



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

April 1, 1994

The Honorable John F. Kerry  
United States Senator  
One Bowdoin Square, Tenth Floor  
Boston, Massachusetts 02114

Dear Senator Kerry:

In your letter of March 2, 1994, you asked for a response to the issues raised in a letter from your constituent Rachele A. Natale. Her concerns arose from a public meeting she attended on the Watertown Arsenal. At this meeting, representatives of the Agency for Toxic Substances and Disease Registry (ATSDR) of the Public Health Service and the Massachusetts Department of Environmental Protection made presentations on a health assessment study being conducted in the vicinity of the arsenal site. This site has been used, and a part of the site continues to be used, by the U.S. Army, for typical military industrial research and development programs, including the use of radioactive materials. It should be noted, however, that the Materials Technology Laboratory, located on the site, is scheduled to close by September 1995, in accordance with the Base Closure and Realignment Act.

Our responses to the nine specific questions raised by Rachele Natale are provided below, followed by a comment on her impressions of the relative health hazards posed by nuclear as opposed to chemical wastes.

(1) What nuclear materials were present at the Watertown Arsenal?

The principal radioactive material used at the Watertown Arsenal was depleted uranium. Depleted uranium is uranium in which the natural concentration of the fissionable isotope uranium-235 has been reduced. The arsenal conducted research into uses of the depleted uranium, mainly in the production of armor-piercing projectiles and other military weapons components. Nearly all the radioactive waste and other materials that the Army and its contractors are removing during the remediation of the former arsenal are contaminated with depleted uranium. Some natural uranium and smaller quantities of a variety of other radionuclides were also used for research and development and instrument calibration purposes. These nuclides included tritium (hydrogen-3) and various gamma-emitting nuclides that are typically contained in sealed capsules that prevent any spread of contamination. The remediation efforts at the arsenal are nearly complete, and all radioactive contamination will be removed to achieve acceptable remediation levels.

(2) When were the materials first present?

Arsenal work involving radioactive materials began in the early 1940s and was conducted at various locations within the then Watertown Arsenal. This early activity was conducted under the auspices of the Manhattan Engineering District and the U.S. Atomic Energy Commission. Activities included a research program on African ore (containing

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uranium) conducted by the Massachusetts Institute of Technology for the Manhattan Engineering District, and work with depleted uranium conducted by the U.S. Army (this work required the support of a machine shop, foundry, and uranium processing that were located in several buildings). Within the area currently occupied by the Materials Technology Laboratory, a number of facilities were, and continue to be, used for work involving depleted uranium and other radioactive materials (including licensed activities involving uranium and thorium that began about 1958). In 1960, a research reactor was constructed for use in neutron radiography (see response to next question). More specific information concerning activities at the site is contained in documents associated with the remediation of the former arsenal that have been provided and are available at the Watertown Main Library, Reference Department.

- (3) What nuclear reactors were built before or after the one in Watertown?

There has been only one reactor at the U.S. Army Materials Technology Laboratory (MTL) site in Watertown. The reactor was operated from June 1960 until March 1970, at power levels up to 5 megawatts. The reactor was used to conduct various materials studies and neutron activation analyses. The reactor was a material testing reactor (MTR) design, a common research reactor type found at many universities throughout the United States. All reactor fuel was removed from the site in 1970. The reactor facility was idle from 1970 to 1990, when studies were done to prepare for decommissioning. In October of 1991, the MTL submitted a plan to the U.S. Nuclear Regulatory Commission to decommission the facility. NRC approved the plan in May 1992. Decommissioning activities were completed in January 1993. All that was left of the original facility at the end of decommissioning activities was the empty reactor building. The Oak Ridge Institute for Science and Education performed an independent survey of the reactor building and reactor site for NRC in April 1993. The survey confirmed that the reactor building and site met NRC guidelines for release for unrestricted use. The reactor license was terminated by NRC on October 5, 1993. The MTL is in the process of removing the former reactor building shell. All that remains at this time is the basement floor. The reactor site will be returned to a grass field after the demolition process is complete.

- (4) How are they [the nuclear reactors] different?

Because there has been only one reactor at the MTL, there are no contrasts to be made. However, as indicated above, the design is typical of 46 research reactors in operation in the United States.

- (5) Are there other studies completed or ongoing by other or independent groups?

In attempting to respond to this question, we contacted both the ATSDR and the Massachusetts Department of Environmental Protection. Based on

these contacts, no other health assessment studies of the Watertown area applicable to Rachele Natale's concerns were identified.

- (6) Can nuclear contamination effect [affect] progeny of the exposed?

Ionizing radiation, including the natural background we are all subjected to in our daily lives, can damage the genetic material in reproductive cells and result in mutations that are transmitted from generation to generation. Such effects are of main concern in relation to potential exposures to extremely large sources of radiation, not representative of the Watertown site. Expert groups such as the National Academy of Sciences-National Research Council's Committee on the Biological Effects of Ionizing Radiation (BEIR) have provided "best estimates" of this risk, and have concluded that limiting exposures to radiation to reduce the risk of cancer also limits the genetically significant exposure. These groups have also concluded that, in regard to the induction of mutations, the greater current risk appears to result from exposure to chemical mutagens in the environment.

- (7) What means are being used to inform those who have moved away of the [ATSDR] study?

The ATSDR has indicated that in performing a "health assessment," information is not specifically sought from individuals who have left the assessment area. If the ATSDR decides to conduct a followup "study," such individuals would be sought out for information.

- (8) Are there reasonable precautions that those living in the area can take in case there is any problem that still exists?

As indicated in response to the first question, remediation efforts at the arsenal are nearly complete. Any residual radioactivity must comply with NRC criteria before the site can be released for public use. Compliance will be demonstrated not only by NRC review of a final survey that must be conducted by the Army, but also by an NRC confirmatory survey. Once a site has been decommissioned and the license terminated, NRC could require additional cleanup if, based on new information, it is determined that the residual radioactivity remaining on the site could result in significant public or environmental harm.

- (9) How can I help you work for a complete and efficient study and, if the results of the study show that the community and/or individuals were negatively effected [affected], what help will be available and how will it be provided?

At this point, it would appear that Rachele Natale can best help efforts to produce a complete and efficient [study] assessment by providing appropriate responses to the ATSDR. Until the assessment is completed and conclusions are reached, we cannot meaningfully comment on what, if any, help should be made available or whether it can be provided.

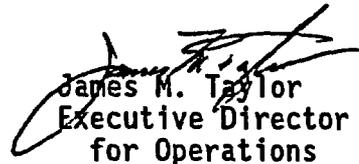
The Honorable John F. Kerry

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In concluding her letter, Rachele Natale expresses her thoughts on the relative significance of nuclear as opposed to chemical wastes. As alluded to in our response to Question 6, certain chemicals, like radiation, are known to be capable of producing carcinogenic and genetic effects. In general, the significance of any effect on human populations depends on the magnitude of the chemical or radiation exposure. We believe it is significant to point out that, unlike the case for these chemicals, we all live in an environment that naturally exposes us to known levels of radiation exposure. Thus, in establishing criteria for radiological remediations of contaminated sites, we not only can take into account the projected risks associated with any residual activity, but also can ensure that any projected exposures are small in magnitude, when compared to that which we naturally receive.

I trust that our reply responds to Rachele Natale's concerns.

Sincerely,

  
James M. Taylor  
Executive Director  
for Operations

cc: A. Malewicz, Mass. DEP  
L. Boseman, ATSDR

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Original signed by  
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