



SHIELDALLOY METALLURGICAL CORPORATION

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January 13, 1992

Mr. Jerry Swift, Section Leader  
Advanced Fuel & Special Facilities Section  
Fuel Cycle Safety Branch  
Division of Industrial & Medical Nuclear Safety  
Office of Nuclear Material Safety & Safeguards  
United States Nuclear Regulatory Commission  
Washington, D.C. 20555

RE: Shieldalloy Metallurgical Corporation  
Newfield, New Jersey, Ferrovandium Slag

Dear Mr. Swift:

As a follow-up to our telephone conversation of January 6, 1992, please find the following information regarding the referenced slag and the screening procedure. First, I have described the physical characteristics of the slag and baghouse dust (Lime pile) product in Department 111. Secondly, I have provided a summary of the procedure followed for the initial 6,000 ton lot which has been screened and crushed.

Ferrocolumbium (FeCb) and ferrovandium (FeV) slags visually appear similar in regards to shape, size, texture, and color. Both slags are irregularly shaped with a smooth, gray surface and range in sizes from approximately 2' x 2' chunks down to granular material. The baghouse dust, or the lime pile as it sometimes referred to, is visually very distinguishable from the slags. The baghouse dust when dry has a consistency and size similar to that of talcum powder. The baghouse dust is maintained in the Material Storage Yard in the area which is also referred to as the lime pile. Once the dust has been exposed to the weather, it forms a crust and has a white, sandy appearance. The lime pile or baghouse dust is also easily distinguishable from the surrounding soils because of its light color and distinctive texture.

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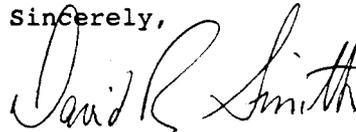
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SMC has screened and sampled an initial batch of 6,000 tons of the FeV slag using the following procedure. Heavy equipment (i.e., front-end loaders and excavators) accessed the FeV slag piles and moved the slag to a lay-down area where the slag was spread evenly on the ground in rows. Radiation technicians then performed gamma radiation scan surveys using sodium iodide (NaI) detectors to reasonably assure that no material emitting elevated levels of radiation would be transferred off-site. The criterion which SMC and its radiological engineers, Hilbert Associates, established for determining elevated material was a radiation level that was twice the background in the lay-down area. The background level measured prior to moving any of the material into the lay-down area was approximately 30  $\mu$ R/hr. This screening criterion of 60  $\mu$ R/hr (twice background) was a very conservative method of assuring that the screened material contains no appreciable amount of FeCb contamination since the FeCb slag has elevated radiation levels in the range of 200-500  $\mu$ R/hr at contact. SMC's procedure requires that any material above this 60  $\mu$ R/hr criterion be marked and removed to a separate control area. The technicians maintained daily log books of their activities documenting adherence to these procedures.

After the first batch of FeV slag was screened, it was stockpiled in anticipation of crushing. The crushing operation began after the majority of the 6,000 tons of the FeV slag had been radiologically screened with the NaI detectors. Samples of the slag were collected immediately after crushing occurred. Samples were taken of the fines generated by the crushing as the slag egressed from the crusher on the conveyor belt. Four samples were collected for every 1,000 ton lot. These samples were sent off-site by our subcontractor for isotopic analysis. Gamma spectrometry was used to measure thorium 234 of the uranium 238 series and actinium 228 of the thorium 232 series. The results for the uranium 238 series range between 2.4 and 15 pCi/g with an average of 5.4 pCi/g. The range for the thorium 232 series was 4.6 to 10.3 pCi/g with an average of 8.3 pCi/g.

I would like to thank you in advance for your assistance in trying to resolve any outstanding issues associated with this matter. If you have any questions or need additional information, please do not hesitate to contact Mr. Craig Rieman or myself.

Sincerely,



David R. Smith  
Director of Environmental Services

DRS:lms

CC: Yawar H. Faraz, USNRC  
Craig R. Rieman