

Depleted Uranium Munitions

A Parliamentary Briefing

What is Depleted Uranium?

Depleted Uranium (DU) is waste from the process of enriching natural Uranium for use in nuclear reactor fuel and weapons. DU is used in a range of medium to large calibre armour-piercing munitions because it is extremely heavy (1.7 times the density of lead) and it burns rapidly on impact. These are classed as Kinetic Energy (KE) penetrators.¹ Unlike chemical explosives, they use their high density and velocity to penetrate armour.

Why is DU a Concern?

About one-third of the 800,000 United States (US) and United Kingdom (UK) veterans of the 1991 Gulf War now claim disability benefits for mystery illnesses, DU exposure has been implicated as one of the potential risk factors. There have been sharp increases in certain cancers and child deformities in Iraq after 1991 and 2003, and possibly in Afghanistan after 2001.

DU is a radioactive and chemically toxic heavy metal. It was used by US and UK forces in Iraq in 1991 and 2003, and by the US in the Balkans in the 1990s. Its use in Afghanistan is suspected, but this is denied by the US; and a similar situation pertains to Israel in Lebanon in 2006 and Gaza in 2009. User states have historically been reluctant to release targeting data as this infers responsibility, and this has had significant implications for effective decontamination programmes.

Why is DU a Health Hazard?

Upon impact with a hard target, DU munitions burn at a very high temperature, forming a mixture of extremely fine partially soluble and insoluble particles which can be inhaled causing both heavy metal toxic and radiation poisoning. The particles are so fine that they form a fume (like smoke) which can pass through gas mask filters.

The United Nations Environment Programme (UNEP) has found that DU munitions have the potential to contaminate soils and groundwater.² Laboratory studies show that health risks from DU inhalation may be underestimated;³ that DU in drinking water can disrupt hormones and fertility;⁴ that it may be present in urine 20 years after inhalation;⁵ and that it is a carcinogen which has been shown by US military researchers to cause

biological effects in mice.⁶ The evidence suggests that chronic exposure to DU munition residues has the potential to increase individuals' likelihood of developing a range of cancers.

DU is primarily an alpha particle emitter. Alpha particles can be easily stopped by the skin; however, when inhaled they can affect living tissue and blood cells. Alpha particles radiating from dust in vulnerable tissue can damage DNA, leading to cancer, birth defects and other health effects. Also, Uranium can bind chemically to DNA, causing further damage.

There have been numerous reports from Iraqi physicians of surges in certain cancers and birth malformations in areas where DU munition use was suspected.⁷ However, until full-scale epidemiological surveys are undertaken, it is impossible to make a direct link between these health problems and DU exposure. To date, these complex and crucial studies have been hampered by the breakdown in health administration during and after each conflict, the massive internal displacement of the population, ongoing security concerns, and obstruction from US authorities.

User Obligations

The UK, perhaps accepting the serious potential for harm, has demonstrated some responsibility over its use of DU in 2003 by providing the UN with coordinates of where munitions were fired. It also part-funded a UNEP-led capacity-building programme in southern Iraq.⁸ UNEP urged greater transparency over where DU munitions were fired and for the monitoring of public health in those areas.

The US has refused to release geographical data on its use of DU munitions in 1991 and 2003. As a result, at least 400 tonnes of DU munitions remain unaccounted for. This has major implications for clearance efforts and reducing the risk of civilian exposure. Unlike for cluster munitions and anti-personnel land mines, there is no legal obligation on states to release information on DU use to the international community.

Without expensive and difficult decontamination work often beyond the ability of states recovering from conflict, civilians and military personnel may be exposed to radioactive and toxic remnants of war. Unsurprisingly, public concern over the long-term impact of these munitions is particularly acute across the Islamic world.

A small minority of states is resisting international efforts to examine DU more closely. The group, led by the US, UK, France and Israel, claim that international organisations such as the World Health Organisation (WHO) and International Atomic

Energy Authority (IAEA) have examined this issue and have not been able to document long-term environmental or health effects attributable to the use of these munitions.⁹ Yet neither organisation has conducted the epidemiological studies on exposed civilian populations needed to determine the health risks.

In response to these growing concerns, the WHO and Iraqi Ministry of Health recently teamed up to examine congenital birth defects in six Iraqi governorates.¹⁰ Also, in April 2012 the UK-based International Campaign to Ban Uranium Weapons (ICBUW) (www.bandepleteduranium.org) and IKV Pax Christi in the Netherlands launched a project, funded by the Norwegian government, to assess the health and environmental impact of toxic substances released by military activities.¹¹

Why New Zealand Should Be Involved

The NZ Defence Force (NZDF) does not have any DU munitions. However, NZDF personnel returning from Afghanistan have had to provide urine samples for testing for Uranium levels.

Since 2004, the Christchurch-based DU Education Team (DUET) have been raising awareness in New Zealand about the “Agent Orange of the 21st century”, working closely with ICBUW. In 2005 DUET invited Dr Chris Busby, a UK specialist on DU and low-level radiation risks, to visit New Zealand. Dr Busby spoke at the Universities of Auckland and Canterbury, addressed the Royal Society in Wellington and met with MPs and staff from several government ministries. A particular goal, which arose during Dr Busby's visit, has been to seek more sensitive NZDF personnel urine tests, on which some progress was made.

In 2007, 136 states including New Zealand supported a UN General Assembly (UNGA) resolution accepting that use of DU munitions was a potential threat to health. Only five states voted against, including the US and UK.¹² In 2008, 94% of MEPs in the European Parliament strengthened four previous calls for a moratorium by calling for a DU ban treaty in a wide-ranging resolution.¹³ At the UN later that year, 141 states, again including New Zealand, supported a resolution asking for more studies into the effects of DU munition use.¹⁴ In 2010, New Zealand submitted one of 13 UN member states' reports to the UN Secretary-General.¹⁵

Adopting a precautionary approach in the face of scientific uncertainty, in 2009 Belgium became the first state to ban all aspects of conventional munitions containing Uranium.¹⁶ Belgian MPs had voted unanimously to ban the weapons two years earlier.

DUET organized a petition calling for the NZ Parliament to follow Belgium's example. Hearings were held by the Foreign Affairs, Defence and Trade Select Committee (FADTSC) in 2008, in which US epidemiologist Dr Rosalie Bertell and Belgian MP Dirk Van der Maelen testified by phonelink. Updated hearings were held in April 2009; but a disappointing report released on 24 June 2009 recommended no action. Subsequently, MPs in New Zealand, Costa Rica and Ireland began promoting similar domestic legislation; and on 27 April 2011 Costa Rica passed a ban.¹⁷ On 14 September 2010, Phil Twyford's Depleted Uranium (Prohibition) Bill was drawn in the ballot, and will receive its first reading on Wednesday 30 May 2012.

Ban on cluster munitions, and DU alternatives

New Zealand helped negotiate the 2008 Cluster Munitions Convention, and is a widely respected leader in nuclear disarmament with its pioneering nuclear free legislation.

Alternative materials for DU munitions exist based on tungsten, and are in use by the vast majority of US allies.¹⁸ ICBUW recently published a report, *Overstating the case*, examining the utility of DU versus alternatives.¹⁹ Australia stopped using DU munitions in 1990 because of health concerns.²⁰ (On 6 November 2011, an Australian Campaign to Ban Uranium Weapons was launched in Sydney.²¹) Like cluster bombs, DU munitions were developed with major land-based confrontations with Warsaw Pact armies in mind. DU munitions have since been used in heavily populated areas, and targets have diversified from armoured vehicles to include civilian infrastructure.

New UN General Assembly DU Resolutions

A new UN resolution was introduced at the 2010 UNGA Disarmament Session.²² *Inter alia*, it invited states to provide information on which DU munitions have been used, and where, to facilitate further research. The resolution was adopted by a huge majority, with only four states – the US, UK, France and Israel – voting against. No DU resolution was introduced at the 2011 disarmament session; however, one is planned for October 2012.²³ New Zealand should co-sponsor this resolution.

Phil Twyford's Private Member's Bill: A Precautionary Approach

Phil Twyford drew up his Bill after the 2009 FADTSC report in response to DUET's petition for New Zealand to follow Belgium's example failed to address the central concerns about the health effects of DU munitions. For example, the first FADTSC recommendation was for the NZDF to monitor the health of personnel who may have been exposed to DU ballast in A4-K Skyhawk aircraft. Yet the DUET petition, and Phil Twyford's Bill, only mention munitions and armour.

DUET strongly endorses a minority report by the Labour and the Green Parties that the Government should adopt a precautionary approach, as Belgium and Costa Rica have done, and introduce prohibition legislation. Similar legislation is under consideration in Ireland. DUET recommends, therefore, that Parliament should support New Zealand co-sponsorship of the 2012 UNGA DU resolution, and sending Phil Twyford's Bill to the FADTSC for consideration.

¹ KE Penetrator, http://en.wikipedia.org/wiki/Kinetic_energy_penetrator.

² UNEP, "Depleted Uranium in Bosnia and Herzegovina: Post-Conflict Environmental Assessment", p29, http://postconflict.unep.ch/publications/BiH_DU_report.pdf.

³ Monleau et al, "Genotoxic and Inflammatory Effects of Depleted Uranium Particles Inhaled by Rats", *Toxicological Sciences*, 2006; 89(1), pp289-295.

⁴ Raymond-Whish et al, "Drinking water with uranium below the US EPA water standard causes estrogen receptor-dependent responses in female mice", *Environmental Health Perspectives*, 2007, 115,1711-1716.

⁵ Parrish et al, "Depleted uranium contamination by inhalation exposure and its detection after ~20 years: Implications for human health assessment", *Journal of Science of the Total Environment*, 2008; 390(1), pp58-68.

⁶ Miller et al, "Leukemic transformation of hematopoietic cells in mice internally exposed to depleted uranium", *Molecular and Cellular Biochemistry*, 2005; 279, pp97-104. In February 2012 Dr Alexandra Miller published two new reports, "A Review of Depleted Uranium Biological Effects: In Vivo Studies" and one on *in vitro* studies, <http://www.bandepleteduranium.org/en/a-review-of-depleted-uranium-biological-effects-in-2>.

⁷ A recent example is Busby et al, "Cancer, Infant Mortality and Birth Sex-Ratio in Fallujah, Iraq, 2005-2009", *International Journal of Environmental and Public Health*, 2010, 7, 2828-2837, <http://www.mdpi.com/1660-4601/7/7/2828/pdf>.

⁸ UNEP, "Technical Report on Capacity-building for the Assessment of Depleted Uranium in Iraq", August 2007, http://postconflict.unep.ch/publications/Iraq_DU.pdf.

⁹ Explanation of vote, UNGA 2008, <http://www.bandepleteduranium.org/en/docs/80.pdf>.

¹⁰ Iraq congenital birth defect survey to begin in April, ICBUW, 29 March 2012, <http://www.bandepleteduranium.org/en/iraq-congenital-birth-defect-survey-to-begin-in-ap>.

¹¹ Toxic Remnants of War Project Launched, ICBUW, 11 April 2012, <http://www.bandepleteduranium.org/en/toxic-remnants-of-war-project-launched>.

¹² UNGA vote, 2007, <http://www.bandepleteduranium.org/en/a/152.html>.

¹³ EP Resolution, May 2008, <http://www.bandepleteduranium.org/en/a/181.html>.

¹⁴ UNGA vote, 2008, <http://www.bandepleteduranium.org/en/a/224.html>.

¹⁵ UN Secretary-General's Report , 14 July 2010, <http://www.bandepleteduranium.org/en/docs/140.pdf>.

¹⁶ Belgium Bans DU, <http://www.bandepleteduranium.org/en/a/118.html>.

¹⁷ Costa Rica bans depleted uranium weapons, 27 April 2011, <http://www.bandepleteduranium.org/en/a/407.html>.

¹⁸ For example see <http://www.defense-update.com/products/digits/120ke.htm>.

¹⁹ "Overstating the case: an analysis of the utility of depleted uranium in kinetic energy penetrators", ICBUW, <http://www.bandepleteduranium.org/en/overstating-the-case-an-analysis-of-the-utility-of>.

²⁰ Speech by Democrat Senator Lyn Allison, Canberra, 17 June 2003.

²¹ Launch of Australian Campaign to Ban Uranium Weapons, <http://www.bandepleteduranium.org/en/launch-of-australian-campaign-to-ban-uranium-weapo>.

²² UNGA Resolution A/C.1/65/L.19, <http://www.bandepleteduranium.org/en/docs/139.pdf>.

²³ Swedish campaigners focus on new DU resolution, 18 April 2012, <http://www.bandepleteduranium.org/en/swedish-campaigners-focus-on-new-un-resolution-on>.