SHIELDALLOY METALLURGICAL CORPORATION

12 WEST BOULEVARD
P.O. BOX 768
NEWFIELD, NJ 08344-0768
TELEPHONE (856) 692-4200

DAVID R. SMITH
ENVIRONMENTAL MANAGER
Aluminum Products & Powders Division

M516
P-5

April 30, 2003

Ms. Sheryl Villar
Licensing Assistance Team
Division of Nuclear Materials Safety
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406-1415

040-07102
X

Re: Application to Renew License No. No. SMB-743 (Control No. 132074)

Dear Ms. Villar:

The purpose of this letter is to request that the U. S. Nuclear Regulatory Commission (USNRC) renew the referenced radioactive materials license to permit on-going remediation activities to be completed, followed by "storage only" of all residual radioactivity pending decommissioning. The enclosure to this letter contains our application and relevant attachments.

Please call me at (609) 692-4200, extension 226 if I can answer any questions, or provide you with additional information to facilitate your review. We look forward to timely renewal of License No. SMB-743.

Sincerely,

David R. Smith
Radiation Safety Officer

cc: Eric Jackson
Joe Deigle
Charles L. Harp, Esq. - Archer & Greiner
Carol D. Berger, C.H.P. - IEM
Melvyn N. Leach, Chief Fuel Cycle Licensing Branch, USNRC
Marie Miller - USNRC Region 1

REVISED RENEWAL APPLICATION

NRC FORM 313 U. S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0120 EXPIRES: 08/31/2002

(8-1999)
10 CFR 30, 32, 33
34, 35, 36, 39 and 40

APPLICATION FOR MATERIAL LICENSE

Estimated burden per response to comply with this mandatory information collection request: 7.4 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

LICENSING ASSISTANT SECTION
NUCLEAR MATERIALS SAFETY BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

SAM NUNN ATLANTA FEDERAL CENTER
U.S. NUCLEAR REGULATORY COMMISSION, REGION II
61 FORSYTH STREET, S.W., SUITE 23T85
ATLANTA , GEORGIA 30303-8931

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
801 WARRENVILLE RD.
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TX 76011-8064

040-07102
SMB-743

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

☐ A. NEW LICENSE
☐ B. AMENDMENT TO LICENSE NUMBER _____
■ C. RENEWAL OF LICENSE NUMBER SMB-743

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip code)*

Shieldalloy Metallurgical Corporation
12 West Boulevard, PO Box 768
Newfield, NJ 08344

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

Shieldalloy Metallurgical Corporation
12 West Boulevard
Newfield, NJ 08344-0768

4. NAME OF PERSON TO CONTACTED ABOUT THIS APPLICATION

David R. Smith., Radiation Safety Officer

TELEPHONE NUMBER

(856) 692-4200, ext. 226

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE. *[See Attachments]*

5. RADIOACTIVE MATERIAL
a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT

10. RADIATION SAFETY PROGRAM

11. WASTE MANAGEMENT

12. LICENSE FEES *(see 10 CFR 170 and Section 170.31*

FEE CATEGORY Exempt | AMOUNT ENCLOSED $ 0

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENT AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30,32,33,34,35,36,39 AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFYING OFFICER – TYPED/PRINTED NAME AND TITLE	SIGNATURE	DATE
Joe Diegel, Vice President and General Manager		4/2003

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED $	CHECK NUMBER	COMMENTS
APPROVED BY				DATE	

APPLICATION CONTENTS

Application Items 5 and 6
Radioactive Material (Type, Form and Use)

Radionuclide	Chemical/Physical Form	Site Limit (kg)	Intended Use
Thorium-232	Any form suitable for transport under DOT regulations	5.5×10^6	Shipping, possession, use, research, development and storage incident to facility decontamination pursuant to the 04/28/03 work plan, followed by "storage only" pending decommissioning.[3,4]
Uranium-238	Any form suitable for transport under DOT regulations	6.9×10^5	Shipping, receiving, possession, use, research, development and storage incident to facility decontamination pursuant to the 04/28/03 work plan, followed by "storage only" pending decommissioning.[5,6]

[3] PARS Environmental Inc., "Work Plan for the Decontamination and Disassembly of D111 and D102/112 Production Departments and Flex-Kleen Baghouse", Report No. 610-01, April, 2002 (copy included herein).

[4] PARS Environmental Inc., "Final Status Survey Plan for the Remediated D111 and D102/112 Production Departments and Flex-Kleen Baghouse", to be submitted under separate cover within 30 days of the date of this renewal application.

[5] PARS Environmental Inc., "Work Plan for the Decontamination and Disassembly of D111 and D102/112 Production Departments and Flex-Kleen Baghouse", Report No. 610-01, April, 2002 (copy included herein).

[6] PARS Environmental Inc., "Final Status Survey Plan for the Remediated D111 and D102/112 Production Departments and Flex-Kleen Baghouse", to be submitted under separate cover within 30 days of the date of this renewal application.

Work Plan for the Decontamination and Disassembly of D111 and D102/112 Production Departments and Flex-Kleen Baghouse

PARS
Environmental
Inc.

Suite A
6 South Gold Drive
Robbinsville, NJ 08691

Tel : 609-890-7277
Fax: 609-890-9116

Work Plan
for the
Decontamination and Disassembly
of
D111 and D102/112
Production Departments
and
Flex-Kleen Baghouse

Shieldalloy Metallurgical Corporation

Report No. 610-01

PARS
Environmental
Inc.

Work Plan

for the

Decontamination and Disassembly

of

D111 and D102/D112 Production Departments

and

Flex-Kleen Baghouse

Submitted to:

Shieldalloy Metallurgical Corporation
12 West Boulevard
Newfield, NJ 08344
(609) 692-4200

Prepared by:

PARS Environmental Inc.
6 South Gold Drive, Suite A
Robbinsville, NJ 08691
(609) 890-7277

Report No. 610-01
April 2002

TABLE OF CONTENTS

I. INTRODUCTION

Shieldalloy Metallurgical Corporation (SMC) operates a facility located in Newfield, NJ. This facility manufactures or has manufactured specialty steel and super alloy additives, primary aluminum master alloys, metal carbides, powdered metals, and optical surfacing products. Raw materials currently used at the facility include beneficiated ores which contain oxides of columbium (niobium), vanadium, aluminum metal, titanium metal, strontium metal, zirconium metal and fluoride (titanium and boron) salts. During the manufacturing process, the facility generates a variety of by-products that have commercial application.

Some of the materials received, used or stored by SMC contain radioactive material, which is classified as "source material" pursuant to Title 10 CFR Part 40. The U.S. Nuclear Regulatory Commission has authorized SMC to ship, receive, possess, use, and store source material pursuant to License No SMB-743. The primary forms of source material currently present at the site include ores used as feed to metallurgical operations, byproduct slag used as a slag fluidizer, and baghouse dust. A schematic map of the site, showing the major site features of this plant, is presented on Figure 1 – Site Map.

1.1 Purpose

The purpose of this plan is to detail the activities to be performed for the decontamination and disassembly of the D111 and D102/D112 Production Departments and the Flex-Kleen Baghouse. The overall goal of the decontamination and disassembly of the above-referenced buildings is to remove all radioactive materials such that residual levels permit the buildings to be released for unrestricted use. In this case the buildings are to be removed, since operations in these areas have ceased.

The removal of these buildings is expected to reduce the long-term risk to the general public since the site will be released for the unrestricted use pursuant to 10 CFR 40.42. Short-term risks to the general public and decontamination and disassembly workers will be minimized by following ALARA procedures and all applicable OSHA regulations, including the engineering, administrative and procedural controls that will be used during this project.

Along with this Decontamination and Disassembly Plan, the SMC Radiation Safety Procedures (RSPs) will be used to implement the onsite work, and will be supplemented by the PARS Project Health and Safety Plan, as required.

II. FACILITY INFORMATION

2.1 Contaminants of Concern

SMC is licensed to possess uranium and thorium in any form suitable for transport under Department of Transportation regulations. Previous studies of radionuclide content of the materials typically found at SMC are indicative of a natural distribution of the radioactive progeny of these series radionuclides. The contaminants of concern at SMC and during this project include ^{232}Th plus progeny in equilibrium and ^{238}U plus progeny in equilibrium.

2.2 Release Criteria

SMC Radiation Safety Procedure No. RSP-009, "Contamination Control" contains the release criteria for the SMC Newfield facility. These criteria are shown in Table 1.

For the walk-over survey after the removal of the buildings, a screening level of 15 microR per hour above background, at a distance if two (2) centimeters from the soil surface may also be used. At any location that exhibits an exposure rate in excess of this value will be subject to additional investigation and/or remediation.

Material and soil/dust that are below the SMC Newfield release criteria will be classified as unrestricted. Materials that exceed the SMC Newfield release criteria will be decontaminated using HEPA-vacuuming and/or more aggressive means, such as steam cleaning, if necessary, to classify the material as unrestricted. In the event that the material cannot be effectively decontaminated to below release criteria or soil/dust exceeds the release criteria, the material and soil/dust will be properly managed according to SMC Procedures and USNRC Regulations.

2.3 Building/Production Department Descriptions

A brief description of the former operation at each of the buildings, included in this project, is provided in the following sections.

2.3.1 Production Department D102

Production Department D102 produced pure metals and alloys by reducing metal oxides with aluminum powder, known as the aluminothermic process. D102 and the production of chromium metal began very early in the history of the SMC plant. In addition to the aluminothermic process, D102 also housed the stockpile of CANAL© crushing/sizing/packaging operation. The building is equipped with a furnace, crushing equipment, scales, bagging equipment, and other miscellaneous items. D102 is a "Restricted Area", but is no longer stores licensable material, in the form of CANAL©.

The current building was constructed in 1958. The overall building is 54 feet wide and 300 feet long. The aluminothermic department utilized 73% of the building with the balance utilized for the crushing and packaging department, as described in Department D112.

2.3.2 Production Department D111

Production Department D111, or the ferrocolumbium production department, was the predominant location where source material was used. It is equipped with an operator room, mechanical booms, heavy equipment handlers, storage containers, scales, a variety of melting pots, two furnaces, a dust collection system, and other miscellaneous items. D111 is a "Restricted Area", but no licensable material, in the form of slag and pyrochlore, are present at this time.

The original building was purchased from the Federal Government and moved from Montana to Newfield, New Jersey in 1964. The original structure is 80 feet by 90 feet. An additional structure was added, also in 1964, that is 22 feet by 71 feet. In 1981, the D111 was expanded with the addition of another building, approximately 135 feet by 123 feet wide. The building is 70 feet tall at the peak. D111 is constructed of wood and metal.

It the past, ferrocolumbium slag may have been used on-site as fill material for certain construction projects within the SMC plant. Should fill slag be encountered, through survey results or from disassembly operations, the slag shall be extracted and transported to the Storage Yard. Fill slag may be encountered in D102 and D111.

2.3.3 Production Department D112

Production Department D112 crushes all lump alloy smelted or melted at the SMC plant. D112 is capable of taking pieces as large as twenty-four inches in diameter. The lump alloy was then crushed, sized, and packaged to a variety of forms. Allow could be sized from four inch to 8 mesh down through several different crushing systems. The sized alloy could be either delivered to another department for further processing or packaged in its final form for shipment to a customer.

D112 did not process source material, but is contained within the same structure as D102. D112 shares the 54 feet by 300 feet building with D102, and utilized approximately 27% of the building for its operations.

2.3.4 Flex-Kleen Baghouse

The Flex-Kleen Baghouse system was installed in 1987. It was designed to draw up to 200,000 cfm, and typically operated in concert with the former AAF Baghouse system. Pulsed air jets in the Flex-Kleen Baghouse removed the dust generated in the ferrocolumbium production department (D111). The dust was then conveyed via a series of screw conveyors through filter bags and collected into storage bins. When the storage bins were full, the dust was taken to the Storage Yard. The building is equipped with storage bins, filter bags, and other miscellaneous

items. The Flex-Kleen Baghouse is a "Restricted Area", because of the baghouse dust, which is still present inside the system and associated ductwork.

2.4 Limited Historical Site Assessment

Information on historical and current radiological contamination levels, as part of SMC's Radiation Protection Program were reviewed to obtain a general characterization of the buildings targeted in this Plan. The available Quarterly Survey Reports from the 4th Quarter of 1997 through the 2nd Quarter of 2001 were reviewed in this section. The information that follows for each of the areas, with the exception of D112, is:

- **Ambient Gamma Exposure Rates**: measured in various areas of the facility, following a similar protocol as described in section 3.4 of this Plan.
- **Total Surface Contamination Levels**: measured on surfaces, including floors, desks, equipment, tables, and other accessible horizontal surfaces, following a similar protocol as described in section 3.4 of this Plan.

Summaries of the *maximum* Ambient Gamma Exposure Rates and Total Surface Contamination values measured during the respective calendar quarter are summarized in Table 2 and 3, respectively.

Additionally, Total Surface Contamination Levels that were *well above average* for each calendar quarter are plotted, in Figures 2, 3a, 3b, 3c and 4, to provide a visual geographic distribution of maximum contamination levels that are to be expected. These maximum values were compared to the site-specific release criteria to characterize the buildings.

No evidence or reports of catastrophic events such as spills or fires exist.

The information presented in this section of the Plan will be used to scope additional surveys and the decontamination effort prior to the disassembly of the buildings.

2.4.1 Production Department D102

Ambient Gamma Exposure Rates measured in D102 ranged from background to 1500 microR/hour. All of the results were lower than 5,000 microR/hour, therefore does not require posting as a "Radiation Area" according to 10 CFR 20.1902.

As Figure-2 shows, Total Surface Contamination values ranged from background to a maximum of 2000 dpm (alpha)/100cm^2. The highest values were primarily located on a concrete area outside of the bay door on the East side of the building. This is the only area in D102 that is expected to exceed the site-specific release criteria.

2.4.2 Production Department D111

Ambient Gamma Exposure Rates measured in D111 ranged from background to 900 microR/hour. All of the results were lower than 5,000 microR/hour, therefore does not require posting as a "Radiation Area" according to 10 CFR 20.1902.

As Figures-3a, 3b, and 3c show, Total Surface Contamination values ranged from background to a maximum of 583 dpm (alpha)/100cm^2. The highest value approaches, but does not exceed the site-specific release criteria.

2.4.3 Flex-Kleen Baghouse

Ambient Gamma Exposure Rates measured in Flex-Kleen Baghouse area ranged from background to 40 microR/hour. All of the results were lower than 5,000 microR/hour, therefore does not require posting as a "Radiation Area" according to 10 CFR 20.1902.

As Figure-4 shows, Total Surface Contamination values ranged from background to a maximum of 2444 dpm (alpha)/100cm^2. The primary source of radiological contamination is the remaining dust bags and residual dust in the system. Many areas are expected to exceed the site-specific release criteria.

III. PROJECT METHODOLOGY

3.1 PROJECT ORGANIZATION

All field work will be managed by **Mr. Ravi Jarecha, CET** and **Mr. Robert Confer, CIH**. During the performance of the work described in this Plan, Mr. Jarecha will be the Field Supervisor. He will be the primary person responsible for designating the temporary restricted area in which work is to be performed, directing the work of other support staff, performing the survey activities, and preparing the Final Status Survey Report. Mr. Confer will be the Technical Field Supervisor. He will serve as the additional primary person responsible in the event that two PARS employees are required to be on-site and as support to all field operations.

Technical oversight for the entire project is the responsibility of **Dr. Edward A. Christman, CHP**. Dr. Christman has reviewed and approved this Plan, will assist in the review of the quality of the data collected and the preparation of the Final Status Survey Report, and provide an interface between SMC and project personnel.

Mr. Louis Apoldo, PE will provide be the senior advisor for the construction, disassembly, and decontamination phases of this Plan. **Dr. Harch S. Gill** will ensure that work has been followed in accordance to this Plan and USNRC guidelines.

A brief narrative of each member of the PARS Project Team is included in Appendix A of this Plan.

Also, on the Project Team is Summit Compliance, a contractor to SMC, who will provide personnel, materials and equipment necessary for the decontamination and disassembly of the buildings included in this Plan. Summit will also provide a field supervisor, **Mr. Robert Bennet**, to oversee the crew of decontamination and disassembly personnel.

3.2 PRE-WORK ACTIVITES/H&S PLAN

Prior to the start of work, personnel that will be involved with the project will attend an initial tailgate safety briefing, which will cover this Plan and its implementation. Participants in this project should have current 40 Hour OSHA HAZWOPER and Confined Space Entry training.

As part of the pre-work activities, work areas shall be established, which includes the posting of the areas as required, establishing the work boundary, and set up and placement of equipment to be used during this project. PARS field personnel will perform pre-work radiation and contamination surveys of the work areas and will generate a SMC Radiation Work Permit, as required, for the project based on the results of the survey. Additionally, the PARS Health and Safety Plan shall be reviewed and signed by all personnel involved in this project.

3.4 FIELD INSTRUMENTATION AND PROCEDURES

In order to ensure that Project Team personnel, SMC personnel, and the general public are not exposed to excess air contaminants, including radiological contaminants, the following are types of monitoring and screening that shall be conducted during this project. A list of field instrumentation to be used during this project is listed in Table 4.

3.4.1 Surface (Alpha) Contamination

A Ludlum Measurements, Inc. (Ludlum) Model 43-1 Scintillator (Alpha detector) will be used to measure Total and Removeable surface contamination.

- The instrument will be calibrated according to Manufacturer specifications.
- The instrument will be source checked with ^{230}Th.
- Background measurements will be obtained in areas free of source material.
- Total contamination shall be conducted by scanning impermeable* surfaces (such as concrete, metal and drywall) with the detector held 1/8 inch off the surface being monitored.
  **Alternative procedures, i.e. offsite laboratory analysis, are to be followed for porous surfaces, such as wood, soil, water, etc.*
- The detector will be moved at a rate of one to two inches per second over the surface of the area.
- The measured data shall be recorded on the "Contamination Survey Form"
- This measurement value is the total surface contamination.

When total surface contamination measurements exceed the site-specific release criteria, removable surface contamination (wipe tests) shall be conducted in the following manner:

- A Smear cloth shall be wiped in an "S" shape using moderate pressure.
- The area covered will be approximately $100cm^2$ ($16in^2$).
- The Ludlum Model 43-1 Scintillator shall be used to measure the activity on the smear cloth following the above-described procedure.
- The fixed contamination will be determined by subtracting the removable contamination value from the total surface contamination value.

3.4.2 Ambient Gamma Exposure

A Ludlum Model 19 MicroR Meter (Gamma Surveyor) will be used to measure Ambient Gamma Exposure.

- The instrument will be calibrated according to Manufacturer specifications.
- The instrument will be source checked with ^{238}U or ^{239}Th.
- Background measurements will be obtained in areas free of source material.
- Ambient Gamma Exposure shall be monitored by holding the instrument detector approximately three feet (waist level) from the walking surface.
- The measured data shall be recorded on the "Ambient Gamma Exposure Form"

3.4.3 External and Internal Radiological Exposure

External Radiological Exposure shall be monitored using thermoluminescent dosimeters (TLDs) on personnel and at the SMC fence boundary. TLDs will be deployed on a monthly basis and returned to the supplier for processing and reporting. Records of the deployment and collection shall be documented on the "Dosimeter Deployment Form." Internal Radiological Exposure shall be measured by collecting a known volume of air onto a filter and analyzing the filter with the on-site field instrumentation and/or sending the filter to an offsite laboratory for analysis.

3.4.4 Ambient Air Monitoring Other Than Radiological

Personnel and ambient air monitoring shall be conducted for air contaminants, other than radiological in nature. A known volume of air shall be collected on a filter for analysis and sent to an offsite laboratory for analysis. Potential air contaminants include, but are not limited to, nuisance dust (total and respirable), metal dust, and asbestos fibers. When necessary, confined spaces shall be monitored for oxygen, combustibles, and toxic vapors/gases prior to entry and continuously during entry.

3.5 DECONTAMINATION AND DISASSEMBLY PROCEDURE

Prior to beginning any site work, a general site characterization will be performed by conducting additional contamination survey(s) of all material and building structures, which are safety accessible. The tasks that are to be performed under this Plan are described below:

3.5.1 Decontamination of D102/112

Building D112 is not a restricted area and Building D102, as stated in section 2.3.1, is no longer used to store licensable material. The licensable material was removed from D102 during the second quarter of 1998. Due to the nature of operations in these departments, the contaminated areas are expected to be limited to unpaved and concrete areas that were in contact with slag material in the past.

The first step of the project is decontamination of all material and building structures, which are safety accessible, that exceed the site-specific release criteria. Areas with removable surface contamination will be marked with paint and decontaminated, utilizing HEPA-vacuuming techniques. The dust collected from the HEPA-vacuuming will be transported to the SMC Storage Yard. The marked areas will be re-surveyed after initial decontamination. If an area exceeds the site-specific release criteria after HEPA-vacuuming, the contamination will be considered fixed.

The material with fixed contamination will be marked with a second paint color and targeted for more aggressive decontamination, such as chipping, scrapping, grinding or sand blasting.

3.5.2 Decontamination of D111 and Flex-Kleen Baghouse

The Flex-Kleen Baghouse removed the dust generated in Building D111, the ferrocolumbium production department. The disassembly of the Flex-Kleen Baghouse and Building D111 will be conducted after Building D102/112 has been decontaminated and disassembled.

The first step is removal of the filter bags in the baghouse. The filter bags will be unhooked from their supports, lowered to the base of the baghouse and placed into a container and moved to the SMC Storage Yard. All surfaces of the baghouse will be decontaminated using HEPA-vacuuming techniques.

The baghouse will be surveyed after initial decontamination. If an area exceeds the site-specific release criteria after HEPA-vacuuming, the contamination will be considered fixed and the material will be marked for further decontamination. As the baghouse is disassembled, the baghouse structures will be transported to the inside of Building D111 for an additional survey to release the material or to designate the material for further decontamination, such as chipping, scrapping, grinding or sand blasting. The dust collected from the decontamination will be transported to the SMC Storage Yard.

All visible dust on horizontal surfaces and equipment within D111 will be HEPA-vacummed. Building D111 and the equipment inside will be surveyed after initial decontamination. If an area

exceeds the site-specific release criteria after HEPA-vacuuming, the contamination will be considered fixed, and the material will be marked for further decontamination. The marked areas will be brought to the inside of D111 and designated for further decontamination, such as chipping, scraping, grinding or sand blasting. The dust collected from decontamination will be transported to the SMC Storage Yard.

3.5.3 Disassembly of D102/112

After decontamination has been conducted, the equipment inside of D102/112 will be disassembled. The equipment will be surveyed to ensure that it is below the release criteria. Equipment that is found to exceed the release criteria will be further decontaminated and re-surveyed.

Once all of the internal structures have been effectively decontaminated and removed, the disassembly of the building will be conducted using a trackhoe with a grapple attachment and other heavy equipment, as needed. All building material shall be surveyed to ensure that it is below the release criteria. Building structures that are found to exceed the release criteria will be further decontaminated and re-surveyed.

Large building structures that could not be decontaminated in place shall be moved to a decontamination area for HEPA-vacuuming and further disassembly. Each building structure shall be surveyed and released for unrestricted use or set aside for further decontamination and subsequent surveying.

All unpaved areas, within the footprint of the building, that do not meet the release criteria will be excavated to remove contaminated material. The soil and slag, if encountered, shall be transported to the SMC Storage Yard.

3.5.4 D111 and Flex-Kleen Baghouse

After decontamination has been conducted, the equipment inside of D111 will be disassembled. The equipment will be surveyed to ensure that it is below the release criteria. Equipment that is found to exceed the release criteria will be further decontaminated and re-surveyed.

The baghouse will be disassembled using a trackhoe with a grapple attachment, cutting torches, chains and heavy equipment, as needed. The baghouse building components shall be taken inside to D111 for surveying. Building structures that are found to exceed the release criteria will be further decontaminated and re-surveyed.

The disassembly of D111 will be conducted using a trackhoe with a grapple attachment and manual disassembly through the use of cutting torches and hand-held saws, as is appropriate and safe.

Large building structures that could not be decontaminated in place shall be moved to a decontamination area for HEPA-vacuuming and further disassembly. Each building structure shall be surveyed and released for unrestricted use or set aside for further decontamination and subsequent surveying.

3.5.5 General Decontamination and Disassembly Procedures

Areas and material that have a surface contamination, or have been decontaminated to below the site-specific release criteria shall be disassembled and removed for unrestricted use. If contamination is suspected to have diffused into porous materials, such as wood, the material shall sampled and sent for off-site analysis.

Decontamination areas shall be constructed inside of Building D102/112 and/or D111 area, unless it is not feasible due to disassembly operations. The internal decontamination area shall minimize dust release to outside areas.

All tools, equipment, and vehicles that enter the work areas shall be appropriately surveyed prior to leaving the work area to determine if decontamination is required.

All building structure material will be surveyed at the ground level when disassembled and before release. This will ensure that no material that exceeds the alpha and gamma site-specific release criteria will be taken off-site.

Materials released as unrestricted, will be stored in an area for ultimate disposal or recycling, depending on the nature of the material. Building materials contaminated above the site-specific release criteria shall be disposed of as low-level radioactive waste in accordance with USNRC regulations.

The only material that will be managed at the SMC facility will be fill slag and soil/dust that exceed the site-specific release criteria. These materials will be put in the Storage Yard. Additional material may be temporarily stored there during the course of the project.

During the disassembly, Transite Panels will be encountered on the roof and sides of Building D102/112 and D111. Summit Compliance has contracted a Licensed Asbestos Abatement Contractor. The EPA-notification, air monitoring, disposal and other aspects of applicable regulations will be coordinated through these two parties.

The former buildings, decontamination and staging areas shall be effectively surveyed pursuant to the MARSSIM guidelines for preparation of the Final Status Survey.

Instrumentation used during the project will be appropriate for the type of radiation expected, of sufficient sensitivity and accuracy to detect the radioactive materials found at the SMC facility, and of sufficient in quantity to support the activities. Calibration documentation and specification for each piece of equipment used will be included in the Final Status Survey Report.

3.6 FINAL STATUS SURVEY OF WORK AREAS

Gamma radiation surveys will be conducted in all areas where work with radioactive material was conducted, including the former buildings areas and the locations used for decontamination. The surveys will be conducted over 100% of the surface to be monitored, by walking over the areas moving a sodium iodide detector in a serpentine pattern with the detector in close proximity to the ground. When elevated activity is detected in a particular location, a count rate shall be obtained in that area. Measured exposure rates will be compared with the release criteria. Any areas exhibiting residual radioactivity above the applicable criterion will be identified with paint and the SMC Radiation Safety Officer (RSO) will be notified. The RSO will make the final determination as to additional remediation in those areas.

Soil samples will be obtained from the immediate proximity of all the work areas during this project. These will be forwarded to an offsite laboratory for radiological analysis by the methodology of gamma spectroscopy. The existing background soil sample data set for SMC, which should include samples from local uncontaminated areas, will be used for comparison.

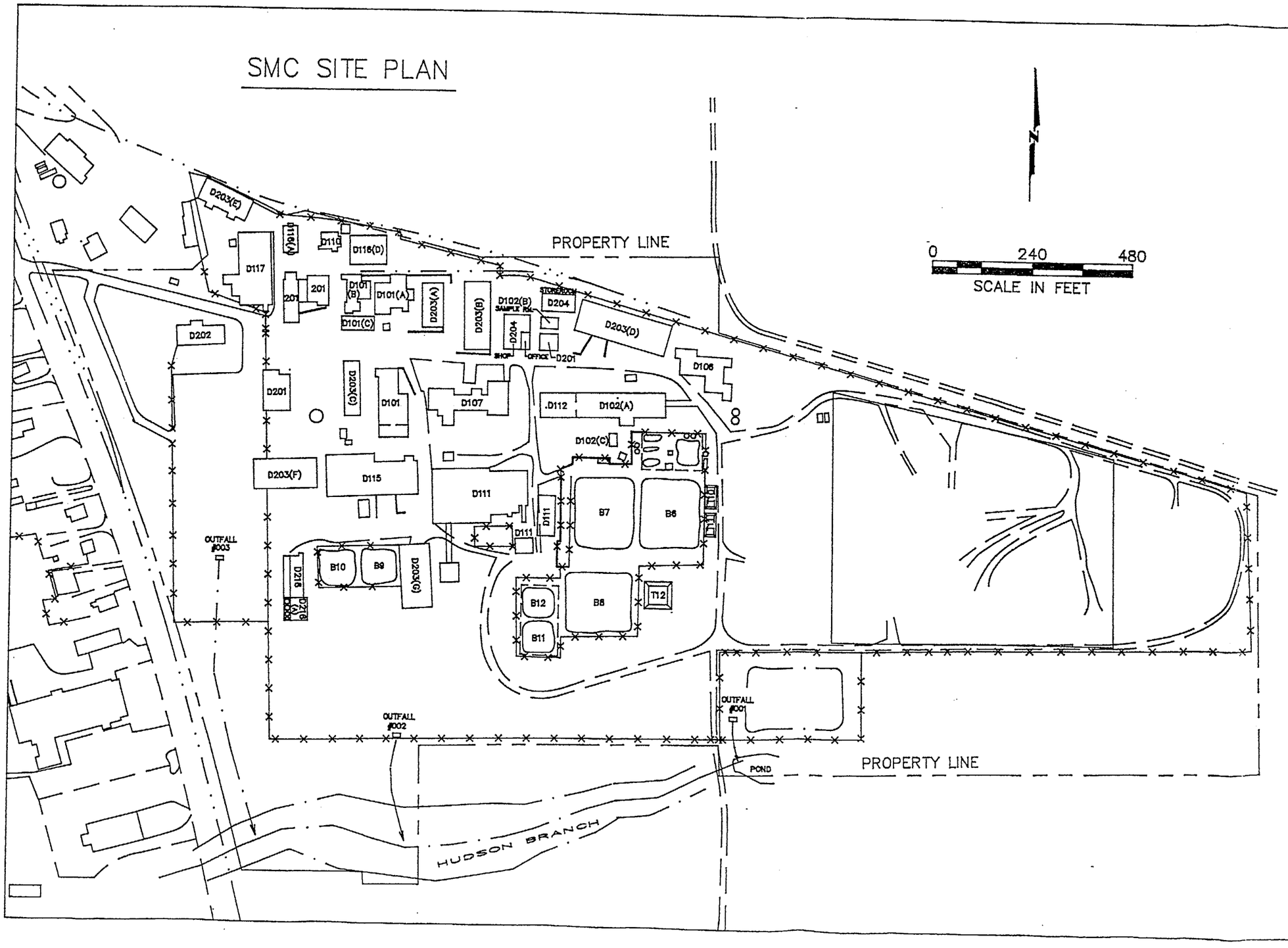
3.7 HEALTH AND SAFETY PROCEDURES

Health and safety provisions have been established to permit the project to be conducted without adverse impacts on worker health and safety. In general, these follow the recommendations in applicable SMC Radiation Safety Procedures. The topics include work area entry, control of work, training, emergency procedures, ALARA, contamination control, protective clothing, personnel monitoring, non-radiological hazards, and lighting considerations. Confined space entries, working at elevated heights, and operation of heavy equipment will be briefly addressed in the PARS Health and Safety Plan, however the field supervisor for Summit Compliance shall be responsible for implementing their own safety procedures for such operations described.

FIGURES

Figure 1: SMC Site Plan
Figure 2: D102 Floor Plan and Historical Surface Contamination
Figure 3a: D111 Office, Break & Storage Room Floor Plan and Historical Surface Contamination
Figure 3b: D111 Upper Level Floor Plan and Historical Surface Contamination
Figure 3c: D111 Lower Level Floor Plan and Historical Surface Contamination
Figure 4: Flex-Kleen Floor Plan and Historical Surface Contamination

SMC SITE PLAN



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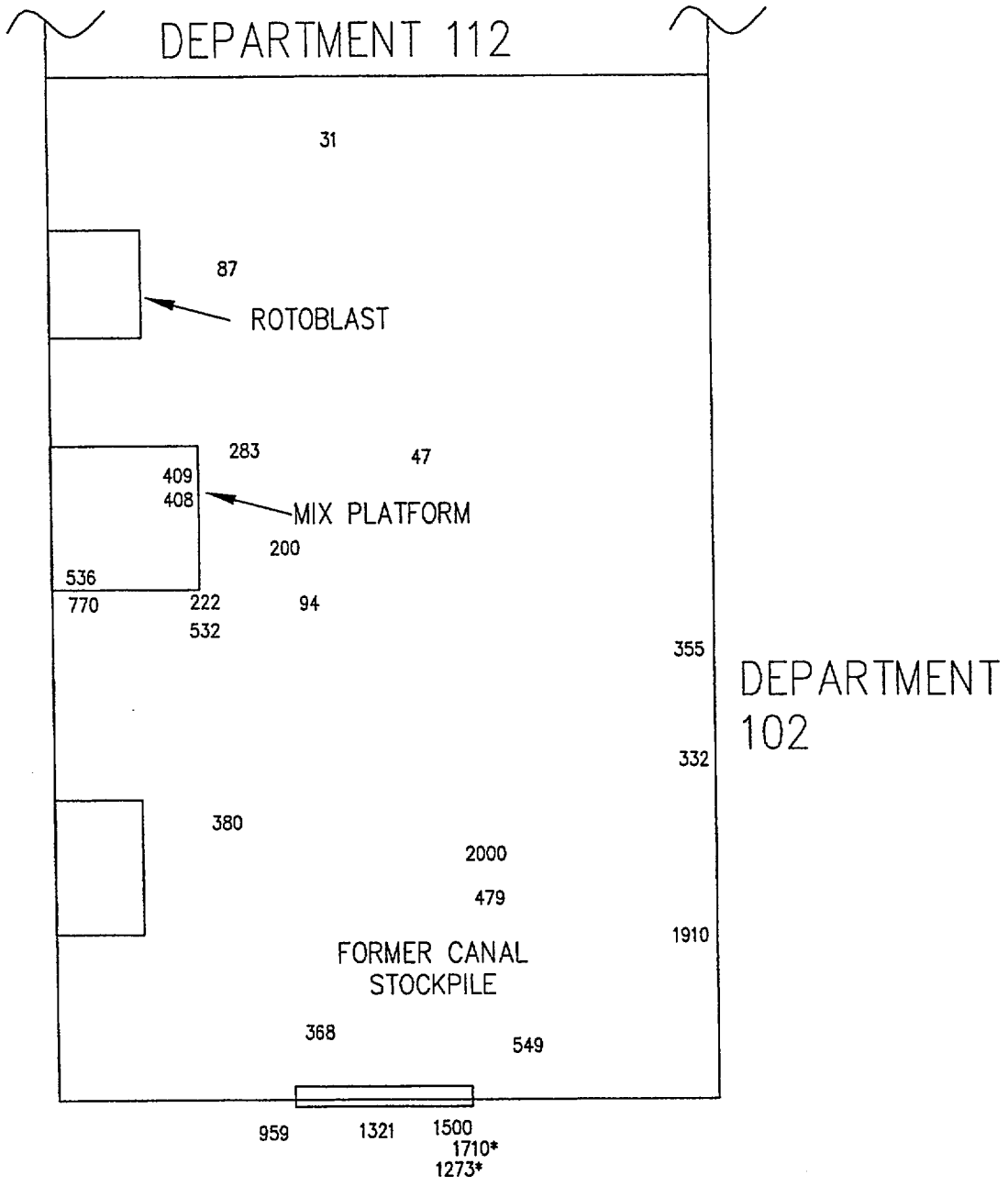


MEASUREMENTS DENOTE TOTAL ALPHA CONTAMINATION IN dpm/100 cm².

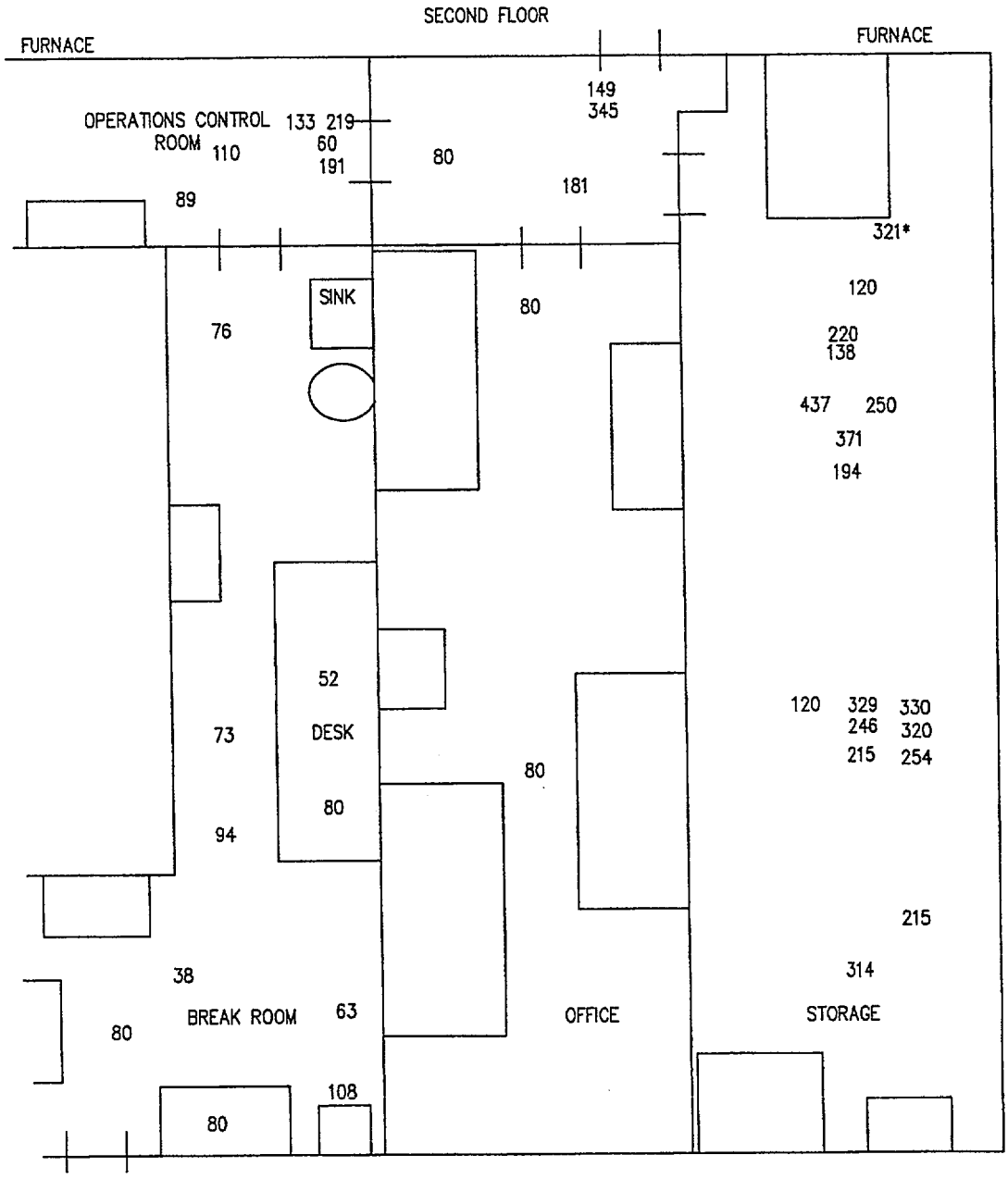
MEASUREMENTS WERE OBTAINED FROM QUARTERLY SURVEY REPORTS FROM 4th QUARTER 1997 THROUGH 2nd QUARTER 2001, CONDUCTED BY IEM.

* MAXIMUM MEASUREMENT(S) FROM 2nd QUARTER 2001 SURVEY REPORT.

FIGURE 2
SHEILDALLOY METALLURGICAL CORPORATION

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: PM	SCALE: NOT TO SCALE	JOB No.: 610-01
CK'D. BY: RJ	DATE: 4/2/02	FILE NO.: 610-01
REV. NO.	REV. DATE:	FIGURE NO.:2



D111 – OFFICE AND BREAK ROOM

MEASUREMENTS DENOTE TOTAL ALPHA CONTAMINATION IN dpm/100 cm².

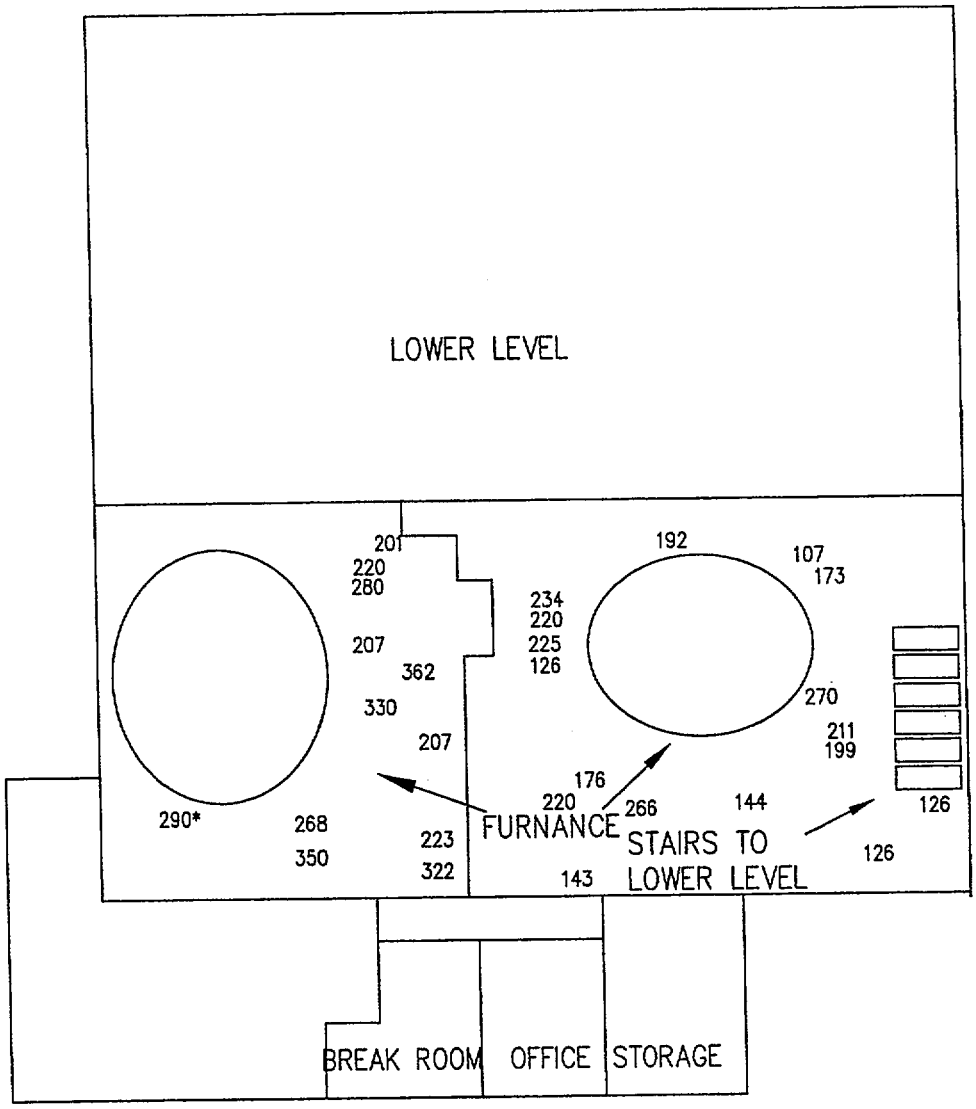
MEASUREMENTS WERE OBTAINED FROM QUARTERLY SURVEY REPORTS FROM 4th QUARTER 1997 THROUGH 2nd QUARTER 2001, CONDUCTED BY IEM.

* MAXIMUM MEASUREMENT(S) FROM 2nd QUARTER 2001 SURVEY REPORT.

FIGURE 3A
SHEILDALLOY METALLURGICAL CORPORATION

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: PM	SCALE: NOT TO SCALE	JOB No.: 586-02
CK'D. BY: RJ	DATE: 4/2/02	FILE NO.: 586-02.dwg
REV. NO.	REV. DATE:	FIGURE NO.:3A



D111 – UPPER LEVEL

MEASUREMENTS DENOTE TOTAL ALPHA CONTAMINATION IN dpm/100 cm².

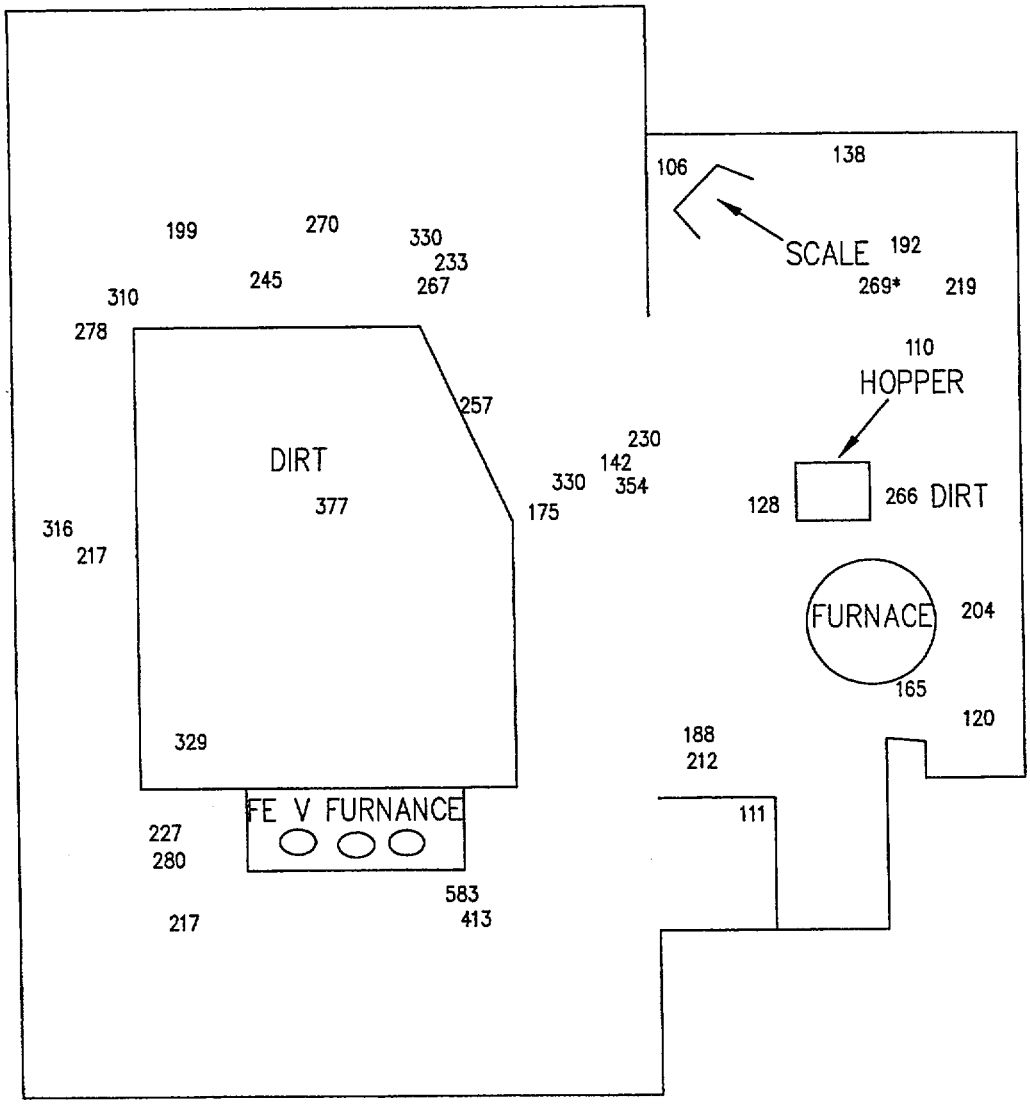
MEASUREMENTS WERE OBTAINED FROM QUARTERLY SURVEY REPORTS FROM 4th QUARTER 1997 THROUGH 2nd QUARTER 2001, CONDUCTED BY IEM.

* MAXIMUM MEASUREMENT(S) FROM 2nd QUARTER 2001 SURVEY REPORT.

FIGURE 3B
SHEILDALLOY METALLURGICAL CORPORATION

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: PM	SCALE: NOT TO SCALE	JOB No.: 610-01
CK'D. BY: RJ	DATE:	FILE NO.: 610-01
REV. NO.	REV. DATE:	FIGURE NO.:3B



D111 – LOWER LEVEL

MEASUREMENTS DENOTE TOTAL ALPHA CONTAMINATION IN dpm/100 cm².

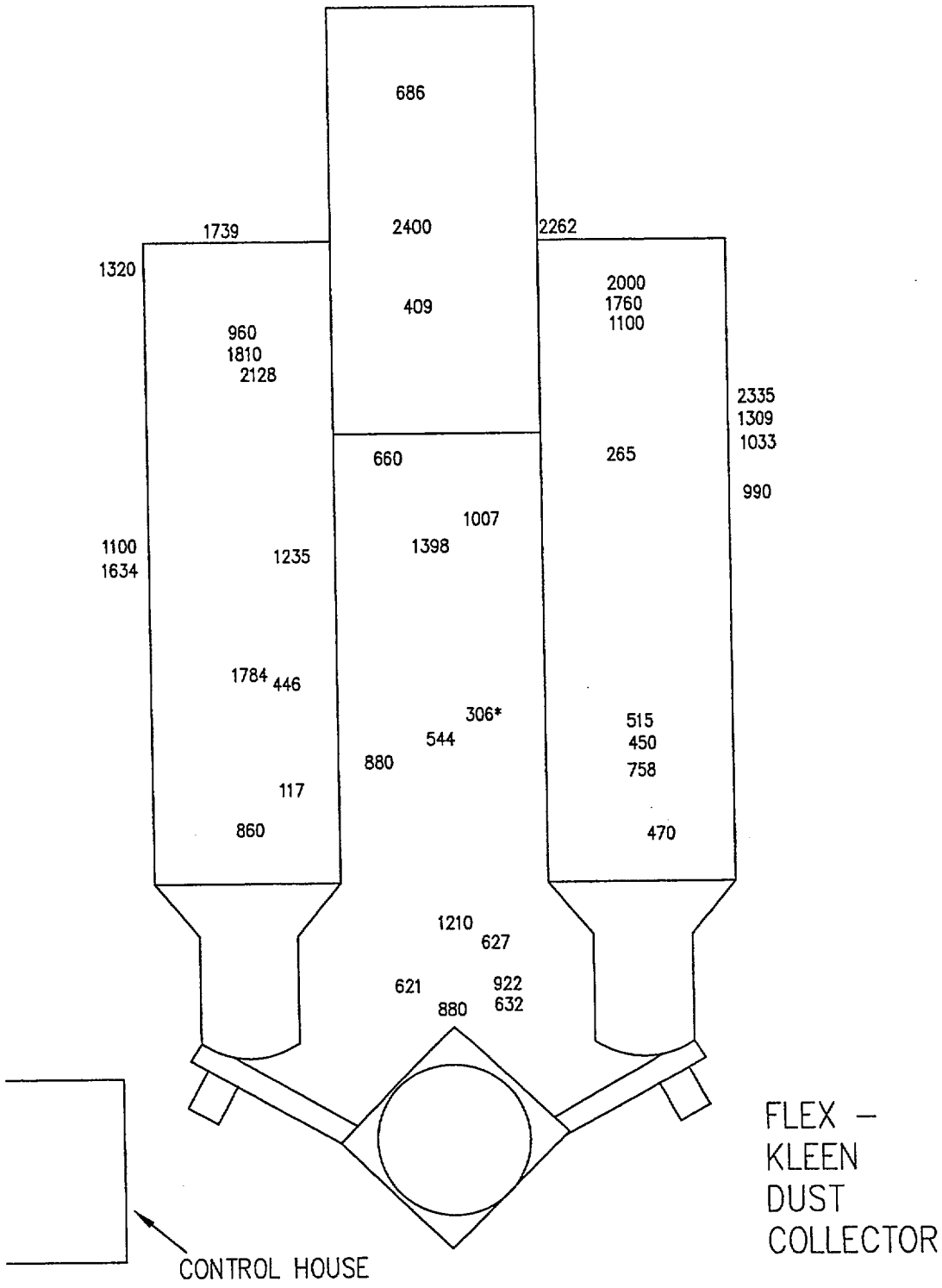
MEASUREMENTS WERE OBTAINED FROM QUARTERLY SURVEY REPORTS FROM 4th QUARTER 1997 THROUGH 2nd QUARTER 2001, CONDUCTED BY IEM.

* MAXIMUM MEASUREMENT(S) FROM 2nd QUARTER 2001 SURVEY REPORT.

FIGURE 3C
SHEILDALLOY METALLURGICAL CORPORATION

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: PM	SCALE: NOT TO SCALE	JOB No.: 586-02
CK'D. BY: JK	DATE: 4/2/02	FILE NO.: 586-02.dwg
REV. NO.	REV. DATE:	FIGURE NO.:3C



MEASUREMENTS DENOTE TOTAL ALPHA CONTAMINATION IN dpm/100 cm².

MEASUREMENTS WERE OBTAINED FROM QUARTERLY SURVEY REPORTS FROM 4th QUARTER 1997 THROUGH 2nd QUARTER 2001, CONDUCTED BY IEM.

* MAXIMUM MEASUREMENT(S) FROM 2nd QUARTER 2001 SURVEY REPORT.

FIGURE 4
SHEILDALLOY METALLURGICAL CORPORATION

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: PM	SCALE: NOT TO SCALE	JOB No.: 610-01
CK'D. BY: RJ	DATE: 4/2/02	FILE NO.: 610-01
REV. NO.	REV. DATE:	FIGURE NO.: 4

TABLES

Table 1 - Site-specific Release Criteria

TYPE	NUCLIDE[1]	REMOVABLE[2,4]	TOTAL[2,3] (FIXED PLUS REMOVABLE)	CONCENTRATION[6,7]
Surface	U-nat, U-235, U-238 and associated decay products	1,000 dpm • /100 cm^2 above background	5,000 dpm • /100 cm^2 above background	--
Surface	Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200 dpm/100 cm^2 above background	1,000 dpm • /100 cm^2 above background	--
Surface	Mixture of U-nat and Th-nat	--	600 dpm • /100 cm^2 by *direct frisk* above background[5]	--
Soil Volume	U-238 and U-234 with progeny in equilibrium	--	--	2.5 pCi/g each above background, averaged over the volume of interest
Soil Volume	Th-232 and Th-228 with progeny in equilibrium	--	--	2.5 pCi/g each above background averaged over the volume of interest
Soil Volume	Mixture of U-nat and Th-nat	--	--	15 microR per hour above background[8]

[1] Where surface contamination by both • and • -gamma-emitting radionuclides exists, the limits established for • and • -gamma-emitting radionuclides should apply independently.

[2] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[3] The levels may be averaged over 1 m^2, provided the maximum surface activity in any area of 100 cm^2 is less than three times the guide values. For purposes of averaging, any square meter of surface shall be considered to be above the activity guide G if: (1) from measurements of a representative number (n) of sections it is determined that 1/n • S_i • G, where S_i is the dis/min-100 cm^2 determined from measurement of section I; or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm^2 area exceeds 3G.

[4] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. (Note - The use of dry material may not be appropriate for tritium.) When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. Except for transuranics and Ra-226, Ra-228, Ac-227, Th-228, Th-230, and Pa-231 • emitters, it is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

[5] Assumes removable activity is the limiting value.

[6] Taken from (reference) BTP.

[7] Concentrations may be averaged over the soil volume of interest as described in (reference) FSTP.

[8] Assumes 2.5 pCi/g each of Th-232, Th-228, U-238, and U-234 (plus progeny in equilibrium) evenly distributed throughout the soil volume to a depth of 15 cm, with measurements made at a height of less than three (3) cm above the soil surface. Taken from (reference) IEM.

Table 2 - Historical Site Assessment Data
Maximum Gamma Survey Readings (microR/hour)

Quarter	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	4th	1st	2nd
Year	1997	1998	1998	1998	1998	1999	1999	1999	1999	2000	2000	2001	2001
Building/Location													
D102	950	500	900	1400	50	1500	1000	70	80	50	40	110	80
D111													
Office and Break Room	10	12	12	11	12	20	15	11	13	11	12	12	15
Storage Area	8	15	11	12	15	13	12	7	8	7	19	16	12
Upper Level	105	600	75	192	80	150	140	90	80	80	170	130	110
Lower Level	900	600	500	475	280	500	480	900	325	300	700	80	180
Flex-Kleen Baghouse	18	15	N/S	15	40	23	10	12	13	15	21	40	20

Table 3 - Historical Site Assessment Data

Maximum Surface Contamination (disintegrations per minute α / 100 square centimeters)

Quarter	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	4th	1st	2nd
Year	1997	1998	1998	1998	1998	1999	1999	1999	1999	2000	2000	2001	2001
Building/Location													
D102	151	549	2000	1500	770	536	222	466	413	1910	1982	1273	1710
D111													
Office and Break Room	225	181	140	89	110	Background	Background	345	133	149	177	60	Background
Storage Area	371	339	320	215	330	326	159	329	194	437	Not Sampled	120	321
Upper Level	277	362	350	268	330	273	223	270	199	266	190	126	290
Lower Level	377	257	310	278	330	252	329	583	413	354	186	142	269
Flex-Kleen Baghouse	2335	2444	2400	1058	1320	1334	1214	880	627	1235	399	306	632

TABLE 4 – Field Instrumentation

INSTRUMENT MODEL	DETECTOR	USE	DETECTION EFFICIENCY	DETECTION SENSITIVITY
Ludlum Model 2221 Scaler/Ratemeter	Ludlum Model 43-1 Scintillator	Contamination surveys (alpha) of surfaces, smears, and air samples	Alpha 60% ^{239}PU	--
Ludlum Model 19 MicroR Meter	1in^2 sodium iodide (NaI)T1 scintillator	Walkover gamma survey	To Be Determined	175 cpm/micror/hr (*137Cs gamma*)
Gil Air 5	--	Low flow air sampling pump	--	--
Gilibrator	--	Flow calibration for Gil Air 5 (<5 lpm)	--	--
High Flow Sampling Pumps	--	High flow air sampling pumps (>5 lpm)	--	--
TLD Dosimeters (supplied by ICN)	--	External radiation dose	--	--

APPENDICES

Appendix A: PARS Project Team Description

Ravi Jarecha, C.E.T.(Project Director)

Ravi Jarecha, CET is the Director of Health & Safety Division at PARS Environmental, Inc. and is responsible for all day-to-day project activities, including the supervision of PARS field project personnel, for all Health & Safety projects. He is also responsible for coordinating all project activities, and he involves PARS senior level technical staff when appropriate and required to meet project objectives.

Mr. Jarecha is a graduate of Rutgers University where he majored in Environmental & Occupational Health. He is a Certified Environmental Trainer with over eight years of Health & Safety experience in diverse projects in the environmental field. During his career Mr. Jarecha as had a variety of roles on many environmental projects. His recent experience includes:

- Project Director and Supervising Health & Safety Officer during the environmental investigation conducted at a hazardous waste site that was contaminated with radioactive waste and volatile organic compounds in groundwater, where he also developed and implemented the Health and Safety Plan.

- Project Director of a personal air monitoring project for exposure to site contaminants at a hazardous waste site. The monitoring data was then compared to the OSHA Permissible Exposure Limit to determine if personnel wore adequate personal protective equipment.

- Project Director for air sampling at several asbestos abatement sites during removal and decontamination of asbestos containing building material.

Edward A. Christman, Ph.D., C.H.P. (Health Physics Planning)

Dr. Edward Christman has over 30 years experience in the field of Environmental Health and Safety, with specialized interest in Radiation Protection. He has served as the Assistant Clinical Professor at the Mailman School of Public Health in Columbia University, New York, and has taught a graduate level course in Health Physics offered jointly with the Department of Applied Physics and Applied Mathematics. He has also been an Associate Graduate Faculty Member at the Department of Environmental Sciences in Rutgers University.

Dr. Christman has been certified by the American Board of Health Physics in comprehensive Health Physics since 1983. He graduated with a Masters and a Doctorate in Radiation Science from Rutgers University in 1974 and 1977, respectively. His current specialized areas of expertise include Occupational Health and Safety, Radiation Protection, Radiation Physics and Chemistry, and Medical Physics.

From 1991 to 1999, he served as the Director of the Environmental Health and Safety Office at the Health Sciences Campus at Columbia University, where he initiated the program in the Health Sciences Division, and was responsible for all Environmental and Occupational Health and Safety Programs for the campus. Previously he had served as Associate Director for Program Development in the Department of Radiation and Environmental Health and Safety in Rutgers University, where he initiated and coordinated all Health and Safety programs at the university.

From 1977 to 1989, he was the Supervising Radiologist at the Department of Radiation and Environmental Health and Safety in Rutgers University, where his responsibilities included the supervision of the Radiation Safety Program for the University and Medical School. This included more than 300 radioisotope users, many analytic X-ray units, and other machine sources including a 20 MeV Tandem Van de Graff accelerator.

Dr. Christman has extensive experience in providing Radiation Protection to industry and is active in many professional activities. He is the founding member of the Executive Board at the U.S. EPA Eastern Region Radon Training Center at Rutgers University. He is also a Member of the New Jersey Department of Environmental Protection's (NJDEP) Radium/Radon Advisory Board, as well as being a member of several Health Physics honor societies and related professional organizations.

Robert Confer, C.I.H. (Health Physics Monitoring)

Mr. Robert Confer, CIH has 42 years of experience in the field of Industrial Hygiene, including more than 25 years with Exxon Corporation. While with Exxon Mr. Confer served as a Senior Industrial Hygiene Associate, providing services in the following areas:

- Provided technical support in Environmental and Industrial Hygiene to over 27 foreign and domestic facilities.
- Managed a multi-plant industrial hygiene program at refineries and petrochemicals plants.
- Conducted detailed research on sampling and analytical instrumentation and methods for air sampling for application throughout foreign and domestic facilities.

Mr. Confer has also worked with Westinghouse Electric Company and the Pennsylvania Department of Health. During that time he worked on a variety of industrial hygiene projects, including:

- Developing appropriate health and safety practices for work with enriched uranium fuel.

- Ensuring effective contamination control of radioactive material.
- Evaluating employee exposure to airborne contaminants.
- Designing and evaluating ventilation systems to minimize employee exposure.
- Evaluating personnel exposure to ionizing radiation.

Harch S. Gill, Ph.D. (Remedial Planning)

Dr. Harch Gill is the General Manager of PARS Environmental, Inc. and in that capacity he will be responsible for ensuring that all necessary resources are provided to the project in a timely manner.

Dr. Gill graduated from Cornell University in 1971 with a major in Civil Engineering and a minor in Environmental Engineering. He has worked with the Nuclear Regulatory Commission on several nuclear related projects since 1971. He has been the principal investigator and project manager for Preliminary Safety Analysis Reports (PSAR) and Environmental Reports (ER) for over twenty nuclear plants, primarily in the eastern United States. Clients that he has worked with include:

- Public Service Electric and Gas Company at the Salem and Hope Creek Nuclear Power Generating Stations
- Potomac Electric and Power Company at the Douglas Nuclear Power Generating Station
- Virginia Electric Power Company at the North Anna Nuclear Power Generating Station
- Niagara Mohawk Power company at the Nine-Mile Point Nuclear Power Generating Station
- Baltimore Gas and Electric Company at the Calvert Cliffs Nuclear Power Generating Station

He was the project manager for studies related to the disposal of low-level radioactive wastes for the "Southern Compact", a group of electric utility companies in the South-Eastern United States.

Dr. Gill has participated in the decommissioning of three facilities that were licensed with the United States Nuclear Regulatory Commission (USNRC) as Permanent Restricted Areas. In July 2000, Dr. Gill was part of the team that decommissioned several buildings at the Former Sylvania Products Incorporated facility in Hicksville, New York. The

project was done for GTE Operations Support Incorporated (GTEOSI) in cooperation with New York State Department of Environmental Protection (NYSDEC) and USNRC. The decommissioning scope of work involved the excavation and disposal of over 2000 tons of soils at the site contaminated with low levels of Uranium, Thorium and trichloroethene. All work was performed in full compliance with NRC's Radiation Safety Procedures. The project involved the performance and documentation of a final status survey in accordance with NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM).

Louis J. Apoldo, P.E. (Remedial Engineering/Heavy Construction)

Mr. Apoldo is a PARS Senior Engineer with more than 35 years of consulting engineering experience in the planning and direction of a wide variety of remedial engineering projects involving the application of geotechnical engineering and heavy construction principles. He has a Masters degree in Civil Engineering, is a registered Professional Engineer, and has gained diverse professional experience in leadership roles at several large consulting engineering organizations. During his career, Mr. Apoldo has had key participation in several projects involving radiological and nuclear-related issues, such as:

- Engineering Manager of the Feasibility Analysis, Disposal Method Selection, and Preliminary Design activities for the permanent closure of the NYSERDA low-level radwaste burial trenches at West Valley, NY. This project involved the development of candidate concept designs to contain low-level radwastes that had been historically deposited in uncontrolled burial trenches, and the logical selection of a conceptual engineered structure that could cost-effectively and safely contain these buried radwastes for at least 300 years.

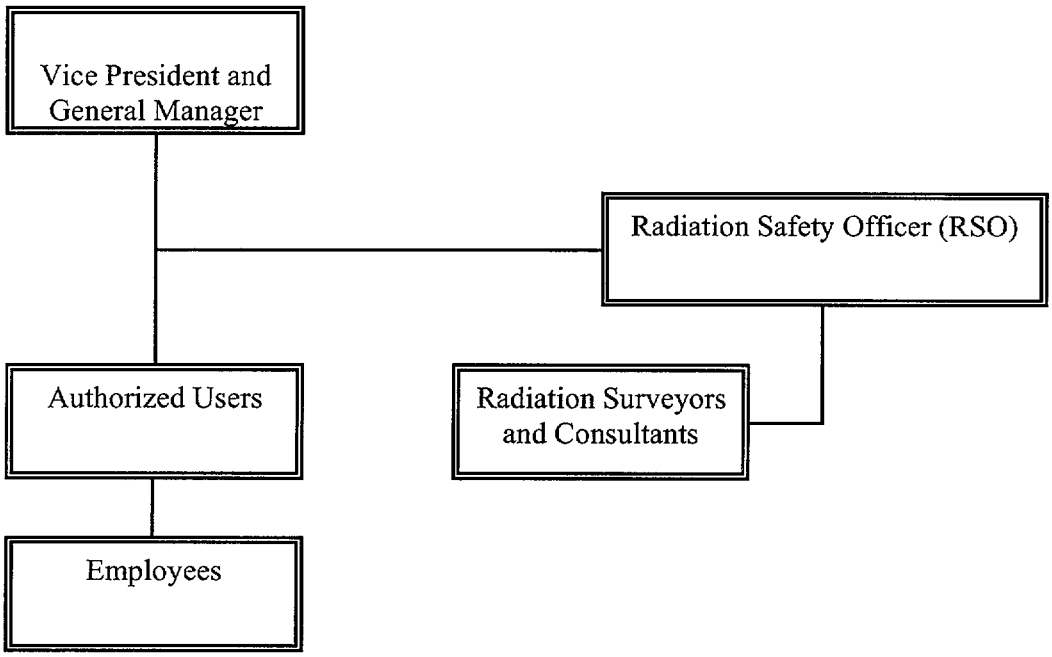
- Project Director for the investigation and remediation of the Sumitomo Machinery Company site in Teterboro, NJ, which contained mixed (chlorinated solvents and radionuclides) waste soil and groundwater contamination issues. To limit the remedial costs for addressing the excavated mixed waste soils, a temporary waste separation process was established onsite which employed a transportable thermal desorption unit to remove the volatile solvent contamination from the mixed waste soils. The remaining radiologically contaminated soils were then surveyed onsite, so that the soils containing significant radionuclide contamination could be containerized and shipped to a commercial low level radwaste disposal facility, while the remaining soils were disposed locally as daily cover at a municipal landfill.

- Engineering Manager of the Siting and Waste Containment Concept Design Studies for the New York State Low Level Radioactive Waste Commission. The engineering tasks included developing the rationale and engineering requirements for developing several concept designs to safely contain the low level radwastes generated in NY for up to 1000 years, and to elicit public comments about these candidate containment concepts.

- Senior Consultant for Underground Engineering serving the US Department of Energy during the Environmental Studies for the Permanent National High Level Radwaste Repository planned for the Yucca Mountain site in Nevada. Mr. Apoldo participated in the planning of a pilot bore into the proposed repository area and in the planning of various geotechnical and geologic tests to be conducted in the host formation.

- Senior Technical Reviewer for geotechnical and foundation studies conducted for the design and construction of several nuclear power plants, including Salem Generating Station, Atlantic Generating Station, and Hope Creek Generating Station for Public Service Electric & Gas in NJ. Mr. Apoldo also monitored the quality of the Class I structural fill to support the cooling water intake structures at the Prairie Island Generating Station in Red Wing, MN, and performed the initial geotechnical site investigations for candidate sites in MD for Baltimore Gas & Electric and in Moscow, OH for Cincinnati Gas & Electric.

Application Item 7
Radiation Safety Organization



DAVID R. SMITH
Radiation Safety Officer and Authorized User

Education

B.S. (Civil Engineering), Villanova University, 1971
Hazardous Waste Operations and Emergency Response Training (29 CFR 1910.120), Naval Facilities Engineering Command, 1986.
Hazardous/Toxic Waste Management, Lion Technology
SMC General Employee Training and Employee Right to Know Training
Radiation Safety Training for Authorized Users of Radioactive Materials, IEM, 1994.
Managing Radiation Protection Programs, IEM, 1996

Registrations/Certifications

New Jersey Department of Environmental Protection, Class N2 Industrial Wastewater Treatment System Operator License

Experience and Background

1988-Present - Shieldalloy Metallurgical Corporation - Has been responsible for overall management and direction of the company's environmental remedial investigations related to past operating practices, as well as its environmental management of current operations to assure compliance with appropriate local, state and Federal laws and regulations. Managed the Newfield NJ RI/FS and RCRA Lagoon closure programs. Supervise and manage the groundwater remediation program, participated in radiological characterization including pressurized ion chamber measurements, gamma scintillation survey and surface soil sample collection at SMC Newfield. Has been a member of the Radiation Safety Committee, supervised and assisted with the management of the TLD program, performed bioassay sampling and air sampling to demonstrate license and regulatory compliance. Has conducted sampling for analysis to update source material inventory. Has been responsible for radiological decontamination efforts performed at the SMC Cambridge facility which excavated and consolidated the mislocated slags from the 16 areas identified by ORAU and development of documents for submission to NRC for the Decontamination and Decommissioning Reports of 1991. Responsible for the SMC coordination of EA/EIS efforts which NRC has been conducting at the Newfield facility as part of the license renewal and evaluation of the decommissioning options available to the company. Responsible for conducting environmental due diligence investigations associated with planned acquisition of property and companies.

1974-1988 - Naval Facilities Engineering Command - As a senior environmental manager was responsible for the management of CERCLA Site Assessments, Remedial Investigation/Feasibility Studies, RCRA Remedial Investigations and UST closures, development and auditing of NPDES programs; air pollution control program, and at various Naval shore facilities within the 24 state region. These programs were implemented and provided to the Commanding Officers of the following major naval shore facilities: NWS Earle, NJ; NAS Glenview, IL; NSB Groton, CT; NUSC London, CT; NTC Great Lakes, IL;

NAEC Lakehurst, NJ; NSGA Winter Harbor, ME; NCU Cutler, ME; NWSC Crane, IN; NAPC Trenton, NJ; NCBC Davisville, RI; and NETC Newport, RI. Responsibilities included coordination with local, state and Federal agencies. Radiological concerns were addressed at several sites, particularly related to groundwater and soil contamination.

1972-1974 - United States Army Environmental Hygiene Agency - Assisted with the planning, management and accomplishment of baseline environmental surveys of US Army munition depots and manufacturing plants. The surveys established the basis for the US Army for applying for their first round of National Pollutant Discharge Elimination System (NPDES) permits. The surveys established sampling points/locations at the depots and munition manufacturing facilities for the collection and characterization of industrial wastewater domestic sewer, and storm water discharges. These sampling locations were sampling over a two to four week period for a comprehensive list of analytes including BOD, COD, bacterial (fecal), chemical composition, metal and organics. The results were compiled into a report submitted to the Commanding Officer of the facility with recommendations for treatment, monitoring, etc.

Application Item 8

Training for Individuals Working in Restricted Areas

All personnel permitted unescorted access to the controlled area receive training in radiation protection. Training may consist of Visitor Training, Hazard Communication Training, General Employee Training (GET), Radiation Worker Training, and/or special briefings, as determined by the RSO. In addition, training programs address the pertinent requirements of 10 CFR 19, 29 CFR 1910, and 40 CFR 68, as applicable and include, as a minimum, the topics listed in Attachment 2 of SMC Radiation Safety Procedure No. RSP-001, "Radiation Protection Program Plan, a copy of which is included herein as Application Item 10.

Application Item 9
Facilities and Equipment

Shieldalloy Metallurgical Corporation (SMC) operates a manufacturing facility in Newfield, New Jersey. This facility manufactured specialty steel and superalloy additives, primary aluminum master alloys, refractory and metal carbides, powdered metals, and optical surfacing products. Raw materials currently used at the facility include aluminum metal, chromium metal, manganese metal, silicon metal, copper metal and various ferro alloys (i.e., ferro boron, ferro molybdenum, etc.).

At one time, SMC produced a metal alloy using a specific source material called pyrochlore. This alloy, called ferro columbium, was produced by conventional electrical or aluminothermic smelting techniques. The pyrochlore contained natural uranium in the form of uranium oxide (U_3O_8) and natural thorium in the form of thorium oxide (ThO_2). Because the concentration of uranium and thorium in pyrochlore exceeded 0.05% by weight, it was considered to be source material. However, less than one (1) percent of the source material in the ore remains in the ferro columbium product. Instead, it remains with the by-products of production.

At one time, licensed radioactive materials were stored in a variety of restricted areas. Over the years, SMC has remediated the majority of those areas and has documented that they may be released for unrestricted use. As of the date of this application, the only remaining restricted areas at the facility are those shown in Attachment 1 of RSP-001, "Radiation Protection Program Plan", included herein as Application Item 9.

Resources for Radiation Protection
SMC is equipped with various types of portable radiation detection and sampling instruments in its active instrumentation inventory. These include breathing zone samplers, stationary air samplers, portable microR meters, ion chambers, gamma scintillation probes, alpha scintillation probes, a variety of geiger-mueller counters, and a zinc sulfide smear counter.

To support the radiation protection program, SMC has entered into contract arrangements with a variety of specialty firms. These firms provide analytical services, instrumentation, dosimetry services, field surveyors, Registered Radiation Protection Technologists, Certified Health Physicists, and a variety of other resources to SMC on an "as-needed" basis. All communications with contract support are directed through and coordinated by the SMC Radiation Safety Officer or Alternate Radiation Safety Officer.

Application Items 10 and 11
Radiation Safety Program Description and Waste Management

NEWFIELD	RADIATION PROTECTION PROGRAM PLAN	Procedure No: RSP-001	Page: 1 of 18
		Revision No. 001	Date: April 26, 2003
		Approved by (Senior Corporate Official):	
		Approved by (RSO):	

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CONTROLLED COPY NO. : _____

1 PURPOSE

The goals of the Shieldalloy Metallurgical Corporation (SMC) policy on radiological protection are to minimize the total risk of harm or injury incurred by employees, contractors, or visitors as a result of work-related activities at sites that are licensed to possess radioactive materials, and to demonstrate compliance with applicable laws and regulations on control of radioactive materials. This Radiation Protection Program Plan (Plan) has been developed to guide generation and implementation of SMC Radiation Safety Procedures as they pertain to licensing and radiation protection issues.

2 SCOPE

The goals of the Shieldalloy Metallurgical Corporation (SMC) policy on radiological protection are to minimize the total risk of harm or injury incurred by employees, contractors, or visitors as a result of work-related activities at sites that are licensed to possess radioactive materials, and to demonstrate compliance with applicable laws and regulations on control of radioactive materials. This Radiation Protection Program Plan (Plan) has been developed to guide generation and implementation of SMC Radiation Safety Procedures as they pertain to licensing and radiation protection issues.

3 REFERENCES

3.1 Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports for Workers; Inspection and Investigations"

3.2 Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation".

3.3 Title 10, Code of Federal Regulations, Part 40, "Domestic Licensing of Source Material".

3.4 Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material".

3.5 Title 10, Code of Federal Regulations, Part 110, "Export and Import of Nuclear Equipment and Material".

3.6 Title 29, Code of Federal Regulations, Part 1910, "Occupational Safety and Health Standards".

3.7 Title 40, Code of Federal Regulations, Part 68, "Chemical Accident Prevention Provisions".

3.8 ANSI N323 - American National Standard Institute, "Radiation Protection Instrumentation Test and Calibration," N323-1978m, 1977.

3.9 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

4 DEFINITIONS

The definition of terms used in this Plan that may not be commonly understood shall be found in RSP-002, "Definitions".

5 PROCEDURE

5.1 Radiation Protection Organization and Administration

5.1.1 Senior Corporate Official

5.1.1.1 Overall control and authority for radiation protection shall rest with the Senior Corporate Official .

5.1.1.2 The responsibility of the Senior Corporate Official includes, but is not limited to, the following:

5.1.1.2.1 Establish SMC policy and prepare/amend this Plan accordingly;

5.1.1.2.2 Assure that SMC radiation protection services are sufficient to meet the requirements of this Plan and USNRC license requirements.

5.1.2 Radiation Safety Officer (RSO)

5.1.2.1 The Senior Corporate Official may designate the authority for implementing the radiation protection program described herein to the RSO.

5.1.2.2 The RSO shall be responsible for recommending the type and quantity of staff and resources necessary for full implementation of the Plan.

5.1.2.3 The RSO shall have the responsibility and authority to terminate any work activities that do or may violate regulatory or SMC requirements for radiological protection.

5.1.2.3.1 Specific work activities shall be permitted to proceed to a safe condition after issuance of the stop-work order.

5.1.2.3.2 Stop-work orders shall be lifted only after the initiating conditions have been alleviated.

5.1.2.4 The minimum qualifications of the RSO shall include the following:

5.1.2.4.1 An Associate's degree (or equivalent)

5.1.2.4.2 Course work and/or have experience with the following:

5.1.2.4.2.1 Principles and practices of radiation protection;

5.1.2.4.2.2 Radioactivity measurements, monitoring techniques, and the use of instruments;

5.1.2.4.2.3 Mathematics and calculations basic to the use and measurement of radioactivity;

5.1.2.4.2.4 Biological effects of radiation;

5.1.2.4.2.5 Safety practices applicable to protection from the radiation, chemical toxicity, and other properties of the radioactive materials in use at SMC facilities;

5.1.2.4.2.6 Conducting radiological surveys and evaluating results;

5.1.2.4.2.7 Evaluating radioactive material processing facilities for proper operations from a radiological safety standpoint; and

5.1.2.4.2.8 Familiarity with applicable USNRC, USEPA, and OSHA regulations, as well as the terms and conditions of any licenses and permits issued to SMC by these agencies.

5.1.3 If the RSO is absent for more than 60 calendar days, a new RSO shall be named and notification of such, including the name, qualifications and authority of the new RSO, shall be submitted to the USNRC.

5.1.4 Authorized Users

5.1.4.1 The RSO may designate authority for implementing certain aspects of the radiation protection program to Authorized Users.

5.1.4.2 The RSO shall verify that Authorized Users have the following minimum qualifications:

5.1.4.2.1 Knowledge of work authorization and Radiation Work Permit (RWP) requirements.

5.1.4.2.2 An understanding of the type, form, and authorized uses of radioactive materials in the restricted areas at the Newfield plant.

5.1.4.2.3 An understanding of the provisions of this Plan.

5.1.4.2.4 Training in the topics shown in Attachment 2, including a passing score on a written examination covering these topics.

5.1.4.3 The responsibilities and authority of Authorized Users may include the following:

5.1.4.3.1 Monitoring and maintaining equipment associated with the use, storage, and disposal of licensed radioactive material under their control.

5.1.4.3.2 Preparing products for shipment;

5.1.4.3.3 Performing product testing;

5.1.4.3.4 Performing research and development with licensed radioactive materials; and

5.1.4.3.5 Ensuring that personnel under their supervision comply with the requirements of this Plan.

5.1.5 Radiation Surveyors

5.1.5.1 The RSO may solicit the assistance of Radiation Surveyors in implementing certain aspects of the radiation protection program.

5.1.5.2 Radiation Surveyors shall have demonstrable course work and/or experience in the following:

5.1.5.2.1 Radiation fundamentals including science/math review; radioactivity; interactions, biological effects quantities and units.

5.1.5.2.2 Measurement methods including survey instruments, external and internal monitoring systems, environmental monitoring systems.

5.1.5.2.3 Operational aspects including protection principles, surveys and inspections, waste management, contamination control, emergencies, protective clothing/equipment use.

5.1.5.2.4 Regulations, standards, guidelines and industry-standard radiation safety procedures

Note: Current (active) registration by the National Registry of Radiation Protection Technologists (NRRPT) may, at the discretion of the RSO, satisfy these requirements.

5.1.5.3 The responsibilities and authority of Radiation Surveyors may include the following:

5.1.5.3.1 Ascertain compliance with rules and regulations, license conditions, and the guidelines approved and specified by the RSO;

5.1.5.3.2 Provide technical support for all aspects of radiation protection, including field operations;

5.1.5.3.3 Monitor and maintain equipment associated with the use, storage, and disposal of radioactive material and radiation-producing machines;

5.1.5.3.4 Provide consultation on all aspects of radiation protection to personnel at all levels of responsibility;

5.1.5.3.5 Administer and coordinate the distribution of internal and external personnel monitoring devices and supplies on an as-needed basis;

5.1.5.3.6 Maintain personnel/area monitoring records, notify personnel and management of exposures approaching maximum permissible limits, recommend appropriate corrective action, and evaluate exposures reported by contract dosimetry services;

5.1.5.3.7 Perform an investigation in cases of apparent overexposure to radiation or radioactive materials;

5.1.5.3.8 Coordinate or conduct training programs and instruction in the acceptable methods for the use of radioactive materials and radiation-producing machines;

5.1.5.3.9 Provide refresher training as appropriate (e.g., changes in procedures, equipment, regulation);

5.1.5.3.10 Monitor the storage of all radioactive materials;

5.1.5.3.11 Monitor the shipping and receiving of all radioactive materials;

5.1.5.3.12 Maintain a radioactive materials inventory to assure continued compliance with the possession limits specified in the USNRC license;

5.1.5.3.13 Coordinate and conduct emergency response activities;

5.1.5.3.14 Perform other monitoring/surveillance tasks as directed by the RSO.

5.1.5.4 The RSO should monitor all work performed by Radiation Surveyors to ensure adequacy and compliance with license requirements.

5.2 Facilities and Equipment

5.2.1 Licensed radioactive materials shall be used/stored in the restricted areas listed in Attachment 1.

5.2.2 Temporary use/storage areas at the Newfield facility may be instituted by the RSO.

5.2.3 Laboratory facilities, remote handling equipment, storage containers, shielding, fume hoods, ventilation systems, barriers, access controls, administrative controls, and other items may be used for controlling exposures from licensed radioactive materials.

5.2.4 In restricted areas, all pertinent general industry regulations in 29 CFR 1910, including those that pertain to chemical and fire safety, and all substantive requirements in 40 CFR 68 shall apply.

5.2.4.1 The amount of non-licensed raw materials used to initiate the aluminothermic process shall be minimized.

5.2.4.2 Hazardous materials storage locations and practices shall be subject to planned and periodic inspection by in-house safety personnel and by state/federal inspectors.

5.3 Training in Radiation Protection

5.3.1 All personnel permitted unescorted access to the controlled area shall receive training in radiation protection.

5.3.2 Training may consist of Visitor Training, Hazard Communication Training, General Employee Training (GET), Radiation Worker Training, and/or special briefings, as determined by the RSO.

5.3.3 Training programs shall address the pertinent requirements of 10 CFR 19, 29 CFR 1910, and 40 CFR 68, as applicable and shall include, as a minimum, the topics shown in Attachment 2.

5.3.4 An understanding of the training topics shall be demonstrated by achieving a passing score on a written examination covering the topics shown in Attachment 2.

5.4 Radiation Exposure Control

5.4.1 Radiation Dose Limits and Goals

5.4.1.1 Internal and external exposure limits for employees, visitors and contractors shall be equivalent to those established by the USNRC in 10 CFR 20.1201.

5.4.1.2 Administrative exposure goals for monitored personnel shall be less than 2500 millirem TEDE.

5.4.1.3 The Senior Corporate Official shall ensure that sufficient trained personnel are available to perform each operation such that administrative exposure goals are not reached.

5.4.1.4 Persons under 18 years of age shall not be permitted access to radiologically-restricted areas at SMC facilities.

5.4.1.5 Exposure limits for the unborn child shall not exceed those established by the USNRC for the entire gestation period.

5.4.1.5.1 Any employee, contractor or visitor that has the potential for occupational exposure shall be informed of the potential effects that may result to an embryo-fetus at low exposure levels.

5.4.1.5.2 Individuals shall be encouraged to notify the RSO regarding "declared" pregnancies.

5.4.1.5.3 An evaluation shall be performed by the RSO to determine the potential for an employee to exceed the regulatory exposure limit during the nine month gestation period.

5.4.1.5.4 If the potential exists or if an employee's request for transfer is approved, the employee shall be transferred to a different job assignment.

5.4.1.5.5 Declared pregnant females with the potential to exceed 50 millirem CEDE during a calendar year shall be monitored for internal and external exposure.

5.4.2 All employees with the potential to exceed 500 millirem deep dose equivalent (H_d) within the calendar year shall be assigned a personnel dosimeter.

5.4.2.1 The personnel dosimetry program shall be accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.4.2.2 A formal investigation shall be performed by the RSO in the event that a personnel dosimeter shows an unexpected exposure or if a personnel dosimeter is lost.

5.4.2.3 A written report shall be submitted to the Senior Corporate Official within ten working days for review and approval of follow-up actions intended to prevent the exposure or loss from re-occurring.

5.4.2.4 Dosimeter deployment durations shall be selected, in conjunction with dosimeter detection capabilities to ensure identification of doses above the applicable limits.

Note: In general, quarterly (every three months) exchanges are typical.

5.4.3 All employees with the potential to exceed 500 millirem CEDE or 5,000 millirem CDE from internal sources within the calendar year shall participate in a routine internal radiation monitoring program.

5.4.3.1 Monitoring methodologies may include, but are not be limited to:

5.4.3.1.1 Breathing zone sampling or

5.4.3.1.2 A combination of indirect bioassay and breathing zone sampling.

5.4.3.2 Special bioassay monitoring may be performed whenever an administrative goal may have been exceeded, a nasal smear reveals the presence of detectable radioactivity, or whenever the RSO deems it appropriate.

5.4.3.3 Personal air monitoring, if used for internal dose assessment, shall include provision for the following:

5.4.3.3.1 Samples taken in a work location occupied by a worker should be drawn from a point or series of points within the breathing zone of that worker.

5.4.3.3.2 The sampling location shall be selected so as to be as close to the breathing zone as is practical without interfering with the work or the worker.

5.4.3.3.3 The sampling methodology shall not fractionate by particle size or in other ways distort the physical and chemical properties of the airborne radioactive constituents.

5.4.3.3.4 Airborne radioactivity shall be collected with an air pump connected to a filter cartridge.

5.4.3.3.5 Filters may be submitted to an analytical laboratory or counted in-house for determination of gross alpha activity.

5.4.3.4 A formal investigation shall be performed by the RSO in the event that any monitoring result is unexpected.

5.4.3.5 A written report shall be submitted to the Senior Corporate Official within ten working days for review and approval of follow-up actions intended to prevent the exposure from re-occurring.

5.4.3.6 For dose assessment purposes, the Annual Limit on Intake (ALI) for ^{232}Th and ^{238}U shall be $4x10^{3}$ pCi and $7x10^{4}$ pCi, respectively.

Note: These values of ALI are based upon a measured particle size of two (2) micrometers (AMAD) in the workplace as described in SMC's response to Confirmatory Action Letter No. 1-95-004, May 14, 1995.

5.5 Control of Work

5.5.1 Routine working conditions at the Newfield facility that may subject an individual to exposures that are less than 100 millirem TEDE per calendar year shall require no specific controls.

5.5.2 Control of work at the Newfield facility that may subject an individual to exposures equal to or greater than 100 millirem TEDE per calendar year shall be accomplished by:

5.5.2.1 Establishing radiological standards and responsibilities.

5.5.2.2 Using operations line management and the RSO to monitor performance of radiological work.

5.5.2.3 Training workers in recognition of radiation hazards and their responsibility to prevent their occurrence.

5.5.2.4 Providing personnel with Radiation Safety Procedures and/or RWPs that include the radiological protection measures and controls necessary for safe completion of the job.

5.5.3 Authorized Users shall not initiate work in areas that may subject members of the general population to exposures equal to or greater than 100 millirem per year TEDE.

5.5.4 An RWP shall be prepared for construction, demolition, maintenance, and repair activities, and all non-routine operations in restricted areas.

5.5.5 Temporary Restricted Areas

5.5.5.1 An RWP shall be prepared for work in all temporary restricted areas.

5.5.5.2 The RSO shall terminate (remove) the RWP and other restrictions from the area after:

5.5.5.2.1 Confirming that the work performed under the RWP is complete.

5.5.5.2.2 Confirming that all licensable radioactive materials and contaminated equipment/supplies have been removed.

5.5.5.2.3 Performing and documenting an ambient and contamination survey of equipment and surfaces that came in contact with the radioactive material to ensure they meet applicable criteria for release.

5.6 ALARA Program

5.6.1 While occupational radiation exposures incurred by employees or visitors of SMC historically are low, all exposures shall be assumed to entail some risk to the employee.

5.6.2 Line management shall adopt the following three principles to govern all work activities with the potential for exposure to radiation or radioactive materials:

5.6.2.1 Activities and operations shall produce a positive net benefit.

5.6.2.2 All radiation exposures shall be kept as low as reasonable achievable (ALARA) in light of economic and societal costs.

5.6.2.3 Radiation exposures received by individuals shall not exceed the radiation dose limits described in 10 CFR 20.1201.

5.6.3 ALARA activities shall include the following:

5.6.3.1 A corporate program shall be established that integrates management philosophy and regulatory requirements, with specific goals and objectives for implementation included.

5.6.3.2 The RSO shall establish applicable and appropriate radiological goals to direct all levels of management and workers at SMC toward improvement in radiological performance.

5.6.3.3 ALARA goals shall be reviewed and approved on a planned and periodic basis.

5.7 Contamination Control

5.7.1 Loose and fixed radioactive contamination shall be maintained at concentrations that are as low as reasonably achievable (ALARA).

5.7.2 Equipment, components or surfaces where loose contamination in excess of the following is detected shall be classified as contaminated:

5.7.2.1 1,000 dpm (alpha) per 100 cm^2 for natural uranium

5.7.2.2 200 dpm (alpha) per 100 cm^2 for natural thorium

5.7.3 Equipment, components or surfaces where total (loose plus fixed) contamination in excess of the following is detected shall be classified as contaminated:

5.7.3.1 5,000 dpm (alpha) per 100 cm^2 for natural uranium

5.7.3.2 1,000 dpm (alpha) per 100 cm^2 for natural thorium

5.7.4 Contaminated areas shall be clearly defined and posted.

5.8 Instrumentation

5.8.1 Instrumentation used by the RSO, Radiation Surveyors, Authorized Users, and other employees, visitors or contractors shall be:

5.8.1.1 Of sufficient sensitivity and accuracy to assess radiation exposure levels found at SMC facilities.

Note: These instruments should provide a response in units of microR per hour, milliR per hour, microrem per hour, millirem per hour, or in other units of exposure rate.

5.8.1.2 Able to detect the presence of radioactivity on tools, equipment, clothing, and personnel at all levels found at SMC facilities.

Note: These instruments should provide a response in units of counts per minute, counts per second, disintegrations per minute, disintegrations per second, or other units of radioactivity.

5.8.1.3 Of sufficient quantity to support on-going or planned operations.

5.8.2 Instrumentation shall be purchased, tested and calibrated by methods that are consistent with ANSI N323 recommendations.

5.8.3 Calibration frequencies for instruments in the active inventory shall be at least once per year or more frequently if so recommended by the instrument vendor.

5.9 Surveillance

5.9.1 Routine exposure rate surveys, contamination surveys, air monitoring, and other surveillance activities in restricted areas and certain unrestricted areas, as applicable, shall be performed and documented at least once per calendar quarter.

5.9.2 Non-routine surveys may be performed at the discretion of the RSO or any time there is reason to suspect that radiation or contamination levels may have changed unexpectedly.

5.10 Posting

Posting/labeling requirements shall be as described in 10 CFR 20, Subpart J and 10 CFR 19.11.

5.11 Receipt and Control of Radioactive Material

5.11.1 Incoming packages, known or suspected to contain radioactivity at levels significantly higher than background, shall be monitored for exposure rate and removable external contamination, pursuant to 10 CFR 20.1906.

5.11.2 Radioactive material shall be marked as such to ensure proper handling and storage.

Note: Markings may include tags or stickers indicating "Radioactive Materials".

5.11.3 Items identified as radioactive materials shall be maintained in a radioactive material storage area established for this purpose within a restricted area.

5.11.4 Radioactive material received by SMC shall be entered in a radioactive material inventory log.

5.11.4.1 The log shall be maintained to assure compliance with maximum possession limits established in the USNRC license.

5.11.4.2 The source material inventory shall be updated at least once per calendar quarter to reflect new acquisitions.

5.12 Packaging and Transportation of Radioactive Materials

5.12.1 Licensed radioactive material shipped from SMC shall be packaged, surveyed, labeled, and shipped in accordance with 10 CFR 71.

5.12.2 Prior to shipment of specifically-licensed materials, the RSO shall obtain confirmation that the receiver is licensed to receive the type, quantity and form of radioactive material present in the shipment.

5.12.3 Material shipments to non-domestic (foreign) locations shall be in accordance with 10 CFR 110.

5.12.4 Radioactive material shipped by SMC shall be entered in a radioactive material inventory log.

5.12.4.1 The log shall be maintained to assure compliance with maximum possession limits established in the USNRC license.

5.12.4.2 The source material inventory shall be updated at least once per calendar quarter to reflect usage.

5.13 Control of Radioactive Waste

5.13.1 Control of radioactive waste materials shall be accomplished by the following:

5.13.1.1 Preventing materials from becoming unnecessarily and/or excessively contaminated;

5.13.1.2 Decontaminating and reusing radioactive materials such as tools and equipment;

5.13.1.3 Monitoring materials for radioactivity and removing non-radioactive materials prior to disposal; and

5.13.1.4 Using waste volume reduction techniques when practical.

5.13.2 Radioactive waste may be stored on site or disposed of by one of the following means:

5.13.2.1 Transfer to an authorized recipient as provided in 10 CFR 20.2001;

5.13.2.2 Release into the sanitary sewer in conformance with USNRC 10 CFR 20.2003; or

5.13.2.3 Any other means specifically approved in advance by the USNRC.

5.13.3 Manifests, Certificates of Disposal or other documentation to confirm transfer/disposal shall be maintained by the RSO.

5.14 Radiation Protection Records

5.14.1 The RSO shall maintain records sufficient to document implementation of this Plan and to demonstrate compliance with applicable USNRC license requirements.

5.14.2 The following records shall be preserved and maintained until license termination, at which time the records shall be transferred to the USNRC:

5.14.2.1 Individual employee records and analyses performed using employee exposure records.

5.14.2.2 Records of dose to members of the general public.

5.14.2.3 Records of waste disposal.

5.15 Documentation

5.15.1 Radiation Safety Procedures (RSPs) shall be generated to guide the implementation of this Plan.

5.15.2 The preparation, distribution and use of RSPs shall be controlled.

5.15.3 All Radiation Safety Procedures shall be signed by the Senior Corporate Official, and the RSO prior to implementation.

5.15.4 Approval signatures shall signify the RSP is adequate for its intended use, that it meets the requirements of this Plan, and that all provisions of License No. SMB-743 are met.

5.15.5 RSPs shall be reviewed by the RSO for continued applicability, effectiveness and compliance with this Plan at least once per year.

5.16 Emergency Response and Notifications

5.16.1 For emergencies where radioactive materials may be involved, consideration shall be given to exposure to radioactive materials and ionizing radiation in addition to the other hazards present.

5.16.2 If it is known or suspected that an internal or external dose limit has been exceeded or that contamination levels are not as expected:

5.16.2.1 The RSO shall be notified immediately.

5.16.2.2 The RSO shall evaluate the likelihood and magnitude of the exposure or contamination status, and shall implement appropriate follow-up actions as soon as possible after notification.

5.16.3 The RSO and the Senior Corporate Official shall notify the USNRC of events as required in 10 CFR 20 Subpart M and 10 CFR 40.60.

5.17 Quality Assurance in Radiological Protection

5.17.1 All activities conducted as part of this Plan shall be subject to quality assurance and review as required in 10 CFR 20.1101.

5.17.2 Radiation Safety Procedures shall be developed to implement this Plan.

5.17.3 Limited-scope audits/assessments of the radiation protection program should be conducted by the RSO (or designee) to determine compliance with applicable federal/state regulations, applicable license requirements, and this Plan.

5.17.4 The following programmatic elements shall be audited for compliance and continued applicability at a frequency of at least once per year:

5.17.4.1 Radiation safety training

5.17.4.2 Training of radiation protection personnel

5.17.4.3 Documentation and records

5.17.4.4 Exposure control

5.17.4.5 Instrumentation and surveillance

5.17.4.6 Control of work

5.17.4.7 Waste management/disposal

5.17.4.8 Contamination control

5.17.4.9 ALARA

6 EXEMPTION PROVISIONS

Variances and exceptions to the requirements of this Plan shall be permitted pursuant to the written authorization of the RSO and the Senior Corporate Official, and after approval by the USNRC.

7 DOCUMENTATION

None

8 ATTACHMENTS

8.1 Attachment 1 - Locations Where Licensed Materials are Used/Stored at the Newfield Facility.

8.2 Attachment 2 - Training Topics

ATTACHMENT 1
LOCATIONS WHERE LICENSED MATERIALS ARE
USED/STORED AT THE NEWFIELD FACILITY
"PERMANENT RESTRICTED AREAS"

Building No.	Type	Description
D111	Production Department	Predominant location where source material was used for production purposes. D111 was a 1,742 m^2 by 12 m tall building constructed of wood and metal, and equipped with an operator control room, mechanical booms and heavy equipment handlers, storage containers, scales, a variety of melting pots, two furnaces, a dust collection system, and other miscellaneous items. As of the date of this application, the building and its ancillary areas, including the D111 FlexKleen baghouse, have been demolished, the structural surfaces and all equipment have been decontaminated and released, and the footprint is awaiting performance of a final status survey.
D111-AAF	Former Bag House Location	Concrete slab. Prior to May, 1999, the slab held a bag house and air cleaning system. At this time, only the concrete slab remains.
D102	Production Department	Housed the aluminothermic reduction operation, and was equipped with a furnace, crushing equipment, scales, bagging equipment, and other miscellaneous items. As of the date of this application, the building has been demolished, the structural surfaces and equipment have been decontaminated and released, and the footprint is awaiting performance of a final status survey.
D112	Production Department	Contained within same structure as D102, but did not process source material. As of the date of this application, the building has been demolished, the structural surfaces and equipment have been decontaminated and released, and the footprint is awaiting performance of a final status survey.
Storage Yard	Storage	Area where ferrocolumbium standard slag, ferrocolumbium high-ratio slag, and columbium nickel slag generated from the D111 and D102 smelting operations, baghouse dust, and other source material are stored.

ATTACHMENT 2
TRAINING TOPICS

General Employee Training
1. The type and form of radioactive material present at the facility.
2. The location of USNRC and SMC radiation protection policies and procedures.
3. Employee and management responsibilities for radiation safety.
4. Identification of radiation postings and barriers.
5. Emergency procedures.
6. How to contact radiation safety staff.

Visitor Training and Hazard Communication Training
1. Identification of radiation postings and barriers.
2. How to contact radiation safety staff.

Radiation Worker Training
1. Radioactivity and radioactive decay.
2. Characteristics of ionizing radiation.
3. Man-made radiation sources.
4. Acute effects of exposure to radiation.
5. Risks associated with occupational radiation exposures.
6. Special considerations in the exposure of women of reproductive age.
7. Dose-equivalent limits.
8. Modes of exposure - internal and external.
9. Dose-equivalent determinations.
10. Basic protective measures - time, distance, shielding.
11. Specific procedures for maintaining exposures as low as reasonably achievable.
12. Radiation survey instrumentation - calibration, use and limitations.
13. Radiation monitoring programs and procedures.
14. Contamination control, including protective clothing, equipment and work place design.
15. Personnel decontamination.
16. Emergency procedures.
17. Warning signs, labels, and alarms.
18. Responsibilities of employees and management.
19. How to contact radiation safety staff.

Authorized User Training
1. Review of basic radiation principles
2. Licensing overview
3. Review of measurement instruments
4. Safe handling procedures
5. SMC documentation requirements
6. Emergency Procedures