



SHIELDALLOY METALLURGICAL CORPORATION

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January 14, 1997

Mr. Gary C. Comfort
Licensing Section 2
Division of Fuel Cycle Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Re: Source Material License No. SMB-743, TAC No. L30921

Dear Mr. Comfort:

Shieldalloy Metallurgical Corporation (SMC) is in receipt of your December 17, 1996 letter wherein additional information in regard to our bioassay testing program for employees was solicited. Attached is our response to your request.

SMC is looking forward to timely renewal of License No. SMB-743. Therefore, if I can answer any questions or assist you in expediting your review of the information contained herein, please call me at (609) 692-4200.

Sincerely,

C. Scott Eves
Radiation Safety Officer

cc: Carol Berger

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**ADDITIONAL INFORMATION TO SUPPORT
THE LICENSE RENEWAL APPLICATION FOR
SHIELDALLOY METALLURGICAL CORPORATION**

USNRC Comment 1: Please explain the extent to which breathing zone and area air sampling will be used in conjunction with direct bioassay to determine internal exposure. Will air sampling results be used to determine when special bioassay sampling may be necessary?

SMC Response: Breathing zone and area air sampling will not be used in conjunction with bioassay to determine internal exposures. Bioassay data will form the basis for the internal dose assessment. Only if bioassay data are unavailable will air sampling data be used to assess internal exposures. However, air sampling results will be used to evaluate workplace conditions during non-routine operations for the purpose of determining whether special bioassay sampling or modified sampling frequencies are required, and to provide confirmatory data for special projects that are not expected to result in intakes of radioactivity.

Action Taken: Section 5.7.4.1 of RSP-010, "Exposure Control" will be modified to read: "Air sampling may be used to assess internal exposure potential, determine the need for and frequency of bioassay sampling, and for assessment of internal exposures when bioassay data are unavailable."

USNRC Comment No. 2: In Attachment 5 of the September 4, 1996 submittal, it is explained that the minimum detectable activity (MDA) for the laser fluorometry detection system, 0.1 pCi per urine sample, can be reduced to 0.03 pCi by taking three, 24-hour samples. The MDA (minimum detectable activity, pCi) gives a measure of the sensitivity of the detection system. The MDC (minimum detectable concentration, pCi/l) is the MDA divided by the volume of the aliquot of the urine sample used in the laser fluorometry test. Therefore, the volume of the urine sample taken should not affect this calculation. Please provide the equation that is used to determine the MDA and justify the reduction in the MDA by three.

SMC Response: In Attachment 5 of RSP-010, "Exposure Control", a nominal detection sensitivity of the laser fluorometry system for ^{238}U was reported to be 0.1 pCi *per sample*. Since the entire collected sample and not an aliquot is digested and analyzed by this method, the nominal detection sensitivity of 0.1 pCi applies to the entire sample. However, since each sample is a composite of three simulated 24-hour collections of urine (see RSP010 "Exposure Control") from a single individual, it is reasonable to assume that a "negative" result from the system is a result of the individual excreting no more than an average of 0.03 pCi of ^{238}U *per 24-hour period*, as shown in the following:

$$0.1 \frac{\text{pCi}}{\text{sample}} \times \frac{1 \text{ sample}}{3 \text{ collections}} = 0.03 \frac{\text{pCi}}{\text{collection}}$$

Action Taken: For clarity, the wording in Attachment 5 of RSP-010 will be modified to read: "For ^{238}U , the detection sensitivity by the methodology of laser fluorometry is a nominal 0.1 pCi per sample, which meets the performance criterion contained in ANSI N13.30 of 0.14 pCi per day. If the entire sample is analyzed, and if the sample is comprised of three 24-hour collections of urine, the activity in urine, A_u , is taken to be $0.1 \div 3$, or 0.03 pCi per day."