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From: [Luis Szyfres, MD, MPH](#)

Date: 09/19/07 20:50:45

To: [UOG/CNAS=Yudin.Lee, DEAN](#)

Cc: [AMI=Denton.Gary](#)

Subject: =From: Luis Szyfres, M.D., M.P.H. =To: Dr.Yudin @=RE: MEMO REGARDING TOXIC CHEMICALS IN THE DRINKING WATER OF GUAM=@



UNIVERSITY OF GUAM

MEMORANDUM

To: Dr. Lee Yudin
From: Luis Szyfres, MD, MPH
Re: Contamination of drinking water in Guam
Date: September 19, 2007

In reference to the copy of the paper from Vuki M, et al, that you gave me today, regarding that their study found arsenic concentrations in Tumon's spring waters below the values reported by GEPA, my opinion is:

1. *I agree with the authors in that: "An air force base (Andersen AFB), located in northern Guam in the Southwest Pacific was established during World War II, has provided 50 years of military support service..Base activities have resulted in numerous fuel, pesticide, and chemical spills over part of Guam's aquifer in the Groundwater Protection Zone...Soil monitoring data revealed very high concentrations of elements such as lead, arsenic, chromium, and cadmiu..however, there is limited information on the distribution of As in the groundwater of Guam"*
2. *I agree with Vuki's statement (Water Resources Research Grant Proposal. Title: Speciation studies of arsenic in Guam Waters Phase II): "Guam's main water source is from the limestone aquifer that lies in the northern half of the island. An estimated 80% of the total water source is derived from the aquifer ... There are more than 100 wells that serve the population and most of these are located on the northern part of the island".*
3. *I agree with the authors in that: "estimated exposure doses..is above the ATSDR's chronic oral MRI". The fact that it has been well documented that many members of the population of Guam have high blood levels of arsenic, i.e. blood testing at the Guam Medical Center, eliminates any possible doubt about the presence and exposure of the population of Guam to Arsenic.*
4. I think that the discrepancy in the arsenic concentrations in groundwater obtained by UOG and GEPA, should be clarified between the two institutions. In the meantime, it may prove to be useful

to start testing the contamination of Guam’s Drinking Water for the Toxic Chemicals that we know that are present in the groundwater of the area of Guam that provides 80% of Guam’s water.....

CONTAMINATION OF DRINKING WATER IN THE NORTHERN PART OF GUAM, ANDERSEN AFB, YIGO:

ATSDR report based in the following sources:

- a) United States Air Force (USAF):1992a, 1996, 1997, 2000.
- b) Andersen Air Force Base. Yigo, Guam: 1998b, 1998c, 1998d;
- c) SAIC [leading provider of scientific, engineering, systems integration and technical services and solutions to all branches of the U.S. military, agencies of the U.S. Department of Defense (DoD), the intelligence community, the U.S. Department of Homeland Security (DHS)], 1991
- d) Andersen Air Force. Yigo, Guam. 1999c, 1999d, 1999e, 1999f, 1999g;
- e) Anderson Air Force Base. Yigo, Guam. EPA ID #: GU-6571999519. OU 07. December 2003.
- f) Anderson Air force Base, Yigo, Guam. 2000b, 2000c.

***Groundwater** results are for monitoring and production wells located immediately downgradient of each site.

Site	Site Description/Waste Disposal History	Investigation Results/ Environmental Monitoring Results*
Site No. 1 Landfill No. 1 (LF-1) (Operable Unit (OU): Main Base)	LF-1 opened in 1945 and continues to be used today as the base's only active landfill. Materials disposed of include sanitary trash, waste petroleum, oil, and lubricants (POL), solvents, ferrous metal, construction debris, and pesticides.	<p style="text-align: center;">Groundwater:</p> Lead was detected above Agency for Toxic Substances and Disease Registry (ATSDR) Drinking Water comparison values (CVs).
Site No. 2 Landfill No. 2 (LF-2) Landfill No. 4 (LF-4) Landfill No. 5 (LF-5) (OU: Main Base)	LF-4 and LF-5 are contained within LF-2. LF-2 was used from 1947 to 1975, with a small area remaining active until 1982. Materials disposed of at this site include sanitary trash, waste POL, solvents, pesticides, ferrous metal, construction debris, and unexploded ordinance (UXO).	<p style="text-align: center;">Groundwater:</p> TCE was detected above the ATSDR Drinking Water CVs.
Site No. 8 Landfill No. 10 (LF-10)	LF-10 operated from the early to mid-1950s. Materials disposed of included asphalt wastes, scrap	<p style="text-align: center;">Groundwater:</p>

<p>Landfill No. 11 (LF-11) Landfill No. 12 (LF-12)</p> <p>(OU: Main Base)</p>	<p>metals, empty 55-gallon drums, sanitary wastes, construction debris, occasional waste POL, and solvents.</p> <p>LF-11 was used in the early 1950s as a disposal area for asphaltic material, empty 55-gallon drums, and construction debris.</p> <p>LF-12 was used in the late 1950s to dispose of sanitary trash and small quantities of asphaltic wastes.</p>	<p>TCE, PCE, lead, and other organics were detected. PCE concentrations exceeded the ATSDR Drinking Water CVs.</p>
<p>Site No. 20</p> <p>Waste Pile No. 7 (WP-7) (formerly known as Landfill No. 25)</p> <p>(OU: MARBO Annex)</p>	<p>WP-7 was in use from 1945 to 1962. It contains sanitary trash, waste POL, solvents, scrap vehicles, and equipment, construction debris, and waste dry cleaning fluids.</p>	<p>Groundwater:</p> <p>TCE was detected above the ATSDR Drinking Water CVs.</p>
<p>Site No. 22</p> <p>Waste Pile No. 6 (WP-6) (formerly known as Landfill No. 27)</p> <p>(OU: MARBO Annex)</p>	<p>WP-6 contains construction debris. Dates of operation are unknown.</p>	<p>Groundwater:</p> <p>PCE was detected above its respective ATSDR Drinking Water CV.</p>
<p>Site No. 26</p> <p>Fire Training Area No. 2 (FTA-2)</p> <p>(OU: Main Base)</p>	<p>Between 1958 and 1988, contaminated JP-4, Mogas, diesel, waste POL, and solvents were spilled at FTA-2.</p>	<p>Groundwater:</p> <p>TCE and PCE were detected. BTEX (benzene, toluene, ethylbenzene, and xylene) were present at concentrations up to 7,200 ppb at levels above CVs for Drinking Water.</p>
<p>Site No. 30</p> <p>Waste Pile No. 4 (WP-4) (formerly known as Chemical Storage Area 3)</p> <p>(OU: Northwest Field)</p>	<p>From 1950 to 1970, UXO was disposed in WP-4. In addition, the site was reportedly used for the disposal of waste oils and solvents.</p>	<p>Groundwater:</p> <p>Groundwater collected from downgradient monitoring wells contained VOCs and metals. Chromium and nickel possibly related to corrosion of the steel pump and screens in wells exceeded EPA's MCLs..</p>
<p>Site No. 33</p> <p>Drum Storage Area No. 2 (DS-2)</p> <p>(OU: Main Base)</p>	<p>DS-2 is an active drum storage area for asphalt, paint, oil, tar, and contaminated soil from underground storage tank (UST) removals. It is about 4,000 feet from the nearest housing and is</p>	<p>Groundwater</p> <p>PCE concentrations slightly exceeded the ATSDR drinking water CV.</p>

<p>Site No. 37 War Dog Borrow Pit (WDBP) (OU: MARBO Annex)</p>	<p>fenced. No evidence exists that the area was used for storage of hazardous substances before 1984. WDBP is an abandoned quarry. Its dates of operation and contents are unknown.</p>	<p>Groundwater: TCE was detected above the ATSDR drinking water CV.</p>
<p>Site No. 38 MARBO Laundry Facility (MLF) (OU: MARBO Annex)</p>	<p>The MARBO Laundry Facility is a former laundry facility.</p>	<p>Groundwater: PCE was detected above the ATSDR drinking water CV.</p>

Sincerely yours,

Luis Szyfres, M.D., M.P.H.