December 7, 2000

Mr. David R. Smith
Radiation Safety Officer
Shieldalloy Metallurgical Corporation
P.O. Box 768
Newfield, NJ 08344

SUBJECT: SHIELDALLOY METALLURGICAL CORPORATION - REQUEST FOR ADDITIONAL INFORMATION REGARDING DECOMMISSIONING FUNDING PLAN (TAC NO. 31338)

Dear Mr. Smith:

This refers to your application dated April 20, 2000, which contained a revised decommissioning funding plan.

Our review of your application has identified additional information that is needed before final action can be taken on your request. The additional information, specified in the enclosure, should be provided within 60 days of the date of this letter.

In addition, a copy of your submittal has been forwarded to the License Fee and Accounts Receivable Branch, Office of the Chief Financial Officer, who will contact you separately if the appropriate license fee has not been submitted for your request, as your request is subject to full cost recovery.

If you have any questions regarding this matter, I can be reached on (301) 415-7292 or by e-mail at jao@nrc.gov.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,
/RA/

Julie A. Olivier, Project Manager
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety and Safeguards
Office of Nuclear Material Safety and Safeguards

Docket 40-7102
License SMB-743
Enclosure: Request for Additional Information

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Radiation Safety Officer
Shieldalloy Metallurgical Corporation
P.O. Box 768
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Docket 40-7102
License SMB
Enclosure: Request for Additional Information

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REQUEST FOR ADDITIONAL INFORMATION
APPLICATION DATED APRIL 20, 2000
DECOMMISSIONING FUNDING PLAN
SHIELDALLOY METALLURGICAL CORPORATION, NEWFIELD, NEW JERSEY
40-7102

INTRODUCTION

Shieldalloy Metallurgical Corporation in Newfield, New Jersey, submitted a revised decommissioning funding plan (DFP) dated April 20, 2000. The Licensee responded to Nuclear Regulatory Commission (NRC) comments sent in a letter dated February 11, 2000. The April 20 submission addresses estimated decommissioning costs for the Licensee's manufacturing facility in Newfield, New Jersey, which is covered by license SMB-743 issued under 10 CFR Part 40. The cost estimate totaled $2,469,043.75. The Licensee's cost estimate was prepared using the guidance contained in Draft Regulatory Guide DG-3014 (Proposed Revision 1 to Regulatory Guide 3.66) "Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70, and 72." The staff used Draft Regulatory Guide DG-3014, NUREG/CR-6744, "Revised Analysis of Decommissioning Reference Non-Fuel-Cycle Facilities," and Draft Regulatory Guide DG-4006, "Demonstrating Compliance with the Radiological Criteria for License Termination," as well as applicable regulations in reviewing the cost estimate.

ACCEPTANCE OF THE DFP DOES NOT CONSTITUTE NRC APPROVAL OF THE DECOMMISSIONING PROCEDURES PROPOSED BY THE LICENSEE

Shieldalloy submitted a DFP in accordance with 10 CFR 40.36(d). The DFP proposed that decommissioning will be performed using on site disposal of all residual radioactivity located at the site. However, the Licensee has not submitted a decommissioning plan, pursuant to 10 CFR 40.42, which requires certain information to demonstrate that the procedures proposed in the DFP will in fact meet the regulatory requirements for license termination. Furthermore, the provisions of 10 CFR 20.1403 require additional information for decommissioning plans submitted in support of license termination under restricted conditions. The information required for a DFP does not include the more extensive information required of the decommissioning plan. Consequently, the approval of decommissioning procedures is explicitly provided for under 10 CFR 40.42(g)(3), which applies to the decommissioning plan. In view of these requirements, the Licensee must realize that acceptance of the DFP does not constitute NRC approval of the decommissioning procedures proposed in the DFP. It is possible that the Licensee may need to revise the decommissioning procedures proposed in the DFP in order to obtain NRC approval of the decommissioning plan.

Therefore, because the decommissioning procedures may ultimately require revision to obtain NRC approval, the decommissioning costs may change significantly based on the final approved decommissioning plan. In the event the cost estimate increases, the Licensee must provide financial assurance sufficient to cover those costs at that time (ref. 10 CFR 40.42(e)).

SPECIFIC COMMENTS ON THE DFP

The DFP should be revised in accordance with the comments listed below in order to assure adequate financial assurance for the cost of decommissioning in the manner proposed by the Licensee in the DFP.

(1) Provide Certification of Financial Assurance and Signed Original Financial Instruments (10 CFR 40.36(d)).

Shieldalloy stated it intends to provide financial assurance instruments after the DFP is approved. However, 10 CFR 40.36(d) requires that the DFP contain a certification by the Licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning and a signed original of the financial instrument obtained to satisfy the requirements 10 CFR 40.36(e).

The Licensee should submit the required certification and signed original financial instruments with its revised DFP.

(2) Clarify the Release Criteria That Will Be Used for License Termination (10 CFR Part 20).

Page 9 of the DFP states, "The criteria for allowing release of sites for unrestricted use are shown in 10 CFR 20.1402." However, on page 10, the DFP states, "... an analysis must be conducted to verify that exposure to members of the public is limited to less than 100 mrem per year in the event that land use controls fail." The 100 mrem per year criterion applies to license termination under restricted conditions as defined in 10 CFR 20.1403. The DFP does not specifically state which set of criteria will be applied to the site. The cost of decommissioning is significantly affected by the choice of criteria.

The Licensee should state which set of criteria it intends to use to decommission the site.

(3) Verify That the DFP Cost Estimate Provides For Removal of Residual Radioactivity Adequate to Decommission the Facility to Meet Applicable Dose Limits and ALARA Goals (10 CFR Part 20).

Page 10 of the DFP states, "The maximally-exposed individual, after licensed operations have ceased, would not receive an annual radiation dose above 25 millrem total effective dose equivalent (TEDE)." In contrast, both 10 CFR 20.1402 (unrestricted use criteria) and 10 CFR 20.1403 (restricted conditions) require that the annual dose limits be applied to the "average member of the critical group." The applicable regulations further require that residual radioactivity be reduced to levels that are as low as reasonably achievable (ALARA), as well as other public and environmental considerations. The information submitted with the DFP is not sufficient to determine whether the stated exposure goals are equivalent to the regulatory requirements. The definition of dose used in the DFP is important because it can significantly affect the cost of decommissioning.

The Licensee should verify that the DFP cost estimate provides for removal of residual radioactivity adequate to decommission its facility to meet the dose limits and ALARA goals defined in 10 CFR 20.1402 or 20.1403, as applicable.

(4) Submit Additional Detail to Support the Cost Estimate (*Draft Regulatory Guide DG-3014*, pages 24 through 33, and *NUREG/CR-6744*, Appendices A and E).

The cost estimate does not include sufficient detail to allow an adequate evaluation of decontamination and/or dismantling costs and long-term surveillance costs. In particular, the submission does not include the following information:

- Characterization of excavated soils from previous remedial activities currently stored on site (pages 3 and 11 of the DFP refer to previously excavated soils stored in the Storage Yard);

- Detailed description of the method for estimating the volume of slag used as fill material on site (mentioned on pages 7 and 8 of the DFP);

- Detailed breakout of the cost of the engineered waste disposal cap, including costs of labor, equipment/supplies, the shielding layer, the geotextile liner, the drainage layer, the frost protection layer, the vegetative layer, and the proposed drainage controls;

- Detailed breakout of the labor and equipment/supply costs for each activity related to site stabilization and long-term surveillance (listed on page 8 of Appendix C to the DFP);

- Detailed breakout of the labor and equipment/supply costs for scabbling floor spaces requiring decontamination; and

- Types of radiological survey equipment required.

In order to support an evaluation of the estimated decommissioning costs, the Licensee should revise its cost estimate to include the information listed above and to increase the level of detail, especially for decontamination and/or dismantling costs and long-term surveillance costs. The revised cost estimate should be consistent with the cost estimating tables on pages 24 through 33 of *Draft Regulatory Guide DG-3014* (see tables 3.10, 3.15, 3.16, and 3.17). The Licensee should use the tables found in Appendices A and E of NUREG/CR-6477, "Revised Analyses of Decommissioning Reference Non-Fuel-Cycle Facilities," July 1998, as a guide to the costs normally encountered in decommissioning projects.

(5) Revise the Engineered Cap Cost Estimate to Include Surface Area Driven Costs.

In response to a February 11, 2000, letter from NRC to the Licensee, the Licensee describes the use of a ratio/scaling factor for the cost of capping the residual radioactivity in the Storage Yard after site-wide decommissioning. The response describes this factor as the volumetric ratio of the Newfield-to-Cambridge disposal areas. However, the estimated costs for the engineered cap based on this volumetric method do not account for the volume of process equipment and construction debris that cannot be decontaminated for unrestricted use, which, according to page 11 of the DFP, will also be placed under the cap.

In addition, some costs associated with the engineered cap should be calculated as a function of the *surface area* of the cap rather than the volume of material under the cap. For example, page 11 of the DFP states that the pile will be covered with a shielding layer, a geotextile liner, a drainage layer, a frost protection layer, and a final vegetative

layer. The costs associated with these layers will be driven by the surface area to be capped, not the volume of disposed waste.

The Licensee should adjust the engineered cap cost estimate to consider surface area driven costs. The estimate should include costs for disposing the volume of all equipment/wastes which will be placed under the cap.

(6) Clarify Inconsistencies in Information Used to Support the Cost Estimate.

The dimensions of facility areas provided in the cost estimating tables on pages 19 through 22 of the DFP are inconsistent with the text descriptions of these same areas on pages 4 through 6 of the DFP. In particular, the following inconsistencies have been noted:

- Page 4 of the DFP lists a total surface area of 8,710 m^2 for building D111, whereas page 19 provides a total surface area for floors, walls, and ceilings in D111 of 6,689 m^2. Page 19 contains small errors that should be corrected: Line 9, column 3 states the surface area of the floors is 930 m^2, while column 4 of that line states the area as 929 m^2. Line 11, column 3 incorrectly states the total wall area as 2973 m^2, rather than 2974 m^2.

- Page 5 of the DFP lists a total surface area of 375 m^2 for the Flex-Kleen Baghouse, whereas page 19 provides a volume of 5,574 m^3 for the Flex-Kleen Baghouse and associated ducting. Furthermore, page 6 of Appendix C implies that this volume of 5,574 m^3 is filter bags and residual dust.

- Page 5 of the DFP lists a total surface area of 7,950 m^2 for building D102, whereas page 22 provides a total surface area for walls and ceilings in D102/D112 of 4,645 m^2 and a volume of 18 m^3 or 19 m^3 for the floor. The discrepancy between the floor volume values listed in columns 3 and 4 on page 22 should also be corrected.

- Section 2.4 of the DFP discusses the Storage Yard. The section lists 20,000 m^3 of slag and 20,000 m^3 of baghouse dust as stored in the Storage Yard, whereas page 20 lists 43,000 m^3 slag and 10,000 m^3 of baghouse dust. Furthermore, footnotes 14 and 16 on page 6 indicate that a 1991 fly-over estimated 17,840 m^3 of slag and 15,100 m^3 of baghouse dust in the Storage Yard.

- Section 2.4 of the DFP does not mention excavated soils stored in the Storage Yard, whereas page 20 lists 6,500 m^3 of excavated soils. Page 11 of the DFP states that the excavated soils will be placed under the engineered cap.

- Table 3.11 of Attachment B incorrectly transcribes numbers of workers estimated for restoration of contaminated areas on facility grounds from Table 3.8

The font size used in the tables included in Attachment B of the submittal results in very small superscripts for the abbreviations of area and volume, such that the exponents (2 and 3) are difficult to distinguish. The Licensee should revise the tables to clearly distinguish units of area and volume.

Inaccurate estimates of surface areas and volumes in the cost estimating tables may result in an understatement of decontamination and dismantling costs as well as waste disposal costs. Therefore, in order to allow an adequate evaluation of the estimated decommissioning costs, the Licensee should clarify the inconsistencies noted above.

(7) Substantiate Assumptions Regarding the Extent of Contamination at the Facility.

The Licensee has not adequately supported its assumptions regarding the surfaces that require decontamination at the facility. The cost estimate assumes a relatively small proportion of the surface areas will require decontamination. The assumption may lead to an understatement of the cost of decontamination. Cost calculations on pages 4 through 6 of Appendix C to the DFP are based on the following assumptions:

- On page 4 of Appendix C to the DFP, the Licensee states that "For the purposes of cost estimating, it was assumed ~ 450 m^2 of D111 floor space requires decontamination, ~370 m^2 of Flex Kleen Baghouse pad, [and] 110 m^2 of the AAF pad require decon." However, the Licensee has not explained why these surface area assumptions are reasonable. In addition, the DFP does not identify the quantity of contaminated floor space associated with building D102/D112.

- On page 5 of Appendix C to the DFP, the Licensee states that "It is assumed based on quarterly surveillance surveys that the [wall] panels are not contaminated greater than the release criteria, but steel beams are contaminated (covered with accumulated dust from plant operations)." A similar statement is made with regard to the ceiling panels. However, the Licensee does not explain why steel support beams would be covered with accumulated dust from plant operations (and thus contaminated sufficiently to require decontamination), but walls and ceiling panels held up by the beams would not be contaminated to the extent that decontamination is needed.

- On page 6 of Appendix C to the DFP, in regard to the ventilation and ductwork associated with building D111 and the Flex Kleen Baghouse, the Licensee states that "Based on the radiological condition of the AAF Baghouse when it was disassembled, it can be assumed that the majority of the metal will not be contaminated at levels greater than the release criteria." However, the Licensee does not explain what the radiological condition of the AAF Baghouse was before disassembly. Nor does the Licensee discuss changes to the manufacturing process or operating conditions of the baghouse, if any, after the Flex Kleen air handling system was installed. The Licensee should discuss the radiological, process, and operating parameters before and after the installation of the Flex Kleen system in order to establish the likely radiological condition of the Flex Kleen Baghouse.

Underestimation of areas that require decontamination may result in a significant understatement of the decontamination costs. The Licensee should revise its cost estimate to account for all surface areas that may require decontamination and provide additional support for the assumptions given in Appendix C to the DFP.

(8) Revise the Cost Estimate to Include Contractor Profit (*Draft Regulatory Guide DG-3014*, page 21, and NUREG/CR-6477, Appendix A).

The Licensee's cost estimate assumes that the decommissioning work will be performed by a contractor. Although the estimate includes contractor overhead, the estimate does not appear to account for 15 percent profit on labor and overhead, as recommended for estimating the costs of contractor staff on page 21 of *Draft Regulatory Guide DG-3014* and in Appendix A of NUREG/CR-6477:

COMPARISON OF LICENSEE LABOR RATE ESTIMATES TO RATES RECOMMENDED BY REGULATORY GUIDANCE

	Daily Rate ($/work day) (Licensee's estimate)	Daily Rate ($/work day) (Recommended Includes 15% profit)
Supervisor	840	966
Foreman	640	736
Health Physicist	1,080	1,242
Laborer	336	386
Clerical	336	386

Unless contractor profit is fully included, the cost estimate may not be adequate to cover all decommissioning costs. For example, adding 15 percent profit to the labor rates reported in the cost estimate would increase the Licensee's estimated decommissioning costs by over $100,000. The Licensee should revise its estimated labor rates as necessary to reflect all contractor profit, or provide justification for the rates used.

(9) Revise or Justify Estimates for Waste Disposal (NUREG/CR-6477).

The cost estimate submitted by the Licensee did not include several cost items that normally are included in waste disposal costs:

- Pages 5 and 6 of Appendix C to the DFP discuss HEPA vacuuming and pressure washing of walls, ceilings, and equipment, but the cost estimate does not include costs for treatment and disposal of wastewater generated by these decontamination activities and disposal of personal protective equipment used by workers.

- Tables 3.14 (a) through (c) of the DFP assume zero cost for packaging, shipping, and off-site disposal of waste radioactive material.

- Table 3.15 in the DFP cost estimate does not include any non-labor costs (e.g., packaging materials, containers, etc.) for on-site disposal of facility building components, equipment, certain decontamination wastes, slag, baghouse dust, and contaminated soil.

Based on these observations, the Licensee's cost estimate may understate the costs of waste disposal. The Licensee should:

- Include costs for treatment and disposal of wastewater generated by decontamination activities and disposal of personal protective equipment used by workers.

- Justify the assumption that no offsite radioactive waste disposal will be necessary.

- Include any non-labor costs for on-site waste disposal.

Tables provided in NUREG/CR-6477 may prove helpful for estimating the quantity of waste generated in decontaminating individual facility components.

(10) Revise the Estimate of Site Stabilization and Long-Term Surveillance Costs.

The decommissioning cost estimate submitted by the Licensee includes an estimate of $358,050 for site stabilization and long-term surveillance of the engineered disposal cap. This estimate should be revised to address the following observations:

- *Draft Regulatory Guide DG-4006* "Demonstrating Compliance with the Radiological Criteria for License Termination" (August 1998), page 33, states that it is acceptable to assume up to a 2 percent real rate of return on funds set aside for site control and maintenance. However, the cost estimate submitted by the Licensee applies a discount rate of 7 percent to all site stabilization and long-term surveillance costs.[1]

- The Licensee applies the discount rate incorrectly to the total estimated costs for site stabilization and long-term surveillance. Specifically, to calculate the figure used for site stabilization and long-term surveillance costs in the cost estimate, the Licensee multiplies the sum of all site stabilization and long-term surveillance costs over a 1,000-year period by the discount rate of 7 percent (i.e., $5,115,000 x 0.07 = $358,050). This calculation, which is not consistent with generally applied discounting methods, results in an estimate that is probably higher than would result if an assumed 2 percent real rate of return had been applied correctly. To arrive at an appropriate amount, the estimate should determine the annual site stabilization and long-term surveillance cost and divide that figure by 2 percent. For example, if we assume the cost of site stabilization and long-term surveillance cost is $5,115 ($5,115,000 ÷ 1000 yr.) annually, then this figure should be divided by 2 percent to yield a present value estimate of $255,750 (i.e., $5,115 ÷ 0.02 = $255,750).[2]

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[1] As implemented in the Licensee's cost estimate, this 7 percent rate is effectively a real rate, rather than a nominal rate.

[2] If this amount of money were invested to provide a real rate of return of 2 percent, the annual earnings of the fund would be just enough to pay the annual cost of $5,115 (i.e., $255,750 x 0.02).

- The annual cost assumed for long term surveillance may be understated in the DFP. The Licensee relied on costs documented in NUREG-1543[3], which was issued in July 1996. However, those costs may no longer be appropriate due to new regulations[4] issued on July 21, 1997 that define the radiological criteria for license termination. Estimates of decommissioning costs made after issuance of the new rules indicate higher amounts are needed for long term surveillance of sites released under restricted conditions. For example, in NUREG/CR-6744 (Page E.7 and Table E.6, page E.9), the cost of long term surveillance for a tailings pile/evaporation pond (100 m long by 50 m wide) capped with asphalt and covered with grass is about $17,000 annually. NUREG/CR-6744 was issued in July 1998 to update decommissioning costs for non-fuel cycle facilities, such as the one operated by the Licensee. The amount estimated by NUREG/CR-6744 would require a fund of $850,000 to provide financial assurance for an annual cost of $17,000, using a 2 percent annual rate of return.

To ensure that the cost estimate is adequate, the Licensee should revise the estimate of site stabilization and long-term surveillance costs. Specifically, the Licensee should determine and specify the annual site stabilization and long-term surveillance cost, and then should divide that figure by 2 percent to determine the appropriate funding amount.

(11) Revise or Justify Estimates for Radiological Survey Equipment (NUREG/CR-6477).

The Equipment/Supply Costs schedule included in the cost estimate lists a $500 unit cost for radiological survey equipment. Appendix A of NUREG/CR-6477, however, recommends a unit cost ranging from $240 to $10,800, depending on the type of detector used.

To ensure that the cost estimate accurately reflects radiological survey equipment costs, the Licensee should modify its radiological survey equipment unit cost or justify the cost provided in the cost estimate.

(12) Adjust the Cost Estimate As Necessary to Reflect Current Dollars (*Draft Regulatory Guide DG-3014,* pages 22 and 23).

It is not clear whether the overall cost estimate submitted by the Licensee has been adjusted to reflect current dollars. For example, according to page 9 of Appendix C to the DFP, the estimated cost of the waste disposal cap is based on the 1996 costs for construction of a similar waste disposal cap at another facility. Pages 22 and 23 of *Draft Regulatory Guide DG-3014* state that cost estimates should be adjusted for inflation and other changes in the prices of goods and services.

To ensure that the cost estimate is adequate, the Licensee should adjust all costs as necessary to reflect current dollars.

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[3] NUREG-1543, "Draft Environmental Impact Statement Decommissioning of the Shieldalloy Metallurgical Corporation Cambridge, Ohio, Facility," issued July 1996 by the USNRC.

[4] Federal Register, July 21, 1997, pages 39058 through 39092, Radiological Criteria for License Termination, Final Rule.