

The Radiological Conditions in Areas of Kuwait with Residues of Depleted Uranium

EXECUTIVE SUMMARY

Depleted uranium is one of the by-products of uranium enrichment and, like any other uranium compounds, has both chemical and radiological toxicity; it is mildly radioactive, i.e. it has about 60% of the radioactivity of natural uranium. Depleted uranium has had a wide range of peaceful applications, such as the provision of radiation shielding for medical sources or as counterweights in aeroplanes. Depleted uranium is also used for heavy tank armour and, due to its high density and melting point and its property of becoming “sharper” as it penetrates armoured plating, in anti-tank munitions and missiles.

The 1991 Gulf War was the first conflict in which depleted uranium (DU) munitions were used extensively. In view of the concerns raised by the possible linkage between human exposure to ionizing radiation from depleted uranium and harmful biological effects, the Government of Kuwait, in February 2001, requested the International Atomic Energy Agency to conduct surveys and assessments for a number of specified locations. The aim of this work was to inform the Government of Kuwait and the public on the possible long-term radiological impact of any depleted uranium residues at these sites.

The IAEA accepted the request for a radiological assessment under its unique statutory functions within the United Nations organisations, namely (i) to establish standards of safety for the protection of health against radiation exposure and (ii) to provide for the application of these standards. In 1996, the IAEA, in co-sponsorship with other relevant organizations in the United Nations system, established International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS). These are fully applicable to all forms of radiation exposure, including exposure to any uranium radionuclides in general and, in particular, to depleted uranium.

In the past, a number of evaluations of the environmental and health impact of depleted uranium ammunition have been performed by national and international organizations. This report constitutes the first comprehensive radiological assessment of compliance with international radiation protection criteria and standards for areas with residues of depleted uranium ammunition that has been carried out under the auspices of the IAEA.

The IAEA assembled a team of senior international experts, including a representative of the United Nations Environment Programme (UNEP). The team was led by Professor Roger H Clarke, Chairman of the International Commission on Radiological Protection. The experts visited Kuwait in September 2001 to assess the sites identified by the Government of Kuwait and to evaluate available information. The 11 locations selected for the investigation¹ included sites where military actions took place during the Gulf War in which DU munitions were used, sites where DU residues still exist and areas where concern has been expressed about the possible contamination of water and foodstuffs with depleted uranium. In February 2002, a mission took place to collect samples at the identified sites. The sampling team included scientists from the IAEA Secretariat and the Spiez Laboratory in Switzerland, representing UNEP, together with experts from the laboratory of the Radiation Protection Department of

¹ The locations investigated were: Al Doha, Al Jahra, Al Mutlaa, the water extraction facility at Al Rawdhatine, the farming areas at Al Wafrah and Al Abdali, the Manageesh oilfields (Manageesh Gathering Centre 28 and Umm Gudayar Gathering Centre 18), the storage grounds near the Military Hospital, at Al Sabhan and at the military base of Um Al Kwaty.

the Ministry of Health of Kuwait.. Around 200 environmental samples, including soil, water and vegetation were collected during the campaign and subsequently analysed.

The international team of experts prepared a report describing the findings of the measurement programme and the subsequent assessment performed by the team. The report provides a detailed description of the IAEA's investigation of the radiological conditions in Kuwait in relation to residues of depleted uranium, the results of the radiological assessment, the overall and site specific findings and conclusions of the assessment, and the recommendations of the expert group.

On the basis of the measurements carried out at the sites investigated during the IAEA's study and summarised in the report, depleted uranium does not pose a long-term radiological hazard to the general population of Kuwait. Potential annual radiation doses arising from exposure to depleted uranium residues are very low and of little radiological concern. Annual potential radiation doses in the areas where residues do exist are of the order of a few microSieverts, well below the annual doses received by the population of Kuwait from sources of natural radiation in the environment and far below the reference level recommended by the IAEA as a criterion to help establish whether remedial actions are necessary.

Complete DU penetrators or fragments can still be found at some locations where these weapons were used during the Gulf War, such as at the oilfields at Manageesh. Prolonged skin contact with these DU residues is the only potential exposure pathway that could result in exposures of any radiological significance. As long as access to the areas remains restricted, the likelihood that members of the public could pick up or otherwise come into contact with these residues is low.

The authorities of Kuwait have the competence and equipment to carry out the necessary monitoring and survey activities in relation to depleted uranium. The analysis techniques used by the Radiation Protection Department of the Ministry of Health of Kuwait are sufficient to determine whether or not concentrations of uranium in environmental samples are of radiological concern.