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January 23, 1997

Mr. Joseph Vozella, Chief  
Environment, Safety and Health Branch  
Los Alamos Area Office  
Department of Energy  
Los Alamos, New Mexico 87544

**RE: RISK-BASED CORRECTIVE ACTION PROCESS, RESPONSE (DATED JUNE 27, 1996) TO NMED/EPA COMMENTS, LOS ALAMOS NATIONAL LABORATORY**

Dear Mr. Vozella:

The New Mexico Environment Department (NMED) Hazardous and Radioactive Materials Bureau (HRMB) and the Environmental Protection Agency (EPA) have reviewed the Los Alamos National Laboratory (LANL) response, dated June 27, 1996, to the NMED/EPA comments on the Risk-Based Corrective Action Process document. The response adequately addressed all of the NMED/EPA concerns except one: LANL argued that it did not need to calculate carcinogenic risk due to radiation because it will clean up radiation against a dose standard of 10 milli-rem per year.

A **dose**, or a quantity of a dose of 10 milli-rem, can be interpreted several ways unless it is further qualified. There are several types of doses and these various definitions correspond to different carcinogenic and total risks due to radiation effects. If the dose corresponds to an instrumental radiation reading, this is an **exposure dose**. Should the dose take into consideration ingestion and inhalation, it could be classified as a **committed effective dose equivalent**. An **effective dose equivalent** is a total of the **committed effective dose equivalent** and the **external effective dose equivalent**. To make matters even more confusing, different institutions, such as EPA and the Department of Energy, may have different names for the same types of calculated doses. Furthermore, the International Commission on Radiological Protection which developed the original terminology for doses has changed the dose terminology as of 1991. It is not only an important requirement that the carcinogenic or total risk from radiation which corresponds to a dose be calculated, but that the dose or dose quantity be defined in very precise terms for a specific site, or in the Risk Based



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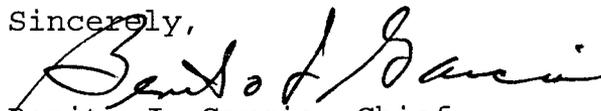
Corrective Process documentation.

In addition, it is appropriate to manage carcinogenic risk due to radioactivity by cleaning up radioactive material to a dose standard, it is also important to calculate carcinogenic or total risk due to radiation for risk management purposes. At an effective dose equivalent of 10 milli-rem/yr, total risk due to radiation which includes fatal cancers, non-fatal cancers, and severe hereditary effects over a period of 70 years approaches  $10^{-3}$ . NMED and EPA agree that this is extremely important information for a risk manager to use when making decisions on clean-up levels of RCRA regulated carcinogenic chemicals of concern. For example, if total radiological risk for a site is  $10^{-3}$ , then cleaning up RCRA regulated carcinogenic contaminants to levels between  $10^{-4}$  and  $10^{-6}$  will not decrease overall site risk. Alternatively, the total radiological risk may be in the range of  $10^{-6}$ , and a cleanup of RCRA contaminants to lower levels might be appropriate. Therefore, knowing total radiological risk is extremely important in making risk management decisions.

In order to be acceptable, the Risk-Based Corrective Action Process document must be modified according to NMED/EPA comments and the requirements described in the above paragraphs.

Should you have any questions concerning this letter, please contact Mr. Stu Dinwiddie or Ms. Susan Hoines of my staff at 505/827-1558.

Sincerely,



Benito J. Garcia, Chief  
Hazardous and Radioactive Materials Bureau

cc: David Neleigh, Chief, US EPA Region 6  
Stu Dinwiddie, Manager, RCRA Permits Management Program  
Theodore J. Taylor, Manager, DOE MS A316  
Jorg Jansen, Manager, LANL MS A316  
John Parker, Chief, NMED DOE OB  
Susan Hoines, RCRA Permits Management Program  
File HSWA LANL Gen/Misc.