From: Michael Reimer
To: Snyder, Amy; Koenick, Stephen
Cc: Michael Reimer
Subject: [External_Sender] commentary on DU quantity
Date: Friday, November 10, 2017 12:08:54 PM

Michael Reimer
GeoMike5@att.net
November 10, 2017
RE: SUC 1593

Ms Amy Snyder, Senior Project Manager
Materials Decommissioning Branch (MDB)
Division of Decommissioning, Uranium Recovery, and Waste Programs (DUWP)
Office of Nuclear Material Safety and Safeguards (NMSS)
U.S. Nuclear Regulatory Commission (NRC)
Washington, D.C. 20555

Dear Ms Snyder,

I noticed a submission to the Adams library (ML17240A219) where Dr. Robert Cherry provided some additional information to you on the use of DU at Pohakuloa Training Area (PTA) when dummy projectiles (M390) of the Davy Crockett system were used in Hawaii and ended by requesting of me if I had additional information showing they contained DU, he would like me to provide it.

Given the high probability that this information is still classified, it is hardly a reasonable request of me, but I am sure you can obtain it.

It was not and is not my intention for my petition to turn into a confrontational issue. Rather it should initiate cooperation. My thesis is that more DU is present at PTA than provided for in the license SUC-1593 and is to make sure the license is consistent with the probable quantity and to suggest that air monitoring is the proper method for sampling to determine if DU is migrating off the property.

I presume that all parties, including the U.S. Army, NRC, and the public are interested in making sure the best factual information available is used in making decisions about dealing with DU presence at PTA. Am I correct in that presumption or am I being naive? Is it wrong to seek total transparency in this issue?

We have the factual information in the form of photographs that components of the M390 are at PTA and that they have a yellow coating. I appreciate the information Dr. Cherry provided. The information he provided indicated that these rounds were sometimes used in place of spotting rounds because the upgraded 37mm spotting rounds were not yet available. He also confirms that the M390 was used at PTA and provides some information on the specifications of the M390 that he says now can be released to the public.

While being very helpful in some areas, unfortunately, the information provided still does not definitively answer the question of whether or not the dummy rounds contained DU. The information says the M390 warhead contains a ball of malleable iron about 9 inches in diameter. Malleable iron can contain a few percentages of some graphite, silicon and then other trace elements and has a density of about 7.1 g/cm3 compared to iron at about 7.9 gm/cm3. As there is no information to the contrary, figuring the ball to be spherical, a sphere that size of malleable iron would weigh about 97 pounds. Add to it the 16 pounds of high explosive and other components and the weight greatly exceeds the total of the main fission warhead (M388) at 76 pounds including the W54 fission warhead weighing about 51 pounds of the total. It seems to be contrary to the exact ballistic match sought and trajectory mimicking, the goal

requiring DU in the spotting rounds, could hardly be achieved. Perhaps there is some missing information still classified that is unavailable to Dr. Cherry and that does not allow this major conundrum to be resolved.

Then there is the issue of the yellow coating on the M390 components as revealed in the photographs. It is consistent with uranium oxide U3O8. As you know, the first oxide to form on uranium is UO2 at ambient conditions, a dark brown to black color. The oxide phase represented by a yellow color is an ultimate phase progression from UO2 but can be formed at higher temperatures that could be produced by an explosion or from the pyrophoric nature of uranium. Its chemical composition can easily be determined because an earlier report by the U.S. Army contractor, Cabrera, stated that when various Davy Crockett system components were found, they were either removed and stored someplace or buried and the locations marked. It would therefore be simple to recover the component and analyze this coating. Unexploded ordinance should not be a problem in recovery as the areas where the components were found were previously accessible and the parts may very well be stored in a secured area at PTA.

Even if the M390 did not contain DU, we know that the 20 mm spotting round that was used for various calculations of the amount of DU present at PTA was replaced by the 37 mm spotting round and as we have no specific information available, we can only estimate that it contained more DU than the smaller 20 mm round. That would qualitatively mean that more DU is present than from the 20 mm rounds alone.

I feel it would be prudent in the meantime to err on the side of caution and make the presumption that there is more DU present at PTA than that listed on the single invoice found showing 714, 20mm spotting rounds. It seems so and must be considered.

Please share this with the PRB members.

Sincerely,

Michael Reimer, Ph.D.
Retired geologist
GeoMike5@att.net
11/10/2017