^{-5}	5.0 10^{-2}	1.8 10^{1}	2.0 10^{6}	1.0 10^{3}	2.0 10^{6}
^{242}Cm	9.0 10^{2}	5.6 10^{-4}	1.3 10^{-1}	1.1 10^{0}	4.0 10^{-2}	9.3 10^{-1}	2.4 10^{-1}	1.4 10^{-1}	1.7 10^{1}	1.1 10^{-9}	9.8 10^{-4}	2.6 10^{-3}	5.3 10^{5}	2.3 10^{2}	5.3 10^{5}
^{244}Cm	6.7 10^{3}	5.0 10^{-3}	1.1 10^{0}	9.0 10^{0}	2.6 10^{-1}	6.2 10^{0}	2.0 10^{0}	1.1 10^{0}	1.3 10^{2}	-	1.1 10^{-3}	9.0 10^{-3}	1.8 10^{6}	9.1 10^{2}	1.8 10^{6}

Table A37 Infant annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 3a) (μSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$1.3\ 10^{-2}$	$9.5\ 10^{-3}$	$1.4\ 10^{-3}$	$9.0\ 10^{-5}$	$3.5\ 10^{-4}$	$1.2\ 10^{-4}$	$1.6\ 10^{-1}$	$1.7\ 10^{-3}$	$6.4\ 10^{-3}$	-	-	-	$2.2\ 10^{-1}$	-	$4.1\ 10^{-1}$
^{14}C	$5.5\ 10^{-1}$	$7.6\ 10^{-1}$	$4.3\ 10^{-1}$	$2.9\ 10^{-2}$	$1.3\ 10^{-1}$	$4.5\ 10^{-2}$	$1.2\ 10^{1}$	$1.8\ 10^{0}$	$4.3\ 10^{-1}$	$3.2\ 10^{-4}$	-	-	$1.4\ 10^{1}$	-	$3.0\ 10^{1}$
^{35}S	$2.9\ 10^{0}$	$1.9\ 10^{0}$	$1.8\ 10^{1}$	$1.2\ 10^{0}$	$8.6\ 10^{0}$	$1.2\ 10^{0}$	$2.8\ 10^{2}$	$1.6\ 10^{2}$	$1.2\ 10^{0}$	$1.0\ 10^{-3}$	-	-	$1.4\ 10^{1}$	$1.0\ 10^{-2}$	$4.9\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$1.1\ 10^{-2}$	$8.7\ 10^{-2}$	-	-	-	$9.8\ 10^{-2}$
^{60}Co	$5.2\ 10^{0}$	$3.1\ 10^{-2}$	$2.8\ 10^{-1}$	$1.8\ 10^{0}$	$6.1\ 10^{-2}$	$2.0\ 10^{0}$	$9.5\ 10^{1}$	$1.6\ 10^{1}$	$9.9\ 10^{-1}$	$1.9\ 10^{-3}$	$1.7\ 10^{-1}$	$3.5\ 10^{2}$	$1.1\ 10^{2}$	$2.9\ 10^{-2}$	$5.8\ 10^{2}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$5.7\ 10^{-3}$	$1.6\ 10^{-4}$	-	-	-	$5.9\ 10^{-3}$
^{90}Sr	$1.6\ 10^{1}$	$2.7\ 10^{-1}$	$3.4\ 10^{-1}$	$2.2\ 10^{-2}$	$6.2\ 10^{-2}$	$2.1\ 10^{-2}$	$1.5\ 10^{2}$	$3.0\ 10^{1}$	$2.9\ 10^{0}$	$4.4\ 10^{-3}$	$2.2\ 10^{-12}$	$7.6\ 10^{-6}$	$3.7\ 10^{2}$	$9.2\ 10^{-2}$	$5.7\ 10^{2}$
^{106}Ru	$8.7\ 10^{0}$	$2.3\ 10^{-2}$	$3.1\ 10^{-1}$	$2.1\ 10^{-2}$	$7.2\ 10^{-2}$	$2.4\ 10^{-2}$	$7.6\ 10^{-2}$	$1.4\ 10^{-2}$	$4.5\ 10^{-1}$	$2.7\ 10^{-2}$	$9.8\ 10^{-3}$	$2.4\ 10^{1}$	$3.3\ 10^{2}$	$2.2\ 10^{-1}$	$3.7\ 10^{2}$
^{125}Sb	$1.2\ 10^{0}$	$6.7\ 10^{-3}$	$1.0\ 10^{-1}$	$7.0\ 10^{-1}$	$2.5\ 10^{-2}$	$8.6\ 10^{-1}$	$1.0\ 10^{0}$	$1.7\ 10^{-1}$	$2.2\ 10^{-1}$	$2.1\ 10^{-3}$	$3.0\ 10^{-2}$	$5.7\ 10^{1}$	$5.4\ 10^{1}$	$1.4\ 10^{-2}$	$1.1\ 10^{2}$
^{129}I	$2.9\ 10^{2}$	$3.6\ 10^{2}$	$7.5\ 10^{1}$	$5.0\ 10^{0}$	$2.7\ 10^{1}$	$9.0\ 10^{0}$	$1.1\ 10^{4}$	$2.1\ 10^{3}$	$6.6\ 10^{2}$	$2.3\ 10^{-4}$	$1.5\ 10^{-3}$	$7.6\ 10^{0}$	$2.4\ 10^{2}$	$6.0\ 10^{-1}$	$1.5\ 10^{4}$
^{131}I	$7.5\ 10^{1}$	$1.3\ 10^{1}$	$7.4\ 10^{0}$	$5.9\ 10^{-1}$	$2.3\ 10^{0}$	$7.5\ 10^{-1}$	$2.1\ 10^{3}$	$5.4\ 10^{2}$	$5.6\ 10^{1}$	$4.2\ 10^{-3}$	$2.5\ 10^{-2}$	$1.8\ 10^{1}$	$2.1\ 10^{2}$	$1.7\ 10^{-1}$	$3.0\ 10^{3}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$2.4\ 10^{-3}$	$4.2\ 10^{-3}$	-	-	-	$6.6\ 10^{-3}$
^{137}Cs	$2.8\ 10^{0}$	$3.6\ 10^{0}$	$5.7\ 10^{0}$	$3.8\ 10^{-1}$	$1.3\ 10^{0}$	$4.3\ 10^{-1}$	$1.1\ 10^{2}$	$1.7\ 10^{1}$	$7.3\ 10^{0}$	$6.0\ 10^{-3}$	$7.6\ 10^{-3}$	$8.7\ 10^{1}$	$1.8\ 10^{1}$	$1.2\ 10^{-2}$	$2.5\ 10^{2}$
^{239}Pu	$7.7\ 10^{1}$	$1.3\ 10^{-3}$	$1.9\ 10^{-1}$	$1.6\ 10^{0}$	$5.5\ 10^{-2}$	$1.3\ 10^{0}$	$3.3\ 10^{-1}$	$6.5\ 10^{-2}$	$3.8\ 10^{0}$	$1.3\ 10^{-4}$	$1.8\ 10^{-5}$	$1.1\ 10^{-2}$	$2.6\ 10^{5}$	$1.7\ 10^{2}$	$2.6\ 10^{5}$
^{241}Pu	$1.0\ 10^{0}$	$1.7\ 10^{-5}$	$2.5\ 10^{-3}$	$2.1\ 10^{-2}$	$7.2\ 10^{-4}$	$1.7\ 10^{-2}$	$4.4\ 10^{-3}$	$8.5\ 10^{-4}$	$5.2\ 10^{-2}$	$5.3\ 10^{-9}$	$1.7\ 10^{-7}$	$1.8\ 10^{-3}$	$3.3\ 10^{3}$	$2.1\ 10^{0}$	$3.3\ 10^{3}$
^{241}Am	$6.8\ 10^{1}$	$1.8\ 10^{-3}$	$1.7\ 10^{-1}$	$1.4\ 10^{0}$	$4.8\ 10^{-2}$	$1.1\ 10^{0}$	$3.0\ 10^{-1}$	$5.9\ 10^{-2}$	$3.4\ 10^{0}$	$4.6\ 10^{-6}$	$2.5\ 10^{-3}$	$2.3\ 10^{0}$	$2.3\ 10^{5}$	$1.5\ 10^{2}$	$2.3\ 10^{5}$
^{242}Cm	$1.3\ 10^{1}$	$8.3\ 10^{-5}$	$1.7\ 10^{-2}$	$1.3\ 10^{-1}$	$5.7\ 10^{-3}$	$1.3\ 10^{-1}$	$3.0\ 10^{-2}$	$6.3\ 10^{-3}$	$6.5\ 10^{-1}$	$1.5\ 10^{-10}$	$4.2\ 10^{-5}$	$3.1\ 10^{-3}$	$6.1\ 10^{4}$	$3.2\ 10^{1}$	$6.1\ 10^{4}$
^{244}Cm	$5.3\ 10^{1}$	$5.3\ 10^{-4}$	$1.3\ 10^{-1}$	$1.1\ 10^{0}$	$3.7\ 10^{-2}$	$8.8\ 10^{-1}$	$2.3\ 10^{-1}$	$4.4\ 10^{-2}$	$2.7\ 10^{0}$	-	$5.1\ 10^{-5}$	$1.1\ 10^{-2}$	$2.0\ 10^{5}$	$1.3\ 10^{2}$	$2.0\ 10^{5}$

Table A38 Infant annual doses per unit release (1 TBq) for a cautious (Cat D) short-term release assessment (scenario 3b) (μSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$1.4\ 10^{-1}$	$9.7\ 10^{-2}$	$2.0\ 10^{-3}$	$1.3\ 10^{-4}$	$5.3\ 10^{-4}$	$1.8\ 10^{-4}$	$2.3\ 10^{-1}$	$5.2\ 10^{-3}$	$7.2\ 10^{-2}$	-	-	-	$2.5\ 10^{-1}$	-	$8.0\ 10^{-1}$
^{14}C	$4.1\ 10^{0}$	$3.4\ 10^{0}$	$1.1\ 10^{0}$	$7.2\ 10^{-2}$	$3.9\ 10^{-1}$	$1.3\ 10^{-1}$	$2.8\ 10^{1}$	$8.7\ 10^{0}$	$2.8\ 10^{0}$	$3.8\ 10^{-4}$	-	-	$1.7\ 10^{1}$	-	$6.6\ 10^{1}$
^{35}S	$8.3\ 10^{0}$	$3.7\ 10^{0}$	$1.9\ 10^{1}$	$1.3\ 10^{0}$	$9.1\ 10^{0}$	$1.3\ 10^{0}$	$3.3\ 10^{2}$	$1.9\ 10^{2}$	$4.4\ 10^{0}$	$1.2\ 10^{-3}$	-	-	$1.7\ 10^{1}$	$1.0\ 10^{-2}$	$5.8\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$1.3\ 10^{-2}$	$2.9\ 10^{-1}$	-	-	-	$3.0\ 10^{-1}$
^{60}Co	$2.2\ 10^{2}$	$1.2\ 10^{-1}$	$9.5\ 10^{-1}$	$6.3\ 10^{0}$	$1.8\ 10^{-1}$	$5.9\ 10^{0}$	$3.4\ 10^{2}$	$1.9\ 10^{2}$	$5.8\ 10^{0}$	$2.3\ 10^{-3}$	$5.5\ 10^{-1}$	$6.7\ 10^{2}$	$1.4\ 10^{2}$	$2.9\ 10^{-2}$	$1.6\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$6.8\ 10^{-3}$	$4.9\ 10^{-4}$	-	-	-	$7.3\ 10^{-3}$
^{90}Sr	$6.3\ 10^{2}$	$1.0\ 10^{0}$	$1.1\ 10^{0}$	$7.5\ 10^{-2}$	$1.8\ 10^{-1}$	$6.1\ 10^{-2}$	$5.1\ 10^{2}$	$2.9\ 10^{2}$	$1.7\ 10^{1}$	$5.2\ 10^{-3}$	$1.1\ 10^{-11}$	$1.4\ 10^{-5}$	$4.5\ 10^{2}$	$9.2\ 10^{-2}$	$1.9\ 10^{3}$
^{106}Ru	$3.1\ 10^{2}$	$7.4\ 10^{-2}$	$1.0\ 10^{0}$	$6.9\ 10^{-2}$	$2.1\ 10^{-1}$	$7.0\ 10^{-2}$	$2.6\ 10^{-1}$	$1.5\ 10^{-1}$	$6.0\ 10^{0}$	$3.3\ 10^{-2}$	$3.0\ 10^{-2}$	$4.5\ 10^{1}$	$4.1\ 10^{2}$	$3.9\ 10^{-1}$	$7.7\ 10^{2}$
^{125}Sb	$4.7\ 10^{1}$	$2.6\ 10^{-2}$	$3.7\ 10^{-1}$	$2.5\ 10^{0}$	$7.5\ 10^{-2}$	$2.5\ 10^{0}$	$3.7\ 10^{0}$	$2.1\ 10^{0}$	$1.2\ 10^{0}$	$2.5\ 10^{-3}$	$9.1\ 10^{-2}$	$1.1\ 10^{2}$	$6.5\ 10^{1}$	$1.4\ 10^{-2}$	$2.3\ 10^{2}$
^{129}I	$4.7\ 10^{3}$	$1.3\ 10^{3}$	$1.4\ 10^{2}$	$9.3\ 10^{0}$	$4.3\ 10^{1}$	$1.4\ 10^{1}$	$2.0\ 10^{4}$	$1.1\ 10^{4}$	$3.1\ 10^{3}$	$2.8\ 10^{-4}$	$4.4\ 10^{-3}$	$1.0\ 10^{1}$	$2.9\ 10^{2}$	$6.0\ 10^{-1}$	$4.1\ 10^{4}$
^{131}I	$1.6\ 10^{2}$	$1.3\ 10^{1}$	$1.2\ 10^{1}$	$9.2\ 10^{-1}$	$3.6\ 10^{0}$	$1.2\ 10^{0}$	$3.3\ 10^{3}$	$1.6\ 10^{3}$	$3.2\ 10^{1}$	$5.0\ 10^{-3}$	$7.6\ 10^{-2}$	$2.3\ 10^{1}$	$2.5\ 10^{2}$	$1.7\ 10^{-1}$	$5.4\ 10^{3}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$2.9\ 10^{-3}$	$1.3\ 10^{-2}$	-	-	-	$1.6\ 10^{-2}$
^{137}Cs	$1.0\ 10^{2}$	$2.7\ 10^{1}$	$2.0\ 10^{1}$	$1.4\ 10^{0}$	$3.8\ 10^{0}$	$1.3\ 10^{0}$	$4.0\ 10^{2}$	$8.2\ 10^{1}$	$6.9\ 10^{1}$	$7.1\ 10^{-3}$	$2.3\ 10^{-2}$	$1.7\ 10^{2}$	$2.2\ 10^{1}$	$2.1\ 10^{-2}$	$8.9\ 10^{2}$
^{239}Pu	$3.6\ 10^{3}$	$4.8\ 10^{-3}$	$6.5\ 10^{-1}$	$5.3\ 10^{0}$	$1.6\ 10^{-1}$	$3.8\ 10^{0}$	$1.1\ 10^{0}$	$6.6\ 10^{-1}$	$7.0\ 10^{1}$	$1.5\ 10^{-4}$	$5.3\ 10^{-5}$	$2.1\ 10^{-2}$	$3.1\ 10^{5}$	$3.0\ 10^{2}$	$3.2\ 10^{5}$
^{241}Pu	$4.8\ 10^{1}$	$6.3\ 10^{-5}$	$8.6\ 10^{-3}$	$7.0\ 10^{-2}$	$2.1\ 10^{-3}$	$5.0\ 10^{-2}$	$1.5\ 10^{-2}$	$8.6\ 10^{-3}$	$9.3\ 10^{-1}$	$6.3\ 10^{-9}$	$5.2\ 10^{-7}$	$3.5\ 10^{-3}$	$3.9\ 10^{3}$	$3.7\ 10^{0}$	$4.0\ 10^{3}$
^{241}Am	$3.2\ 10^{3}$	$6.8\ 10^{-3}$	$5.8\ 10^{-1}$	$4.6\ 10^{0}$	$1.4\ 10^{-1}$	$3.3\ 10^{0}$	$1.0\ 10^{0}$	$5.8\ 10^{-1}$	$6.2\ 10^{1}$	$5.4\ 10^{-6}$	$7.5\ 10^{-3}$	$4.4\ 10^{0}$	$2.8\ 10^{5}$	$2.7\ 10^{2}$	$2.8\ 10^{5}$
^{242}Cm	$3.4\ 10^{2}$	$2.3\ 10^{-4}$	$5.4\ 10^{-2}$	$4.3\ 10^{-1}$	$1.7\ 10^{-2}$	$3.9\ 10^{-1}$	$9.6\ 10^{-2}$	$5.5\ 10^{-2}$	$6.6\ 10^{0}$	$1.7\ 10^{-10}$	$1.3\ 10^{-4}$	$3.1\ 10^{-3}$	$7.3\ 10^{4}$	$5.8\ 10^{1}$	$7.4\ 10^{4}$
^{244}Cm	$2.5\ 10^{3}$	$1.9\ 10^{-3}$	$4.4\ 10^{-1}$	$3.6\ 10^{0}$	$1.1\ 10^{-1}$	$2.6\ 10^{0}$	$7.8\ 10^{-1}$	$4.4\ 10^{-1}$	$4.8\ 10^{1}$	-	$1.5\ 10^{-4}$	$1.1\ 10^{-2}$	$2.4\ 10^{5}$	$2.3\ 10^{2}$	$2.5\ 10^{5}$

Table A39 Infant annual doses per unit release (1 TBq) for a cautious (Cat F) short-term release assessment (scenario 3c) (µSv)

Radionuclide	Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Milk products	Fruit	Cloud beta	Cloud gamma	Deposited gamma	Inhalation	Re-suspension	Total
^{3}H	$4.9\ 10^{-1}$	$3.3\ 10^{-1}$	$5.3\ 10^{-3}$	$3.5\ 10^{-4}$	$1.5\ 10^{-3}$	$5.1\ 10^{-4}$	$6.0\ 10^{-1}$	$1.4\ 10^{-2}$	$2.4\ 10^{-1}$	-	-	-	$5.0\ 10^{-1}$	-	$2.2\ 10^{0}$
^{14}C	$1.7\ 10^{1}$	$1.3\ 10^{1}$	$4.2\ 10^{0}$	$2.8\ 10^{-1}$	$1.6\ 10^{0}$	$5.3\ 10^{-1}$	$1.0\ 10^{2}$	$3.2\ 10^{1}$	$1.2\ 10^{1}$	$9.4\ 10^{-4}$	-	-	$4.6\ 10^{1}$	-	$2.3\ 10^{2}$
^{35}S	$2.6\ 10^{1}$	$1.0\ 10^{1}$	$2.1\ 10^{1}$	$1.5\ 10^{0}$	$1.1\ 10^{1}$	$2.0\ 10^{0}$	$5.0\ 10^{2}$	$2.8\ 10^{2}$	$1.5\ 10^{1}$	$2.8\ 10^{-3}$	-	-	$4.2\ 10^{1}$	$1.0\ 10^{-2}$	$9.1\ 10^{2}$
^{41}Ar	-	-	-	-	-	-	-	-	-	$3.3\ 10^{-2}$	$6.9\ 10^{-1}$	-	-	-	$7.2\ 10^{-1}$
^{60}Co	$2.0\ 10^{2}$	$1.1\ 10^{-1}$	$8.7\ 10^{-1}$	$5.8\ 10^{0}$	$1.6\ 10^{-1}$	$5.4\ 10^{0}$	$3.1\ 10^{2}$	$1.8\ 10^{2}$	$5.3\ 10^{0}$	$5.6\ 10^{-3}$	$1.3\ 10^{0}$	$1.0\ 10^{3}$	$3.6\ 10^{2}$	$2.9\ 10^{-2}$	$2.1\ 10^{3}$
^{85}Kr	-	-	-	-	-	-	-	-	-	$1.7\ 10^{-2}$	$1.1\ 10^{-3}$	-	-	-	$1.8\ 10^{-2}$
^{90}Sr	$5.7\ 10^{2}$	$9.3\ 10^{-1}$	$1.0\ 10^{0}$	$6.9\ 10^{-2}$	$1.7\ 10^{-1}$	$5.6\ 10^{-2}$	$4.7\ 10^{2}$	$2.7\ 10^{2}$	$1.6\ 10^{1}$	$1.3\ 10^{-2}$	$7.1\ 10^{-11}$	$2.2\ 10^{-5}$	$1.2\ 10^{3}$	$9.2\ 10^{-2}$	$2.5\ 10^{3}$
^{106}Ru	$2.8\ 10^{2}$	$6.7\ 10^{-2}$	$9.5\ 10^{-1}$	$6.3\ 10^{-2}$	$1.9\ 10^{-1}$	$6.4\ 10^{-2}$	$2.4\ 10^{-1}$	$1.4\ 10^{-1}$	$5.5\ 10^{0}$	$8.7\ 10^{-2}$	$9.7\ 10^{-2}$	$6.7\ 10^{1}$	$1.1\ 10^{3}$	$5.7\ 10^{-1}$	$1.5\ 10^{3}$
^{125}Sb	$4.3\ 10^{1}$	$2.3\ 10^{-2}$	$3.4\ 10^{-1}$	$2.3\ 10^{0}$	$6.9\ 10^{-2}$	$2.3\ 10^{0}$	$3.4\ 10^{0}$	$1.9\ 10^{0}$	$1.1\ 10^{0}$	$6.1\ 10^{-3}$	$2.1\ 10^{-1}$	$1.6\ 10^{2}$	$1.7\ 10^{2}$	$1.4\ 10^{-2}$	$3.9\ 10^{2}$
^{129}I	$9.4\ 10^{3}$	$2.5\ 10^{3}$	$2.6\ 10^{2}$	$1.7\ 10^{1}$	$7.3\ 10^{1}$	$2.4\ 10^{1}$	$3.7\ 10^{4}$	$2.1\ 10^{4}$	$6.3\ 10^{3}$	$5.5\ 10^{-4}$	$9.4\ 10^{-3}$	$2.0\ 10^{1}$	$6.2\ 10^{2}$	$6.0\ 10^{-1}$	$7.7\ 10^{4}$
^{131}I	$2.8\ 10^{2}$	$1.9\ 10^{1}$	$1.9\ 10^{1}$	$1.5\ 10^{0}$	$5.9\ 10^{0}$	$2.0\ 10^{0}$	$5.6\ 10^{3}$	$2.7\ 10^{3}$	$4.9\ 10^{1}$	$9.8\ 10^{-3}$	$1.5\ 10^{-1}$	$4.2\ 10^{1}$	$5.2\ 10^{2}$	$1.7\ 10^{-1}$	$9.2\ 10^{3}$
^{133}Xe	-	-	-	-	-	-	-	-	-	$7.1\ 10^{-3}$	$3.1\ 10^{-2}$	-	-	-	$3.8\ 10^{-2}$
^{137}Cs	$9.4\ 10^{1}$	$2.4\ 10^{1}$	$1.9\ 10^{1}$	$1.2\ 10^{0}$	$3.5\ 10^{0}$	$1.2\ 10^{0}$	$3.6\ 10^{2}$	$7.6\ 10^{1}$	$6.3\ 10^{1}$	$1.7\ 10^{-2}$	$1.0\ 10^{-1}$	$2.5\ 10^{2}$	$5.8\ 10^{1}$	$3.0\ 10^{-2}$	$9.5\ 10^{2}$
^{239}Pu	$3.3\ 10^{3}$	$4.4\ 10^{-3}$	$6.0\ 10^{-1}$	$4.8\ 10^{0}$	$1.5\ 10^{-1}$	$3.5\ 10^{0}$	$1.0\ 10^{0}$	$6.0\ 10^{-1}$	$6.4\ 10^{1}$	$3.6\ 10^{-4}$	$1.4\ 10^{-4}$	$3.2\ 10^{-2}$	$8.2\ 10^{5}$	$4.4\ 10^{2}$	$8.3\ 10^{5}$
^{241}Pu	$4.4\ 10^{1}$	$5.8\ 10^{-5}$	$7.9\ 10^{-3}$	$6.4\ 10^{-2}$	$1.9\ 10^{-3}$	$4.6\ 10^{-2}$	$1.4\ 10^{-2}$	$7.9\ 10^{-3}$	$8.5\ 10^{-1}$	$1.5\ 10^{-8}$	$1.2\ 10^{-6}$	$5.4\ 10^{-3}$	$1.0\ 10^{4}$	$5.4\ 10^{0}$	$1.0\ 10^{4}$
^{241}Am	$2.9\ 10^{3}$	$6.2\ 10^{-3}$	$5.3\ 10^{-1}$	$4.3\ 10^{0}$	$1.3\ 10^{-1}$	$3.1\ 10^{0}$	$9.3\ 10^{-1}$	$5.3\ 10^{-1}$	$5.6\ 10^{1}$	$1.3\ 10^{-5}$	$1.7\ 10^{-2}$	$6.6\ 10^{0}$	$7.4\ 10^{5}$	$3.9\ 10^{2}$	$7.4\ 10^{5}$
^{242}Cm	$3.1\ 10^{2}$	$2.1\ 10^{-4}$	$4.9\ 10^{-2}$	$4.0\ 10^{-1}$	$1.5\ 10^{-2}$	$3.6\ 10^{-1}$	$8.8\ 10^{-2}$	$5.0\ 10^{-2}$	$6.0\ 10^{0}$	$4.2\ 10^{-10}$	$3.4\ 10^{-4}$	$3.1\ 10^{-3}$	$1.9\ 10^{5}$	$8.5\ 10^{1}$	$1.9\ 10^{5}$
^{244}Cm	$2.2\ 10^{3}$	$1.8\ 10^{-3}$	$4.0\ 10^{-1}$	$3.3\ 10^{0}$	$1.0\ 10^{-1}$	$2.4\ 10^{0}$	$7.1\ 10^{-1}$	$4.1\ 10^{-1}$	$4.3\ 10^{1}$	-	$4.0\ 10^{-4}$	$1.1\ 10^{-2}$	$6.5\ 10^{5}$	$3.4\ 10^{2}$	$6.5\ 10^{5}$

APPENDIX B SUMMARY OF MAIN CHANGES IN GUIDANCE

Although there are no changes to the overall advice given regarding when and how to carry out dose assessments for short-term releases there have been some changes to input data. This appendix summarises the main changes between the original report NDAWG-1-2010 and the revised NDAWG-1-2020 report.

The main difference between the original and revised guidance are:

- Update to legislation.
- Removal of guidance from this document and reference to the NDAWG short term release assessment guidance.
- The use of the Food Standards Agency's foodchain model PRISM 3.7.0 (run date: July to October 2018) to calculate activity concentrations of ^{14}C and ^{35}S in each foodstuff following a short-term release. The activity concentrations of ^{14}C and ^{35}S in foods are now presented in units of Bq y kg^{-1} per Bq m^{-3} (Tables A3 and A4). The PRISM model has replaced the SPADE model which was used in the previous guidance, NDAWG-1-2010. The impacts of these changes on the dose per unit release values for the realistic meteorological conditions are summarised in Tables B1 to B3.
- Correction to ^{3}H dry deposition velocity used for the dose per unit release calculations. Figures 3 to 11 and Tables A10 to A39 have been updated for ^{3}H

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Table B1 Adult annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 1a) (µSv)

Radionuclide	Model	Dose from ingestion of terrestrial food (µSv)							
		Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Fruit
^{14}C	PRISM 2018	4.8 10^{0}	3.3 10^{0}	5.3 10^{0}	3.5 10^{-1}	7.0 10^{-1}	2.1 10^{0}	1.9 10^{1}	1.0 10^{0}
	SPADE 2010	1.7 10^{1}	3.1 10^{1}	2.2 10^{1}	1.2 10^{0}	5.6 10^{0}	1.2 10^{0}	6.5 10^{1}	8.8 10^{0}
^{35}S	PRISM 2018	9.5 10^{0}	4.9 10^{0}	2.6 10^{0}	1.8 10^{-1}	5.7 10^{-1}	1.7 10^{0}	2.2 10^{1}	2.6 10^{0}
	SPADE 2010	1.4 10^{2}	1.8 10^{2}	1.5 10^{-1}	1.0 10^{-2}	3.2 10^{-1}	1.1 10^{-1}	1.4 10^{2}	2.1 10^{1}

Table B2 Child annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 1a) (µSv)

Radionuclide	Model	Dose from ingestion of terrestrial food (µSv)							
		Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Fruit
^{14}C	PRISM 2018	2.8 10^{0}	4.2 10^{0}	4.9 10^{0}	2.4 10^{-1}	4.8 10^{-1}	1.4 10^{0}	2.8 10^{1}	1.4 10^{0}
	SPADE 2010	1.0 10^{1}	3.8 10^{1}	2.0 10^{1}	8.4 10^{-1}	3.8 10^{0}	8.4 10^{-1}	9.4 10^{1}	1.2 10^{1}
^{35}S	PRISM 2018	8.5 10^{0}	9.1 10^{0}	3.6 10^{0}	1.8 10^{-1}	5.9 10^{-1}	1.8 10^{0}	4.7 10^{1}	5.4 10^{0}
	SPADE 2010	1.2 10^{2}	3.3 10^{2}	2.1 10^{-1}	1.1 10^{-2}	3.3 10^{-1}	1.1 10^{-1}	3.1 10^{2}	4.4 10^{1}

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Table B3 Infant annual doses per unit release (1 TBq) for a realistic short-term release assessment (scenario 1a) (µSv)

Radionuclide	Model	Dose from ingestion of terrestrial food (µSv)							
		Green vegetables	Root vegetables	Cow meat	Cow liver	Sheep meat	Sheep liver	Milk	Fruit
^{14}C	PRISM 2018	2.8 10^{0}	1.8 10^{0}	2.9 10^{0}	2.0 10^{-1}	3.8 10^{-1}	1.2 10^{0}	7.3 10^{1}	1.4 10^{0}
	SPADE 2010	1.0 10^{1}	1.7 10^{1}	1.2 10^{1}	6.7 10^{-1}	3.1 10^{0}	6.7 10^{-1}	2.5 10^{2}	1.2 10^{1}
^{35}S	PRISM 2018	1.4 10^{1}	6.8 10^{0}	3.6 10^{0}	2.5 10^{-1}	8.0 10^{-1}	2.4 10^{0}	2.1 10^{2}	9.1 10^{0}
	SPADE 2010	2.0 10^{2}	2.5 10^{2}	2.1 10^{-1}	1.5 10^{-2}	4.5 10^{-1}	1.5 10^{-1}	1.4 10^{3}	7.3 10^{1}