SEP - 8 1995

License No. SMB-743
Docket No. 040-07102

C. Scott Eves
Radiation Safety Officer
Shieldalloy Metallurgical Corporation
West Boulevard
P.O. Box 768
Newfield, NJ 08344

Dear Mr. Eves:

This is in reference to your letters dated March 14, 1995 and May 15, 1995 which indicate that you plan to adjust the Derived Air Concentration (DAC) for airborne thorium and uranium activity at your facility. In your proposed adjusted DAC, you take into account the measured particle size distributions and thorium and uranium to gross alpha ratios. In order to continue our review, we need the following additional information:

1. You are authorized to possess thorium and uranium in any form. In your analyses and calculations, you assign the thorium and uranium aerosol in the workplace to inhalation Class Y. Please state what forms of these materials you use and justification for using Class Y. A clarification of this point is necessary because, for example, the DAC for Class W is 50% lower than that for Class Y, and appropriate adjustments must be made depending upon the form that is used.

2. You used isotopic ratios to calculate the thorium and uranium activity from the results of gross alpha counting. This value is the ratio of the concentration of thorium and uranium activity to the total activity of alpha emitters in materials used at your facility, and was determined by isotopic analysis. You did not provide assurances that this ratio will reflect the ratio of emissions from the various alpha emitters in an air sample. This latter ratio may differ from that obtained by isotopic analysis because of the inaccuracies in determining counting efficiency such as self-absorption, geometry, and detector efficiency. Please provide a justification for using this scaling method based upon evidence that this ratio will reflect the ratio of emissions in an air sample.

3. You stated in your discussion of the analysis of the sampling results that the Activity Median Aerodynamic Diameter (AMAD) was calculated by calculating the mean particle size for the distribution. The correct quantity, however, is the median size. Please clarify this point by providing details on the method they used to calculate the AMAD.

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4. In addition to our concerns regarding calculation of the AMAD, we also note that the Graseby/Anderson Model Mark III particle fractionating sampler that you used is susceptible to many errors that would result in nonrepresentative particle size distributions. These include changes in air flow rates, operating pressure, collection plate spacing, loss of sample due to movement of the sampler, calibration of the sampler, and other factors. The method is also subject to substantial errors due to particle bounce if proper precautions are not taken. The above concerns are heightened by the fact that data analysis was conducted offsite, thus involving transportation of the samples. Please describe the methods used to obtain the samples, the operating procedures for calibration and sampling, the precautions taken during transportation, the methods used to minimize particle bounce and their effects on alpha counting, and the qualifications of the person(s) who operated the sampler and shipped the samples for analysis. Error estimates for the activity determined for each stage should also be provided.

5. Please provide assurances that the air sampling data, particularly the particle size distribution data, is representative of the type of aerosols that workers are exposed to at each work location. Although some information was provided, it was insufficient to provide this assurance.

In order to approve an adjusted DAC, we must resolve the above concerns. Therefore, please submit your detailed discussions of how the above concerns were addressed.

We will continue our review upon receipt of this information. Please reply in duplicate to my attention at the Region I office. If you have any technical questions regarding this deficiency letter, please call Sheri A. Arredondo at (610) 337-5342.

Sincerely,

ORIGINAL SIGNED BY:
SHERYL VILLAR

for Mohamed M. Shanbaky, Chief
Research & Development Section
Nuclear Materials Safety Branch
Division of Radiation Safety
and Safeguards

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cc: State of New Jersey

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