Proposal to Enhance and Expand
The Depleted Uranium Follow-up Program

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OVERVIEW

This paper is intended to generate discussion within the VA about the Depleted Uranium (DU) Follow-up Program (hereafter the "DU Program"). Its purpose is to serve as the start of a dialogue about the function and purpose of the current DU Program, and ways in which the program can be improved. The premise of this paper is that a project based on health questionnaires and optional medical examinations will provide more useful data, and consequently improve the VA's delivery of services to veterans, than the current program's provision of costly and detailed medical examinations to only a few dozen veterans.

The primary goal of an enhanced and expanded program is to improve the delivery of health care and benefits to veterans of the Gulf War and other conflicts in which depleted uranium munitions are used. The most important contribution of a monitoring and evaluation system is to consistently improve ongoing operations by keeping abreast of major trends in the program and by regularly reporting to and advising VA management.

Four facts illustrate the need for improving the current DU Program:

1) The DU Program is having difficulty convincing a few dozen veterans to travel to Baltimore to undergo days of extensive medical testing.
2) When the recent DU controversy erupted in Europe, NATO nations undertook health assessments of tens of thousands of soldiers who served in areas where DU munitions were used. By contrast, the VA's DU Program has assessed the health of only 63 veterans, even though the Pentagon admits thousands of Gulf War veterans may have been exposed to depleted uranium.
3) The 63 veterans examined by the DU Program were probably among several hundred Gulf War veterans most heavily exposed to depleted uranium, but they represent too small a sample for findings on their health status to have significance and applicability for all exposed veterans.
4) The DU Program remained silent when the Department of Defense made false claims about the existence of cancers among the veterans in the program, raising concerns about the politicization and transparency of the DU Program.

For these reasons, the VA should enhance and expand the DU Program to ensure the continued delivery of high quality services to Gulf War veterans, and to provide timely and useful information about depleted uranium to veterans and their families, VA physicians, and federal investigations.

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BACKGROUND

During the 1991 Gulf War, US Abrams tanks fired DU rounds at occupied US vehicles, destroying or damaging 6 M1/M1A1 tanks and 14 Bradley Fighting Vehicles. 104 soldiers survived these attacks; 11 soldiers died. (OSAGWI, 2000) Despite the existence of Army regulations calling for the immediate medical testing of soldiers wounded by or otherwise exposed to depleted uranium, none of the friendly fire survivors was tested until two years after the war.

In addition, hundreds of Iraqi tanks, armored personnel carriers, and other equipment were struck by depleted uranium ammunition. The impacts of DU rounds create localized areas of contamination by a fine depleted uranium dust, which may be inhaled or ingested. During and after the war, tens of thousands of U.S. troops moved freely through battlefield areas, and many report climbing on and entering destroyed vehicles that may have been contaminated with depleted uranium dust.

In 1993 the General Accounting Office completed an investigation of the Army's handling of depleted uranium and recommended "the testing of all crew members inside vehicles penetrated by DU munitions." (GAO, 1993) The Department of Defense concurred with GAO's recommendation and helped the VA establish the DU Program to identify and examine Gulf War veterans exposed to depleted uranium in friendly fire incidents. The Army Surgeon General's Office provided Dr. James Keogh, first director of the DU Program, with a list of 68 friendly fire veterans. Dr. Keogh apparently believed this list represented *all* crew members inside vehicles penetrated by DU munitions, in accordance with the GAO recommendation. (McDiarmid, 1997) The DU Program contacted 48 individuals, and 33 enrolled and were examined in 1993/1994. (Hooper, 1999)

In 1995, the DU Program collected urine samples from 20 of the original 33 participants in the DU Program; no medical examinations were provided to these veterans at that time. (Hooper, 1999) In 1997, the DU Program examined 29 of the original 33 participants at the Baltimore VAMC. (McDiarmid, 2000)

In 1998, the Pentagon's Office of the Special Assistant for Gulf War Illnesses (OSAGWI) surprisingly acknowledged "thousands" of Gulf War troops may have been exposed to depleted uranium as a result of unprotected contact with contaminated equipment. (OSAGWI, 1998). A few months later, OSAGWI also increased to 113 the number of friendly fire veterans exposed to depleted uranium; upon further investigation this number was lowered to 104. (Rostker, 1998; OSAGWI, 2000) Beginning in 1998, OSAGWI and the DU Program tried to contact and enroll additional friendly fire veterans into the program.

As part of its expanded outreach efforts, in November 1998 OSAGWI interviewed a friendly fire veteran who had recently been discharged from the Army because he had cancer.[1] The interview report also indicates the veteran was interested in enrolling in the DU Program (presumably he was not among the original 33 veterans in the program).

[1] See OSAGWI, "Interview of loader for A-14," Lead Sheet #18932, 4 November 1998. http://www.gulflink.osd.mil/du_ii/du_ii_refs/n52en376/8244_006_0000002.htm

In 1999, the DU Program examined 51 veterans; 21 of the original 33 veterans, plus 30 veterans who had never been examined by the DU Program. Of the 51 veterans examined, one veteran had Hodgkin's lymphoma.[2] A second veteran had a bone tumor in his left arm, near where he was wounded by DU fragments.[3] Because only 51 veterans were examined, it is difficult to assess the significance of the finding of lymphoma and a bone tumor for other veterans exposed to depleted uranium.

Between August 1998 and December 1999, the DU Program collected urine samples from 169 Gulf War veterans for determination of urinary uranium concentration. These veterans also filled out an exposure assessment questionnaire, but this questionnaire did not include any questions about the veterans' health status. (VA, 1998) The urine testing found "only the presence of retained DU shrapnel was predictive of an elevated urine uranium level." (McDiarmid, 2001)

Based on the 1998/1999 urine tests – which were conducted without any assessment of the health status of the veterans tested – Dr. McDiarmid states that Gulf War veterans who were not wounded by DU fragments are unlikely to suffer any adverse health effects. (McDiarmid, 2001) Assuming this conclusion is correct, there does not seem to be any further need to spend the VA's resources flying veterans to Baltimore for testing and evaluation. Nonetheless, in 2001, the DU Program plans to fly a few dozen veterans to Baltimore for several days of testing.

In January 2001, Dr. Fletcher Hahn reported on the findings of a U.S. Army-funded depleted uranium study at the VA's Gulf War research conference in Alexandria, Virginia. The research conducted at the Lovelace Respiratory Research Institute in Albuquerque, New Mexico found depleted uranium fragments caused soft tissue sarcomas in the muscles of rats. (Hahn, 2001) The scientists who conducted the study have recommended further studies to assess the implications of the study findings for humans.

There is no longer any question whether depleted uranium can cause cancer; the question now is whether any Gulf War veterans internalized enough depleted uranium to cause cancer. As long as the DU Program examines only a few dozen of the thousands of potentially exposed veterans, the VA and federal investigators will remain unable to honestly answer this question.

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[2] OSAGWI, "Meeting with Dr. Melissa McDiarmid and her staff on October 15, 1999 to discuss the Baltimore DU Follow-Up Program and the Extended Follow-Up Program," undated. http://www.gulflink.osd.mil/du_ii/du_ii_refs/n52en651/0089_005_0000001.htm This document confirms that one veteran had lymphoma, but Dr. McDiarmid stated it was a Hodgkin's Lympoma during a phone conversation with the author on February 12, 2001. It is not clear if this veteran is the same veteran who was discharged from the Army because he had cancer.

[3] The Department of Veterans Affairs and the Office of the Special Assistant to the Secretary of Defense for Gulf War Illnesses, Medical Readiness, and Military Deployments acknowledge the existence of the bone tumor in one veteran. The VA's DU Program states the tumor was benign, but the tumor is not formally documented in a publicly released document. The bone tumor has been reported in the Hiroshima, Japan newspaper Chugoku Shimbun (4/4/00): http://www.chugoku-np.co.jp/abom/uran/us_e/000404.html.

BENEFITS OF CURRENT DU PROGRAM

The DU Program has provided a valuable service to the 60 or so veterans it has examined, and it has contributed to the body of knowledge about Gulf War veterans' illnesses. Test data from the veterans examined by the DU Program has formed the basis of five peer-reviewed reports published in scientific journals. (McDiarmid, 2001; McDiarmid, 2000; Ejnik, 2000; Hooper, 1999; McDiarmid, 1999) The DU Program also developed an excellent DU exposure assessment questionnaire with 30 separate questionnaire items condensed into 19 distinct exposure scenarios. (VA, 1998)

SHORTFALLS OF CURRENT DU PROGRAM

Despite the valuable service the DU Program provides to Gulf War veterans, the program is increasingly having trouble convincing friendly fire veterans to travel to Baltimore to undergo several days of medical testing and evaluation. Of the 33 veterans initially enrolled in the DU Program, only 21 showed up to be evaluated in 1999, for reasons including a lack of interest in traveling to Baltimore for several days. Only approximately half of the known friendly fire veterans (most were not contacted until 1998-99) have agreed to participate in the DU Program. Indeed, Dr. McDiarmid, the current director of the DU Program, recently remarked: "It seems that those who were NOT exposed are more upset about this than those who were."

The small number of veterans examined by the DU Program limits the significance and applicability of health outcomes findings to the larger veteran population. The DU Program is in fact not considered a proper scientific study precisely because so few exposed veterans have been examined. Only a total of 63 friendly fire veterans have been examined during the eight years of the DU Program's existence, and virtually none of the other roughly 800 veterans in OSAGWI's top two exposure classification levels have been examined or interviewed by the DU Program to determine if they suffer any adverse health effects possibly related to their exposure. In addition, OSAGWI lists as "unknown" the number of soldiers, sailors, airmen and marines who entered DU-contaminated equipment or were exposed to smoke during the Doha, Kuwait munitions fire – none of whom have been examined by the DU Program. (OSAGWI, 2000)

The 63 veterans who have been examined were probably among the most heavily exposed, but they represent too small a sample for findings on their health status to have significance or applicability for the thousands of veterans the Pentagon now admits were potentially exposed to depleted uranium.

Perhaps the clearest sign of the need for reform is the politicization of the DU Program. In January 2001, concern over depleted uranium (DU) ammunition used by US forces in Bosnia and Kosovo swept across Europe. Initial concerns focused on the possible connection between depleted uranium and the leukemia and cancer deaths of several European peacekeepers. As the controversy intensified, other issues were raised, such as NATO's failure to issue warnings to civilians about contaminated sites, and the presence of plutonium in DU munitions.

The Pentagon responded to the DU crisis by dispatching several spokesmen to NATO headquarters. At a January 10 press conference in Brussels, Pentagon spokesman Dr. Michael Kilpatrick misrepresented the health status of the veterans in the DU Program in

an attempt to allay concerns about DU: "We have seen no cancers or leukemia in this group, which has been followed since 1993." His unchallenged statement was repeated indirectly in several press stories and scientific articles discounting health concerns about depleted uranium, and has become a mantra at the Pentagon and NATO headquarters ever since.

Contrary to DoD claims, of the 51 veterans examined in 1999, one had a bone tumor and one had Hodgkin's lymphoma. The veteran who developed the bone tumor was wounded by DU fragments, and he also likely inhaled and ingested DU dust. To its credit, the VA paid in full to remove the bone tumor from the afflicted Gulf War veteran, even though the veteran is not service connected for this disability. The veteran who developed Hodgkin's lymphoma was wounded when his tank was penetrated by a DU round, but it is not clear if he had been wounded by depleted uranium. This veteran likely inhaled and ingested large amounts of depleted uranium dust when his tank was hit.

Curiously, Dr. McDiarmid has not publicly disclosed the finding of lymphoma and a bone tumor among the 51 veterans she examined in 1999, even though she published two reports about depleted uranium in scientific journals this year. In an interview with the author, Dr. McDiarmid stated she does not believe the tumor or the lymphoma was caused by the veterans' exposure to depleted uranium, but in the absence of any published data on her findings, it is difficult to assess the validity of her statement. At the January NATO press conference, however, neither Dr. Michael Kilpatrick nor other Pentagon spokesmen offered any qualification for their remarks: they simply denied there have been *any* cancers among the veterans in the DU Program.

Neither Dr. McDiarmid nor the VA has made any effort to publicly correct the Pentagon's false claim about the health of veterans in the DU Program.

In a carefully worded commentary in the January 20, 2001 edition of the British Medical Journal, Dr. Melissa McDiarmid reported that none of the 15 veterans who retain DU fragments "has leukaemia, bone cancer, or lung cancer." (BMJ, 2001) In the context of the controversy which prompted Dr. McDiarmid to submit a commentary to the British Medical Journal, the failure to acknowledge the lymphoma and bone tumor among the 36 other veterans examined in 1999 (who did not retain DU shrapnel at that time) is inexplicable. Similarly, in Dr. McDiarmid's March 2001 article in *Health Physics*, she fails to mention the lymphoma or bone tumor, though she does confirm other minor DU-related health effects among veterans in the DU Program. (McDiarmid, 2001) At a time when the Department of Defense was marshalling its resources to squash European concerns about depleted uranium, Dr. McDiarmid's omission is particularly unsettling.

In March 2001, the Italian Defense Ministry released the results of a government study which found lower than expected numbers of non-lymphatic cancers among 39,450 soldiers who served in Bosnia (1994-95) and Kosovo (1999). However, the Italian study found higher than expected rates of lymphatic cancers including Hodgkin's lymphoma and acute lymphatic leukemia. The Defense Ministry stated the increase in lymphatic cancers was not statistically significant, and it denied finding evidence of a link between DU exposure and the cancers. (BBC, 2001; AP, 2001) Other NATO nations have

similarly undertaken health assessments of thousands of soldiers who might have been exposed to depleted uranium.

Whether intentional or not, the DU Program has become used as a political tool by the Pentagon to downplay concerns about depleted uranium. The VA's silence in the face of the Pentagon's false statements about the existence of cancers among the veterans in the DU Program represents a politicization that ill serves the veterans in the study or the "unknown" number of other veterans who were potentially exposed to DU during and after the Gulf War.

Considering the declining interest among friendly fire veterans to participate in lengthy examinations in Baltimore, the limited utility of a study of so few exposed veterans, and the politicization of the DU Program, the Department of Veterans Affairs should improve the DU Program in a way that both saves resources (money and staff) and improves the deliver of services to veterans.

PROPOSAL FOR A DEPLETED URANIUM EVALUATION AND MONITORING PROJECT

The Department of Veterans Affairs should shift its focus from an intensive study of a small number of veterans to a more comprehensive look at a larger number of veterans. Rather than provide costly medical follow-up examinations every two years to only a few dozen veterans, the VA should use annual health questionnaires to assess several hundred to several thousand veterans who were likely exposed to depleted uranium during and/or after Operation Desert Storm. If the health questionnaires raise any red flags, such as clusters of diseases, the VA could then selectively examine individual veterans at the VAMC closest to the veteran (to save the cost of flying the veteran to Baltimore) to assess any possible relationship to depleted uranium. The DU Program in Baltimore could send out and assess the results of the health surveys, and coordinate any necessary medical examinations with local VAMCs.

The mission of a streamlined evaluation and monitoring project would essentially mirror that of the current program: to monitor the health of veterans exposed to depleted uranium, and to create data useful to federal investigations of depleted uranium and Gulf War veterans' illnesses. The health survey should elucidate information about the health status of veterans and their offspring. The questionnaire should ask specific questions about respiratory and kidney effects, plus diseases in the four categories of concern identified by Armed Forces Radiobiology Research Institute: cancer, immunotoxicity, neurotoxicity, and male and female reproductive effects. (AFRRI, 1999) This questionnaire should be sent on an annual basis to a statistically significant number of Gulf War veterans representing the range of possible exposure scenarios.

OSAGWI's December 2000 report "Depleted Uranium in the Gulf (II)" classifies possible DU exposures into three levels (I, II and III), encompassing 13 separate activities or incidents, shown in Table 1. Given the absence of information about veterans' actual battlefield exposures, these levels are theoretical and may be highly subjective. However, they provide a basis for identifying units and individuals who should be contacted as part of the evaluation and monitoring project:

Table 1. Incident Summary

(Reprinted from OSAWGI's Dec. 2000 report "Depleted Uranium in the Gulf (II)")

Exposure Classifications: Levels and Scenarios	Number of Persons	Personal Protection Worn
Level I		
Soldiers in or on a US vehicle when a DU munition penetrated it.	104	None
Soldiers who entered US vehicles to rescue occupants immediately after friendly-fire DU impacts.	» 30-60*	None
Level II		
Explosive Ordnance Disposal (EOD) and unit personnel who removed equipment and munitions from US vehicles struck by DU munitions.	» 10-20*	None
Unit personnel who performed maintenance on or recovered items from US vehicles struck by DU munitions.	» 60-80*	None
Logistics Assistance Representatives (LARs) who inspected US vehicles struck by DU munitions to determine reparability.	» 6-12*	Some Wore PPE**
Battle Damage Assessment Team (BDAT) members who examined US combat vehicles damaged and destroyed by DU munitions.	16	Most Wore PPE**
144th Service and Supply Co. personnel who processed damaged equipment, including some struck by DU munitions.	29	None
Radiation Control (RADCON) team members.	11	Most Wore PPE**
Personnel exposed to DU during cleanup operations at Camp Doha's North Compound.	» 600*	None
Level III		
Personnel exposed to smoke from burning DU rounds at Camp Doha.	Hundreds	None
Personnel exposed to smoke from burning Abrams tanks.	Unknown	None
Personnel who entered DU-contaminated equipment.	Unknown	None
Personnel exposed to smoke from Iraq's DU-struck equipment.	Unknown	None

* Number is not final; remains under investigation.

** Personal Protective Equipment (PPE) includes respirator, coveralls, boots and gloves. Reports of respiratory protection ranged from the military M25 and M17A2 respirators to industrial dust mask, surgical-type paper mask, etc.

The health questionnaire should be sent to all of the roughly 900 veterans in levels I and II. In addition, the exposure assessment questionnaire should be sent to a statistically significant number of veterans who served in infantry, armor, artillery, medical and support units to who may have had exposures categorized as level III. After the exposure questionnaires have been analyzed, the health questionnaire should then be sent to all veterans in level III who might have been exposed.

The VA should make an extra effort to clearly explain the importance of completing and returning the surveys to the veterans it contacts. The information gathered could directly improve the delivery of health care and benefits to veterans of the Gulf War and other conflicts in which depleted uranium munitions are used. Conversely, the health questionnaires may demonstrate that veterans experience few or no health problems related to depleted uranium. In any event, the VA will have a better understanding of the health of units and individuals with known or suspected exposures to depleted uranium, and be able to adjust its programs accordingly.

Transparency is also an important issue that deserves attention. The politicization of the DU Program has significantly reduced the timely dissemination of accurate information about the health of veterans in the DU Program, and the applicability of this information to the larger Gulf War veterans' community. The new evaluation and monitoring project should provide full and timely disclosure of its findings. This will greatly reduce the potential for the Department of Defense to misrepresent the health status of veterans exposed to depleted uranium, it will eliminate the appearance that the VA is being less than honest about its own findings, and it will ensure veterans' support for the program.

CONCLUSION

This paper advocates transforming the DU Program to better utilize the VA's money and staff, and to improve the collection of information about the possible health effects of depleted uranium exposure. The mission of an evaluation and monitoring project would essentially mirror that of the current program: to monitor the health of veterans exposed to depleted uranium, and to create data useful to federal investigations of depleted uranium and Gulf War veterans' illnesses.

While the current DU Program relies on clinical evaluations of a small number of veterans, the improved project could use health questionnaires to monitor the health of a larger group of exposed veterans, and utilize clinical evaluations as needed to evaluate veterans who develop health problems possibly related to depleted uranium exposure. In this way, a greater number of veterans can be monitored, and the Department of Veterans Affairs will be able to create a more comprehensive body of knowledge about the health effects, if any, of Gulf War veterans' exposure to depleted uranium. A more detailed budget and programmatic design analysis is now needed to create a program that provides timely and useful information about depleted uranium to veterans and their families, VA physicians, and federal investigations.

In addition, the VA should take quick and forceful measures to de-politicize the DU Program and ensure that the findings of health examinations of veterans are accurately disclosed in a timely manner without sacrificing veterans' privacy.

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