SMILOW CANCER HOSPITAL
AT YALE-NEW HAVEN

May 17, 2012

Eileen Kostic
United States Department of Veterans Affairs
Regional Office & Insurance Center
5000 Wissahickon Avenue
P.O. Box 8079
Philadelphia, PA 19101

Re: VA File Number [redacted] – Venter, Josiah B.

Dear Ms. Kostic,

I am a Professor of Medicine (Hematology) at Yale University School of Medicine and the Smilow Cancer Hospital at Yale-New Haven Hospital. I have reviewed the pertinent records in Josiah Venter's VA claims file and I personally treated Mr. Venter at Yale-New Haven Hospital for his Myelodysplastic Syndrome (MDS) and Acute Myeloid Leukemia (AML). Mr. Venter came to me with MDS but his condition rapidly progressed to AML.

My comments below are based on my physical examination of Mr. Venter, Mr. Venter's medical history as he recounted it to me and as contained in his medical records, and the results of objective medical tests including blood work, chromosomal analysis, and bone marrow aspirations/ biopsies.

I first recognized Mr. Venter had hematologic abnormalities with progressive cytopenias in July of 2011. Three separate bone marrow examinations were performed revealing a progressive increase in the number of immature cells within the marrow with chromosomal abnormalities revealing 9q-trisomy and 21 q-tetrasomy in 40% to 50% of the bone marrow cells. I initially administered decitabine in an attempt at differentiation therapy of his complicated hematologic disorder.Mr. Venter's course was complicated by cardiopulmonary complications including pericarditis, pleuritis, and congestive heart failure. I treated him with blood product support for his cytopenias and he subsequently required ventilator support for hypoxemia.

Mr. Venter's hospital course was one of progressive deterioration with a capillary leak syndrome resulting in third-spacing of fluids in the lungs, abdomen, and extremities. Mr. Venter developed progressive hypoxemia and hypotension and died in the Medical Intensive Care Unit on October 2, 2011. He was day 14 post-administration of decitabine for treatment of his myelodysplastic/myeleukemic process. Mr. Venter was 65 years old when he died. He did not have any significant pre-existing risk factors for MDS or AML and did not smoke.

When I treated Mr. Venter, I observed complex chromosomal abnormalities in his bone marrow. These kinds of abnormalities when present in MDS often result from exposure to some toxin, drug, or radiation therapy. Mr. Venter informed me that he had been exposed to and inhaled Agent Orange fog on multiple occasions while he served in the Navy in Vietnam. I conclude that Mr. Venter's MDS/AML was more likely than not caused by his extensive exposure to Agent Orange.

In the relevant medical literature, benzene exposure is an accepted precursor of MDS and complex acute leukemia like AML. *See, e.g.*, Institute of Medicine of the National Academies, 2 GULF WAR AND HEALTH: INSECTICIDES AND SOLVENTS (2003); H. Van den Berghe et al., *Chromosome*

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Analysis in Two Unusual Malignant Blood Disorders Presumably Induced by Benzene, 53 BLOOD 558 (1979); Song-Nian Yin et al., *An Expanded Cohort Study of Cancer Among Benzene-exposed Workers in China*, 104 ENVIRONMENTAL HEALTH PERSPECTIVES 1339 (Supp. 6 1996). I have reviewed the Institute of Medicine of the National Academies most recent study *Veterans and Agent Orange: Update 2010* finding the link between AML and Agent Orange inconclusive (p. 396). However, this study suggests that AML is associated with exposure to benzene (p. 395). It is my professional opinion that benzene exposure is linked to MDS/AML.

Benzene is a chemical element of Agent Orange. There is evidence Agent Orange was contaminated by a compound called 2,3,7,8-tetrachlorodibenzo-p-dioxin ("dioxin"), resulting from inconsistent temperature regulation during the manufacturing process. The "dibenzo" part of this chemical name refers to the two benzene rings present in chemical structure of dioxin. *See, e.g.*, ALVIN E. YOUNG, THE HISTORY, USE, DISPOSITION AND ENVIRONMENTAL FATE OF AGENT ORANGE 161-90; Ronald A. Hites, *Dioxins: An Overview and History*, 45 ENVIRONMENTAL SCIENCE AND TECHNOLOGY 16-20 (2011); Arnold Schecter et al., *Dioxins: An Overview*, 101 ENVIRONMENTAL RESEARCH 419-28 (2006). There is precedent for finding a connection between exposure to the benzene rings in dioxin and MDS and AML. *See e.g.*, Board of Veterans Appeals Citation Nr. 0812788, Dkt. No. 03-11 902A (Apr. 17, 2008).

It is my professional opinion that it is more likely than not that Mr. Venter's repeated exposure to Agent Orange fog during his service in Vietnam was the primary cause of his MDS/AML, which led to his death. Mr. Venter had no significant exposure to benzene other than from his exposure to Agent Orange during his service. I say this recognizing that some people also exposed to Agent Orange do not develop MDS/AML and notwithstanding any contrary conclusions by VA in Josiah Venter's VA claims file.

Enclosed you will also find my Curriculum Vitae. Please do not hesitate to contact me if you have any questions.

Sincerely,

Dr. Thomas Patrick Duffy

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Encl.