

*“Depleted Uranium, like any other uranium compound, has both chemical and radiological toxicity.”
International Atomic Energy Agency*

Introduction

At the time of writing, our planet is under constant threat as a result of both natural and man-made disasters to which our mother earth and humans are exposed. Global warming and climate change, desertification and hunger, militarisation and war... all are serious threats against which urgent actions need to be taken in order to save humanity and our planet from disaster.

This booklet will focus on weapons and war, specifically depleted uranium weapons. Even though decision-makers strive to downplay the health and environmental risks that are posed by these weapons, we aim to show the reality of their harmful nature and the damage that they cause.

What are Depleted Uranium (DU) weapons?

Depleted uranium weapons are munitions which have been moulded from U238 (the remains of the uranium enrichment process) or are conventional munitions which have been coated with the same substance. U238 has almost the same level of radioactivity as natural uranium and a half-life of over 4.5 billion years. These highly toxic armour-piercing munitions are usually fired from tanks and aircraft guns.



*The USA M1A1 / M1A2 Abrams Main Battle Tank*¹

Because of its high density (70% denser than lead), depleted uranium can equip munitions with an increased range and an infallible penetrative power. Therefore, despite their highly damaging nature these weapons have been utilised by many states in a bid to maintain their military supremacy. Upon detonation, a depleted uranium weapon produces excessive heat, fire, smoke and uranium oxide dust which then disperses into the atmosphere.

What is depleted uranium?

Depleted uranium is a byproduct of the process of making enriched uranium. The technology isolates the uranium-235 needed for nuclear reactors and warheads and discards uranium-238 (depleted uranium).

Centrifuge process

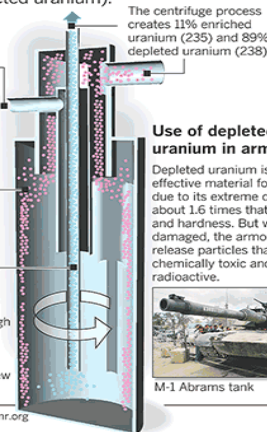
Natural uranium ore is ground, treated and converted into a gas.

The uranium gas is pumped into a cylinder that rotates at twice the speed of sound.

The heavier of the two isotopes, **uranium-238**, is drawn against the sides of the centrifuge cylinder . . .

. . . separating it from the lighter **uranium-235**.

The uranium passes through hundreds of centrifuges to refine it further. A single centrifuge cylinder is typically 6 feet tall and a few inches in diameter.



The centrifuge process creates 11% enriched uranium (235) and 89% depleted uranium (238)

Use of depleted uranium in armor

Depleted uranium is the most effective material for tank armor due to its extreme density – about 1.6 times that of lead – and hardness. But when damaged, the armor may release particles that are chemically toxic and radioactive.



M-1 Abrams tank

Use of depleted uranium in munitions

Depleted uranium's density and hardness also make it a choice for weapons to tear through enemy targets and burst into flames on contact. Scientists worry that battlefield remnants of depleted uranium could cause health problems in both U.S. military personnel and Iraqi civilians.



Rounds fired by the M-1 Abrams tanks, for example, contain about 9 pounds of depleted uranium. As the weapons pierce armor, small bits of depleted uranium ignite.



Depleted uranium penetrator with stabilizing fins

Exposure to depleted uranium

U.S. military sources say the effectiveness of weapons and armor made with depleted uranium outweighs the risks of exposure. Opponents disagree. There are three ways people could become exposed to depleted uranium in areas where it has been used in combat:



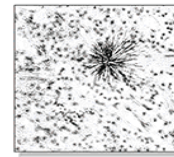
Ingestion
If drinking water or food became contaminated with depleted uranium or if children eat affected soil.



Inhalation
Small particles of depleted uranium could be inhaled if disturbed and lifted into the air or carried in the wind.



Skin contact
It could enter the bloodstream open wounds or from embedded depleted uranium shrapnel.



Cancer risk

Fears of cancer from exposure to depleted uranium are related to its radioactivity. The black star at left shows tracks made over 48 hours by alpha rays emitted by a radioactive particle lodged in an ape's lung tissue. (The particle is invisible.) Damaged cells can become cancerous.

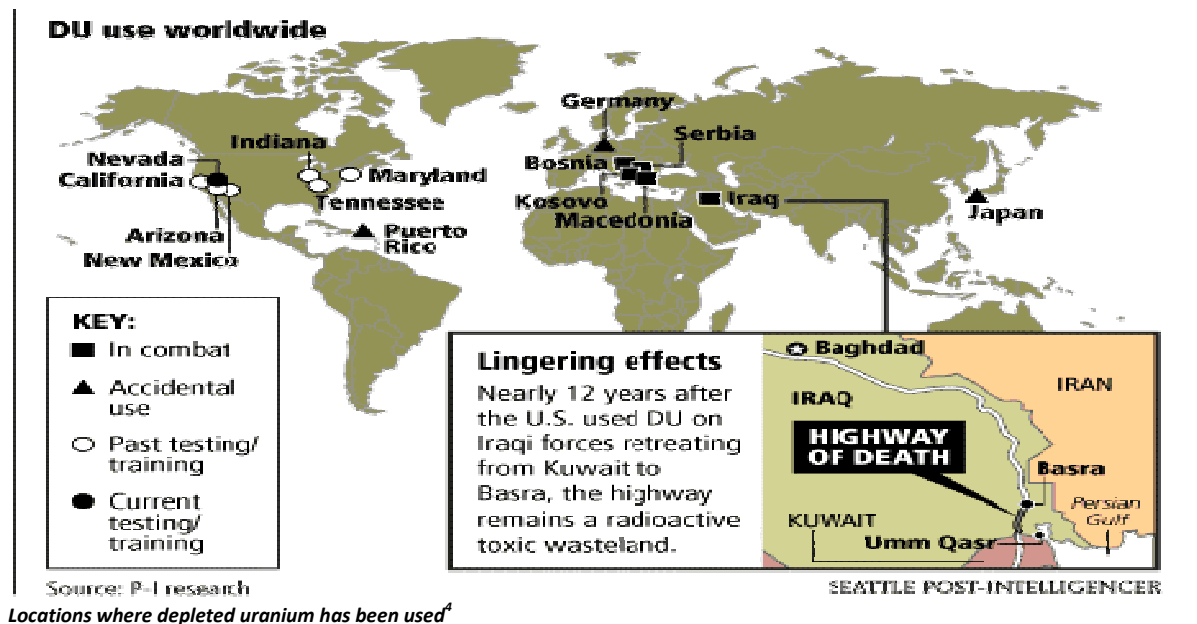
SOURCES: Associated Press; ccnr.org

News-Journal

Additional information on depleted uranium²

The Use of DU and Its Effects

Depleted uranium weapons have been produced, tested and used during warfare in various parts of the world resulting in extensive damage and long-term adverse ramifications. They were deployed during the wars in Iraq in 1991 and 2003, the war in Afghanistan in 2002 and during the NATO bombings of Serbia in 1999. Huge amounts of these munitions were deployed in the aforementioned wars with over 2,500 tonnes being used in Iraq, over 1,000 tonnes being used in Afghanistan and an additional 84 tonnes being used in Eastern Europe.³ The following map illustrates the locations where DU has been used.



The health and environmental implications of DU weapons are unpredictable, technically challenging to demonstrate and financially expensive to mitigate despite the fact that the US military itself has acknowledged their dangers within its internal record. A comprehensive report to the Pentagon stated that there was evidence to suggest an increase in the rate of cell damage and cancer in the areas where DU had been used and that lung damage was also ‘well documented’.⁵ The victims in question are unarmed civilians, humanitarian workers, peacekeepers and war veterans.

Health Risks:

Approximately 70% of the depleted uranium that is inhaled escapes into the blood stream which can have an adverse affect on the lungs, the blood, the lymph nodes, the reproductive organs and other organs. DU is insoluble which means that it lodges in the body tissue and cannot be excreted.⁶ Here are some of the health implications which have been documented:

1. Birth defects in newborns
2. Chromosomal abnormalities
3. Cancers
4. Kidney dysfunction
5. Lung disease
6. Damage to the nerves and brain
7. Blood and circulatory disorders
8. Endocrine system disorders
9. Neurological and neuromuscular diseases
10. Low sperm count
11. DU in the urine and semen
12. Joint pain and stiffness
13. Digestive problems

14. Chronic fatigue
15. Inability to sleep
16. Memory loss
17. Anxiety and depression

Environmental Risks:

The manufacture, handling, stocking, transporting and use of depleted uranium weapons pose numerous environmental risks also.⁷ They include:

1. Surface and ground water contamination
2. Breathing air contamination
3. Soil contamination
4. Loss of biodiversity

Many of the above enumerated risks have already been exposed in different parts of the world. The following is the testimony of a US veteran of the recent war in Iraq which details the side-effects that he is experiencing after his exposure to DU:

"I got hurt early in the tour and my left side just became paralysed...I'm on 40 mg of Methadone every six hours, 45 mg of Morphine every eight hours, 4 mg of Tizanidine every four hours and those are just the pain medications. I'm on such a high dose of Methadone and Morphine that it causes erectile dysfunction so now they've got me on Viagra. It also causes constant constipation so I have to take a laxative every two or three days. It's just one thing after another. My joints ache, my left side is still numb, my left leg and hand are numb and tingle. I've been diagnosed with nerve damage, post-traumatic stress disorder, sleep apnea which means that I have to wear a respirator mask at night to help me breathe because the stuff did something to my lungs. I am just in constant pain. I still have the blood in my urine and in my stool. I also had a tumour around my thyroid when I was at Walter Reed which I complained about repeatedly...I am classified as totally disabled and am unable to work."⁸

More and more can be written in line with the above testimony. During the first Gulf War and the Balkans conflict, American and British troops used DU in their armour-piercing rounds to disable enemy tanks and although the subsequent human and environmental ramifications have been downplayed and labelled as uncertain by some decision-makers, they have in actual fact proven to be devastating.

In this respect, the condition known as 'Gulf War Syndrome' which has been affecting US and British war veterans (of which depleted uranium is believed to be one of the main causes) is a source of grave concern. It affects at least one third of the 697,000 US veterans who served in the 1990-1991 Gulf War.⁹ The symptoms of this syndrome include leukemia and motor neuron disease along with memory loss, chronic fever, laboured breathing, headaches, aching muscles, weight loss and skin rashes. There is substantial testimony to suggest that veterans of the Balkans War are suffering similar DU side effects to those of Gulf War veterans.¹⁰ In Italy, for example, it has been revealed that hundreds of military personnel that served in both conflicts have succumbed to cancers. Subsequent to these revelations, the Italian Government agreed to sanction a €170 million compensation package for the soldiers in question and their families.¹¹

The two wars in Iraq are pertinent examples of the horrific damage that is caused by depleted uranium weapons, the results of which were identified within six years of the first conflict (five to six years being the incubation period for depleted uranium). In a study conducted by Dr. Ahmad Hardan, a former special scientific adviser to the World Health Organization, the United Nations and the Iraqi Ministry of Health, there was a notable increase in cancer of the blood, the lungs, the digestive system and the skin in the years after the first Gulf War.¹² The dangers are also illustrated by a notable increase in the incidence of congenital diseases and foetal deformities such as the existence of additional abnormal organs, abnormal enlargement of the brain, excessive cerebrospinal fluid around the brain, anencephaly, eye disease and even the total absence or deformity of the eyes.

Vietnam and Gulf War veteran Doug Rokke received a PhD in physics after he retired from the US Air Force and was chosen to lead a team of experts into Iraq after the first Gulf War to confirm the destructive power of depleted uranium and to collect contaminated tanks for testing. After his prolonged exposure to this toxic environment, Rokke was diagnosed to be dying of depleted uranium poisoning whilst several other members of his team died as a result of lung disease and various cancers. Keeping himself alive with extensive medication, Rokke now travels the world campaigning for a comprehensive ban on depleted uranium.¹³

According to Dr. Leurent Moret, an independent scientist and international expert on radiation and public health issues, approximately 7-10 babies per day are being born with birth defects in Iraq as a result of the country's DU contamination whilst cancer has been 'spreading like wildfire'.¹⁴ In addition, symptoms such as severe vertigo, nausea and a loss of balance, an increase in sterility among both sexes and an increase in the rate of miscarriages and premature births are all a testament to the damage caused by DU. These health hazards have been on the increase in Iraq since the outbreak of the first Gulf War which was the first war in which depleted uranium weapons were deployed.



An example of the birth defects and deformities emerging in Iraq after the use of DU there¹⁵

Food that was grown in contaminated areas was transported to the cities of Iraq which occurred in conjunction with the contamination of the countries water supply. Along with the human health dangers, the contamination of water, air and soil poses a threat to the natural world and to biodiversity. It is highly probable that future research will reveal even further damage which has been caused by the use of DU munitions during the latest incursion into Iraq as well as additional conflicts around the world. Additionally, it is suspected that depleted uranium weapons are being used in the current military strikes aimed at ousting the regime of Colonel Gaddafi in Libya. When asked to confirm or deny this during Prime Ministers Questions in the House of Commons, David Cameron chose to coat his response in ambiguity.

It can take merely seconds for the deadly payload within DU shells to spread into the environment. However, considering the difficulties linked with their clearance and contamination in post-war countries, depleted uranium looks set to cause continued harm to humanity in the coming decades and centuries.

The aforementioned difficulties include:

1. The shortage of information and transparency in relation to contaminated areas.
2. The high cost of the clean-up process and the lack of the financial will to conduct it.
3. The shortage or lack of specialised personnel and advanced equipment required for the testing of potentially contaminated areas and individuals.
4. The unavailability of equipment to distinguish between natural uranium and depleted uranium.
5. The failure to remove all the penetrators from the locations in question.
6. DU contamination of the soil and ground water in the relevant areas.

Legal Matters:

Breaches of International Law:

In light of the above risks and threats posed by DU, their use in warfare is in breach of the general principles of International Humanitarian and Human Rights Law. International Humanitarian Law prohibits widespread damage to the natural environment and the use of poisonous weapons. Moreover, it requires the belligerents to minimise the effect that their military activities have on civilians. It also requires belligerents to distinguish civilians and civil objects from combatants and military targets. Furthermore, in terms of International Humanitarian Law, the principle of proportionality states that any military attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects or which would be excessive in relation to the concrete and direct military advantage anticipated is strictly prohibited.

Under the International Human Rights Law body, specifically in terms of the International Covenant on Economic, Social and Cultural Rights, all states which are party to Conventions and Treaties are required to respect and protect the rights of all people. Everybody has the inherent right to the highest attainable standards of physical and mental health and the right to a clean, healthy and sustainable environment. This underlines the prohibition within International Humanitarian Law to put the health or survival of the population at risk by employing methods or means of warfare which are intended, or may be expected, to cause widespread and long-term damage to the natural environment.

Considering the above breaches of International Humanitarian and Human Rights Law, as well as the risks taken and the damage caused by the use of depleted uranium, no effort should be spared to ban them. Urgent action towards the ban should be taken by relevant, primary and competent actors.

Steps Taken Towards a Ban:

At the United Nations level, numerous conventions for the regulation of various types of weaponry have been enacted and are now in force but there is neither a convention nor a treaty in relation to depleted uranium weapons. The United Nations General Assembly has produced several resolutions on depleted uranium weapons; one in 2007 which recognised their potential harmful effects and another in 2008 which reiterated this recognition and called for more research in the affected areas. In addition, the UN voted for another resolution in October 2010 calling on the states deploying DU weapons to release quantitative and geographical data about their use to the authorities of the affected states. Even though these resolutions have been opposed by countries like the US, the UK, France and Israel, they underline the positive steps which have been taken by the UN on the DU issue.

Unfortunately, in the context and the process of International Law, resolutions are not legally binding. Moreover, the harmful effects of depleted uranium munitions remain highly disputed in the community of states and no definitive conclusion has been drawn to date. The existence of this status quo, usually maintained by the powers that own and use depleted uranium weapons, means that humanity will be at the mercy of their lethal consequences for the foreseeable future.

Therefore, a legally binding International Treaty should be enacted, signed, ratified, and enforced.

Despite the United Nations' indecisive position on depleted uranium, some regional entities have taken significant steps towards their ban. In 2001, the EU Parliament called on the member states of NATO to place a moratorium on the use of DU munitions which was followed by similar calls in 2005 and 2006. Indeed, in 2007 the European Military Union urged the relevant governments to cease their use of depleted uranium. Even though these calls for a moratorium are not treaties to ban the use of these nefarious weapons, they represent significant steps that have been made by the bodies representing inter-state governance. Concordantly, similar action was initiated in Latin America in 2009 when the Parlatino (Latin American Parliament) considered resolutions for the banning of DU weapons.

Along with these regional initiatives, individual states have also made notable strides towards banning DU. In 2007 Belgium became one of the first states to enact laws banning the manufacture, possession, testing, use or sale of depleted uranium weapons. In January 2010, Costa Rica passed legislation banning the production of depleted uranium weapons in its free trade zone and has a further two relevant bills under consideration. In addition, significant moves towards similar laws are ongoing in both Ireland and New Zealand.

Banning Depleted Uranium Weapons in Ireland:

The Irish Government played a leading role in the international processes that brought about the 1997 Landmine Ban Treaty and the 2008 Convention on Cluster Munitions. We urge the Government to take a similarly clear and unambiguous position on depleted uranium weapons by enacting legislation to ban their production, use, stockpiling and trade.

But steps in this direction are already underway. In the summer of 2009 Afri invited Doug Weir, Coordinator of the International Coalition to Ban Uranium Weapons (ICBUW), to speak on the issue at a public meeting in Dublin.¹⁶ Whilst here, Doug met with Senator Dan Boyle who agreed to submit a private members Bill on the Prohibition of Depleted Uranium Weapons. The Bill completed the different stages of the legislative process in the Seanad in November 2010 and is due to be introduced to the Dáil at the time of the publication of this booklet.

This Prohibition of Depleted Uranium Weapons Bill recognises the potential harm that can be caused from exposure to depleted uranium's radioactivity and chemical toxicity. The new Government must follow through on the policies that were initiated by the previous administration in relation to this issue.

Conclusion:

Sadly, the adverse effects of depleted uranium weapons are still highly disputed despite the growing dossier of evidence proclaiming the lethal implications of their use. The time spent debating and downplaying this issue shares a resonance with the Russian Government's initial state of denial over the extent of the Chernobyl Disaster in 1986. In hindsight, the valuable time that was wasted in the crucial days after the plant explosion would have been better spent evacuating the area but this did not happen. The result was the lethal exposure of thousands of civilians and we face a moment of similar urgency now. The world must learn from its previous mistakes and ban DU weapons immediately. As a country which claims to be neutral, Ireland (along with Belgium and other peace loving countries) is well placed to show international leadership on the DU issue by passing the new legislation without delay.

T.D.s must act swiftly to ensure the prompt enactment of a national ban on depleted uranium weapons. THE TIME IS NOW!

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- ¹ As found at <http://www.army-technology.com/projects/abrams/abrams9.html>
- ² Picture from <http://www.internationalpeaceandconflict.org/>
- ³ <http://www.bandepleteduranium.org/>
- ⁴ This map can be found at EJN website (<http://www.energyjustice.net/nuclear/du/>)
- ⁵ This report has been cited by Dr. Doug Rokke who was head of the Pentagon's Depleted Uranium Project
- ⁶ From Dr. Leurent Moret who is a well respected bio scientist and an expert in the field of radiation
- ⁷ For more information on these risks, see for example Gretel Munroe, "Health Effects of Depleted Uranium", The International Coalition to Ban Uranium Weapons, at <http://www.bandepleteduranium.org/en/docs/8.pdf>
- ⁸ See Dinyar Godrej, "Depleted Uranium: The Poisoned legacy" New Internationalist, Issue 406 November 2007, pg.12-13
- ⁹ *Blowin' In The Wind*, Frontline Films
- ¹⁰ <http://www.wsws.org> Italian, French, Belgian and Portuguese veterans have succumbed to leukemia and cancers
- ¹¹ <http://www.bandepleteduranium.org/en/a/154.html>
- ¹² This research can be found on the following link: http://www.iacenter.org/depleted/du_iraq.htm
- ¹³ <http://www.informationclearinghouse.info>
- ¹⁴ Dr. Leurent Moret, Independent Bio Scientist
- ¹⁵ Pictures from <http://www.bandepleteduranium.org/>
- ¹⁶ Afri is a peace, justice and human rights organisation. For more information, visit www.afri.ie. For additional information on the Coalition to Ban Uranium Weapons, see <http://www.bandepleteduranium.org/>