

OFFICE OF THE SECRETARY
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RIV
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JACKSON, OEDO

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AFFILIATION: CA

ADDRESSEE: Dr. Bob England (Maricopa County, CA)

SUBJECT: Concerns regarding tritium in Phoenix and the people of Phoenix

ACTION: Information

DISTRIBUTION: RF, SECY to Ack.

LETTER DATE: 01/21/2013

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DATE DUE:

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Jan 21, 2013

Director, Maricopa County Dept. of Public Health
4041 N. Central Ave.
Phoenix, Az. 85102

Subject: Tritium in Phoenix & People of Phoenix

Dear Dr. Bob England, MD

Tritium has caused leukemia and congenital aberrations which resulted in the 2000 closing of an AMERSHAM PLANT in Cardiff, Wales (Ref: Figure 3, "Hidden Tritium". Down's syndrome was found to increase by 80% in Pickering and 46% in Ajax because of tritium releases from the Pickering Nuclear Station in Canada between 1978 and 1985. The US Dept. of Labor, in 2008, paid a one billion dollar settlement to former nuclear workers of the Neutron Devices Plant located near Pinellas Park, Fla. More workers at the Dept. of Energy Savannah River Site died from pleural cancer and leukemia than would be expected in the general population. The higher the radiation dose of tritium, the higher chance of fatal leukemia (Ref: Center for Disease Control and Prevention).

Damage by tritium to humans occurs by the inhalation and/or dermal adsorption of tritium oxide: when the environmental and exposure medium are the same, the intake for both inhalation and dermal intake is the same. Gaseous tritium is exhaled by humans without effective absorption (Ref: lbl.gov/ehs/esg/tritium). Within one to two hours after intake, tritium will be evenly distributed throughout the body's fluids (Ref: Physics Dept., Idaho State Univ.) which includes those of a fetus, if present.

From 1985 through 2010, the Arizona Radiation Regulatory Agency (ARRA), in conjunction with the EPA, monitored Phoenix's precipitation for tritium. The collection occurred at ARRA's facilities at 4814 South 40th St., Phoenix, Az. 85040. The results were published by the EPA in its Envirofacts Database. No results were known to be published by ARRA.

The NRC Radioactive Effluent and Environmental Reports for Palo Verde Units 1,2, and 3 in 2011 cite total tritium emissions of 2,024 curies released as gaseous effluent in Maricopa County. A release of 3,000 curies of tritium annually was considered acceptable.

Looking at a map of Maricopa County, the gaseous tritium is released to ground level at variable times where the westerly winds, prevailing eleven months of each year, carry the tritium gas plume eastward. As the plume expands to the north and south, tritium gas converts to tritium oxide (water) with lesser concentrations as the distance from the tritium source increases.

A singular monitoring site, such as ARRA's Phoenix, collects tritium in precipitation at one spot in the tritium plume. The precipitation, depositing tritium at ARRA's Phoenix, is also depositing tritium in a multitude of, possibly continuous, spots within the entire zip code 85040 and others elsewhere.

In 2005, ARRA started monitoring at its Phoenix/956, west of its Phoenix site by approximately thirteen miles. Comparison of identical radioactive isotope measurements, from both sites, revealed that the Phoenix site concentration results were 82.5 % of those measured at the Phoenix/956 site.

The average incident of Down syndrome in Arizona between 1995 and 2007 was 12.87. The

Incident rate of Down syndrome from 1995 to 2007 fluctuated among native Indians who had an average rate of 14.32 13.33 for African Americans. The average for white and Hispanic were relatively constant with 11.9 and 13.67, respectively. However, peaks in 1998 27 for native Americans (Fig.2), 14 for white, non Hispanic (Fig 4) and 25 for African Americans (Fig 3)(Ref: Birth Defects Monitoring Program, Facts about Down Syndrome,1995-2007). The Down syndrome Incident Rate from 1995-2007 dropped from 12 to 10 with increase from 12.5 in 1997 to 16 in 1998.

During this period, there were also peaks in the tritium concentration being deposited upon Phoenix. The concentration for 1997 was 2845.2 pCi/L, 414 0.8 pCi/L for 1998, 5065.2 pCi/L for 1999, and 7957.8 pCi/L for 2000.

A community Approach to address fetal and infant death in Maricopa County which included Maryville and South Phoenix was assessed in 2004 from a community approach by the Maricopa County department of Public Health. This evaluation shall only include fetal mortality (a fetal death is anytime during pregnancy) and the environmental presence of radioactive tritium. The South Phoenix Neighborhood was defined by zip codes,85003,85004,85007,85009,850343,85041,85042,85043, 85339, and85040 which includes ARRA's Phoenix monitoring station for collecting precipitation containing tritium. This area is contained in a rectangle bordered by I10, 40th St., Dobblas Road, and 91st Ave.

South Phoenix during 1996-2000 had an F-IMR (Fetus-Infant Mortality Rate) of 10.6 deaths which was higher than the country's. In1996-2000, the reference group consisted of Maricopa County non Hispanic white women, at least 20 years of age, who had a total F-IMR of 5.8 deaths per 1000 live births and fetal deaths. Subtracting the reference groups F-IMR (5.8) from the South Phoenix F-IMR (10.6) yields an excess mortality rate of 4.8 which suggests 45% of the deaths were potentially preventable.

If the South Phoenix F-IMR were similar to the reference groups F-IMR, there would have been 111 fewer fetal deaths. Of the 111 excess fetal deaths, 41 occurrences were in "maternal health" and 32 in the "maternal care" category of which both categories are subject to tritium fetus damage. These deaths occurred during the Phoenix environmental tritium spikes of 1997, 1998, and 1999.

Maryville was defined by five zip codes; 85017, 85019, 85031, 85033, and 85035 which border those of South Phoenix on the west. ARRA monitoring site Phoenix/956 is a thirteen miles west and slightly north east of the Phoenix site and also slightly above the eastern zip code of Maryville. Previous results in which Phoenix site was 82.5% of Phoenix/956 gives tritium peaks of 3448.7 pCi/L for1997,5019.2 pCi/L for1998,6132 pCi/L for1999, and 9645.8 pCi/l for 2000.

Maryville's overall F-IMR during 1996-2000 was similar to the whole country's F-IMR of 8.8 deaths per 1000 live births, and fetal deaths. Within Maryville, F-IMR differed between subgroups. During 1996-2000, the F-IMR was 8.8 deaths and the excess was 3 deaths. In Maricopa County, 32% of the current fetal infant mortality is potentially preventable; the proportion is 34% for Maryville ad 45% for South Phoenix.

Fetus eggs can be exposed to tritium's radiation for decades after initial exposure (Ref: Review of Risks from Tritium, UK, Nov 2007). Radioactive isotopes incorporated within a

woman's body pose an in-utero risk 4-5 times greater than air external exposure would pose to her developing fetus(Ref: Environmental Health, Vol 8.43,2009

Tritium covers Phoenix in varying concentrations depending on distances from the source. Tritium entering a woman's body rapidly spreads to all locations including a fetus, if present. Tritium radioactivity can damage, or destroy a fetus and/or cause other physical damage including cancer. The amount of tritium in Phoenix shall increase with time under current release criteria. Monitoring tritium is essential for the future health of its population. The only method for controlling tritium is containment. From the EPA Tritium radiation measured in Phoenix and the findings of Dept. of Public Health for cases of Down's Syndrome and fetus deaths in conjunction with tritium radiation peaks in Phoenix, the conclusion necessitates the containment of tritium being blanketed on Phoenix.

For the children and people of Phoenix


Clyde H. Stagner

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CC:President,USA

Professor Nadesan

Director, Az. Dept of Health Services

Director, ARRA

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Chairman, NRC

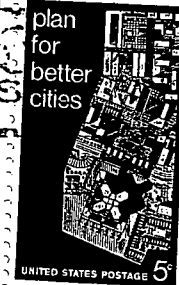
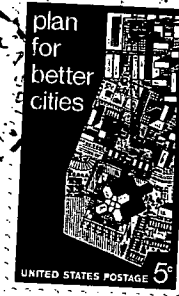
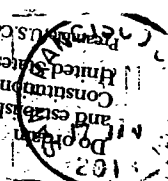
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