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July 30, 2004

To Drs. Mclaughlin and Huber -

I am writing this letter to request that EPA and NRC amend their current Memorandum of Understanding or create a new MOU with regard to uranium and other radioactive elements that have toxicological as well as radiological bioactive properties. I am a technical support scientist for the Jefferson Proving Ground (JPG; Madison, IN) Restoration Advisory Board (RAB) and for Save the Valley, an NGO that is active in southeastern Indiana. In the past few years the Army has begun to address issues related to decommissioning or license termination for the JPG depleted uranium area. During this time, we (the citizens) have been repeatedly frustrated by the apparent lack of willingness by EPA representatives or by state agencies to provide oversight over depleted uranium contamination based on the non-radiological properties of the metal. The general consensus has been that NRC has regulatory oversight over all radiological materials, based on MOUs and (in Indiana) on state regulations. However, NRC (and specifically Dr. Mclaughlin) has repeatedly asserted that NRC regulations only address radiological properties of elements, not the non-radiological, toxicological effects. Thus, I am writing this letter to encourage your two agencies to produce an MOU to clarify the regulatory oversight situation. This will help us insist upon more complete guidance and oversight from our EPA and state agency representatives.

Depleted uranium, as a heavy metal, has both radiological and non-radiological properties that can cause adverse health effects. In this note, I will focus only on the non-radiological properties and effects, as they are the reason for the need for a clarifying MOU. As a heavy metal, depleted uranium will never stop being a heavy metal, and will therefore never stop being of toxicological concern. It can change oxidation state, and can change form (become soluble or insoluble, for example); indeed, it can decay to a different element. DU can also migrate into different environmental media, which can affect how it is taken up by the biota, including

humans. Once in the body the uranium can again change oxidation state, interact and combine with other elements, and could even [potentially] become organified, all of which will affect where and how the uranium interacts in the body. As a heavy metal, DU can be stored short term or long term in many organs, including bone, the nervous system, the liver; and DU, like virtually all heavy metals, will accumulate over time in the kidneys. Until recently, most exposures and therefore most information about the health effects of the radiological metals was based on high dose exposure to the more highly radioactive forms. Thus, high dose radiation effects tend to dominate the older literature. However, the production, testing and use of depleted uranium both in this country and on the battlefield abroad has led to situations in which civilian exposure can be expected to be chronic and relatively low dose, both radiologically and toxicologically. As uranium is a heavy metal, then we can expect the same potential range of effects induced by low dose, chronic exposure to virtually all non-essential metals. In general, the most sensitive endpoints for low dose, chronic heavy metal exposure are: nervous system and immune system dysfunction, reproductive and other endocrine dysfunction and anomalies, and kidney malfunction and damage, pretty much in that order. By far the most sensitive life stage is pre- and peri-natal, with the nervous system being the absolutely most critically sensitive organ system in terms of low dose sensitivity, severity of impact and long term or irreversible damage. When a civilian population is the target population, it is the developmental heavy metal-related effects that are of absolutely the greatest concern.

At this time, there is relatively little regulatory guidance for DU with regard to the non-radiological properties. The little guidance that does exist (the relatively recent EPA drinking water guidance for radionuclides) focuses primarily on the relatively less sensitive kidney endpoints in mature animals. We believe that once the EPA and NRC have clearly declared that EPA and the state agencies have oversight over all non-radiological aspects of environmental depleted uranium, more effort will be made to develop guidance to address what is now becoming a more common situation: chronic, low dose civilian exposure to DU and other less radiologically potent radioactive heavy metals. A new or revised MOU between EPA and NRC will thus help all affected citizens' groups, will help clarify the regulatory oversight situation, and may help the EPA and state agencies realize that they must develop more extensive guidance for DU (and other radionuclides) based on their heavy metal-based toxicological potential.

Thank you very much for considering this proposal.

Sincerely,

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