NRC FORM 374
(7-94)

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Amendment No. 04

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Ronson Metals Corporation	In accordance with the letter dated January 4, 1995, 3. License Number STB-1451 is amended in its entirety to read as follows:
2. Corporate Park III Campus Drive P.O. Box 6707 Somerset, New Jersey 08875	4. Expiration Date April 30, 2002
	5. Docket or Reference No. 040-08843

6. Byproduct, Source, and/or Special Nuclear Material	7. Chemical and/or Physical Form	8. Maximum Amount that Licensee May Possess at Any One Time Under This License
A. Thorium (Natural)	A. Any	A. 75 kilograms

9. Authorized use

A. Decontamination and decommissioning of facilities; packaging of stock material and radioactive waste; storage of radioactive material and packaged radioactive waste prior to shipment.

CONDITIONS

10. Licensed material may be used only at the licensee's facility at 55 Manufacturers Place, Newark, New Jersey.

11. Licensed material shall be used by, or under the supervision of Dwaine Brown.

12. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.

A. Letter dated November 6, 1996 with attachments
B. Letter dated December 16, 1996
C. Letter received March 28, 1997 with attachments

For the U.S. Nuclear Regulatory Commission

Date APR 25 1997

By Original Signed By:
Steve W. Shaffer
Nuclear Materials Safety Branch
Region I
King of Prussia, Pennsylvania 19406

DCOPY

NL 10

APR 25 1997

License No. STB-1451
Docket No. 040-08843
Control No. 121068

Daryl Holcomb, Chief Financial Officer
Ronson Metals Corporation
Corporate Park III - Campus Drive
P.O. Box 6707
Somerset, New Jersey 08875-6707

Dear Mr. Holcomb:

This refers to your license renewal request. Enclosed with this letter is the renewed license. This licensing action has changed your authorization to allow the decommissioning of Building 7 and areas E & F. At the point you wish to decommission other areas or buildings, you are required to submit a decommissioning plan to amend your license to authorize those activities.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Until your license is terminated, you must conduct your program involving byproduct materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.

2. Notify NRC, in writing, within 30 days:

   a. when the authorized user permanently discontinues performance of duties under the license or has a name change; or

   b. when the mailing address on the license changes (no fee is required if the location of byproduct material remains the same).

OFFICIAL RECORD COPY

3. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license when you decide to terminate all activities involving materials authorized under the license.

4. Request and obtain a license amendment before you:

   a. change the authorized user;

   b. add or change the areas of use, or address or addresses of use identified in the license application or on the license; or

   c. change ownership of your organization.

5. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or a certifying official of the licensee rather an authorized user or a consultant.

You will be periodically inspected by the NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in the "General Statement of Policy and Procedure for NRC Enforcement Actions," (Enforcement Policy), NUREG 1600.

Since serious consequences to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Thank you for your cooperation.

Sincerely,

ORIGINAL SIGNED BY:

Ronald R. Bellamy, Ph.D., Chief
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety

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License No. STB-1451
Docket No. 040-08843
Control No. 121068

Enclosures:
1. Amendment No. 04
2. 10 CFR Parts 2, 19, 20, 40, and 71
3. NRC Forms 3 and 313

DOCUMENT NAME: C:\TYPING\ORNL\RONSON\COVER.LIC
To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy

OFFICE	DNMS/RI	N	DNMS/RI					
NAME	Shaffer		Bellamy					
DATE	04/07/97		04/7 /97		04/ /97		04/ /97	

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(908) 234-9319

FAX (908) 234-2956

MS 16
J5

EDWARD E. DAVID, INC.
P.O. BOX 435
1250 LAMINGTON ROAD
BEDMINSTER, NEW JERSEY 07921

EDWARD E. DAVID, JR.
PRESIDENT

Mr. Steve Shaffer
Health Physicist
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Subject: Response to NRC Region 1 Comments
Building #7 Decommissioning Plan
Prometcor (Ronson Metals Corporation)

Dear Mr. Shaffer:

Brown & Root Environmental (BRE) has prepared the following response to NRC comments we received February 6, 1997 regarding the Decommissioning Plan for Building #7, Area E, and Area F at the Prometcor property located at 55 Manufacturer's Place in Newark, New Jersey.

1. *Item 1 paragraph 2 of your response references certain safety related procedures. These procedures must be provided.*

BRE Procedures for personal air sampling, area air sampling, and the performance of radiation and contamination surveys are available for use by field personnel and are attached for information purposes. Any modifications suggested, accepted, and approved would be appended to the Final Radiation Survey Plan or Site Specific Health and Safety Plan which are also attached as requested.

These BRE procedures are:

RAD-001, "Radiation and Contamination Surveys"
RAD-002, "Contamination Surveys"
RAD-003, "Air Sampling"

2. *Item 2 discusses the use of air monitoring equipment. Please provide a specific commitment as to when air sampling shall be performed, when it will be analyzed, and the concentration levels that will trigger procedural changes and/or investigations.*

The site activities requiring either area or personal air sampling are defined in the Site Specific Health and Safety Plan which divides the project into tasks and evaluates hazards associated with each task. The Site Specific Health and Safety Plan is attached.

3. *Please note that the methodology outlined in Item 4 of your response will suffice for field characterization during decommissioning work. An radioisotopic analysis shall be required for your final site status survey.*

The current plan for radioisotope remediation of Building #7 and Area E is to remove materials down to less than 5 pCi/g. Clean-up to this level will preclude conducting isotopic analysis. Because thorium, uranium, and radium isotopes are probably mixed in the concrete floor and soil matrices, establishing clean-up levels for each isotope would require laboratory isotopic analysis. The cost of fast turn-around lab analysis during remedial activities and the potential stand-by time for the subcontractor is high for the relatively small area being remediated. It is more cost effective to establish a gross alpha clean-up level of 5 pCi/g and measure the results on a real time basis with field instrumentation.

4. *Please confirm that the initials of the individual performing the surveys referenced in item 7 of your response shall be added to the survey documentation.*

The referenced procedures require the individual performing the surveys and the supervisor reviewing the surveys to document the performance and review by printing their names and signing the appropriate documents. Individuals will initial and date corrections or other changes to the documentation. For example, each document of results will have a signature page and all sample labels, log sheets, and log book entries will be initialed and dated.

5. *Item 9 appears to be a cursory summary outline of your final site survey plan. No determination of its adequacy can be determined from the information provided. If you wish to have this survey plan approved please submit a detailed survey plan.*

A detailed final site survey plan, site-specific health and safety plan, and copies of the appropriate Brown and Root procedures are attached. The plans are intended for the decommissioning of Building #7, Area E and Area F and do not include the rest of the buildings or property at the Newark facility.

6. *Item 12 discusses the use of a Ludlum Model 2929 for soil sample analyses. This would only be capable of gross counting. This method of analysis will require your cut off concentration to be 5 picocuries per gram, the limit for radium-226, unless a specific area sampling was performed to determine an accurate concentration ratio for all contaminates.*

See the response to Item number 3. The intention is to clean-up the Building #7 floor and Area E to 5 pCi/g and preclude the necessity for isotopic analysis. Based on discussions with NRC

Region 1, the remediation levels for the rest of the buildings and parking lot will be determined separate from Building #7.

The preceding responses and the attachments to this letter were developed based on BRE's experience with radiation surveys and decommissioning projects governed by the NRC. We are prepared to move ahead to complete remediating Bldg. #7 and Areas E and F, pending the NRC's approval of our plan as submitted to you originally on November 1, 1996 and amended on December 16, 1996. The final plan will include the additional responses included in this letter and its attachments.

Sincerely,

Edward E. David Jr.

Edward E. David, Jr.

EED:dw

cc: Mr. Louis V. Aronson, II
Mr. Daryl Holcomb
Jeffrey A. Walder, Esq.

Attachments:
A Final Verification Survey Plan
B Site-Specific Health and Safety Plan
C BRE Procedure 001
D BRE Procedure 002
E BRE Procedure 003
F NRC Telecon Log (12/16/96)
G BRE Initial Response (12/13/96)
H NRC Comment Letter (11/18/96)

Brown and Root Environmental

Site-Specific Health and Safety Plan
for
Ronson Metal Corporation
Building 7, areas E and F
55 Manufacturer's Place
Newark, New Jersey

Task/Site-Specific Health and Safety Plan

TSS HSP Number: MP-003

Project Name:	Ronson Metals Corporation Building 7, Areas E and F Decommissioning Support
Project Number:	GD50
Site Name:	Newark Facility Primary address 55 Manufacturer's Place, Newark, NJ
Site Description:	A single building, Building 7, two unimproved lots, Area E, and Area F.

Proposed Dates of Project:	Beginning Date: TBD	Ending Date: TBD

B & R E Project Manager:	Name: D. Beissel	Signature:	Date:
Task or Site Manager:	Name: D.D. Brown	Signature:	Date:
Author:	Name: D.D. Brown	Signature:	Date:

I have read and approved this Task/Site-Specific Safety Plan (HSP) with respect to present hazards, regulations, requirements, and site procedures.

Project Safety Officer:	Name: D.D. Brown	Signature:	Date:
Industrial Hygienist:	Name: Project Safety Officer	Signature:	Date:
Health Physicist:	Name: Project Safety Officer	Signature:	Date:
Safety & Fire Protection Representative:	Name: Project Safety Officer	Signature:	Date:

DECLARATION OF UNDERSTANDING

Site Health and Safety Plan Acknowledgment

All personnel working onsite must sign this form.

I have read and understand this Health and Safety Plan (HSP), and agree to abide by the procedures and limitations specified here and in the Ronson Metals Corporation Health and Safety Plan.

Name (printed)	Signature	Employer	Employee Number or SSAN	Date
1)				
2)				
3)				
4)				
5)				
6)				
7)				
8)				
9)				
10)				
11)				
12)				
13)				
14)				
15)				
16)				
17)				
18)				
19)				
20)				
21)				
22)				
23)				

Section A General Project Information

Task Objective:	To remove surface contamination from the concrete floor and any affected sumps or floor depressions and drains of Building 7, excavation of contaminated soils from area E. Conduct of final closure radiological surveys and sampling

Project Historical Background Review:	X	Complete		Not Available		Further Study Required	
		Preliminary		Additional Historical Information Attached			

Brief History (if not attached):	The Newark Facility was used to refine rare metals, Cerium refining, Cerium alloy manufacturing, scrap metal processing and the use of thorium for the production of vacuum tube ion scavengers. Building 7 was not used for any process related activities, but was used to store wastes from earlier site remedial actions.
Location/Facility Description:	The facility is located at 55 Manufacture's Place, Newark, N.J. Building 7 was used for storage of contaminated materials prior to shipment off-site, the unimproved lots were not used for any known or identified process activities.
Unusual Features:	None
Topographical Description:	Predominantly flat area organized into a typical commercial facility.

X	Site Map Attached

Project HSP Summary

Level(s) of Protection:		A		B		Modified C	X	C
	X	Modified D	X	D		Sub D		
Overall Hazard Estimate:		High		Moderate		Low		
	X	Very Low		Unknown				
Additional Documentation Attached:		HSP Sections, List:						
		Hazard Description, List:						
		Other:						

Section B Personnel

Task Personnel

Position	Name and Organization	Phone # Radio/Pager	Supervisor	Alternate	Phone # Radio/Pager
Task Leader	T.A. Carlton Brown & Root Env.	(803) 649-7963	D. Brown	None	(803) 649-7963 (803) 441-7266
Team Member	IceSolv				
Team Member	Field Tech				

Key Offsite Personnel

Position	Name and Organization	Phone # Radio/Pager	Supervisor	Alternate	Phone # Radio/Pager
NRC	Steve Shaffer	(215) 337-5000	N/A	N/A	N/A
NJDEP	Jenny Goodman	(609) 984-5498	N/A	N/A	N/A
Project Mgr.	D. Beissel	(301) 258-8736	N/A	N/A	N/A

Section C Site/Material Characteristics

Material/Waste Type(s):	X	Soil			Surface Water		Groundwater			
		Gas	In		Cylinders					
	X	Liquid	In		Drums		Tanks	X	Other	
	X	Sludge	In		Drums		Tanks	X	Other	
	X	Solid	In		Drums		Tanks	X	Other	
Characteristics		Flammable			Combustible		Pyrophoric		Explosive	
		Reactive			Water-Reactive				Oxidizer	
		Corrosive			Toxic		Volatile	X	Radioactive	
Facility:	Type: Industrial				Size: 100,000 ft^2		Terrain: Flat			
	Indoors/Outdoors **(both)**			X	Yes		No			
Prior Site-Related or Public Injuries, Illnesses, or Complaints:	Fire in Building which could have resulted in contamination of vertical and ceiling surfaces.									
Confined Spaces (Describe):	NONE									
		Confined-Space Evaluation Form Completed			Permit Required		Additional Information Attached			
Handling Methods for Waste Generated by Task:	All investigative derived waste (including low-level radioactive waste) that can not be free released will be collected in DOT 17H certified drums and stored on-site in a posted radioactive material storage area. Non-contaminated wastes will be disposed of in the local dumpster.									

Section D Tasks

List of Individual Tasks in This HSP

Task Name	Description
Mobilization and site preparation	Staging materials and equipment in support of abrasive blasting of contaminated concrete surfaces in Building 7. This includes the placement of area air sampling equipment and the establishment of access/egress points for the area under remediation.
Abrasive blasting	Removal of surface bonded contaminants from the concrete floor of Building 7
Excavation of concrete slab	Physical removal of contaminated concrete floor areas which cannot be decontaminated by abrasive blasting.
Packaging of contaminated materials	Packaging contaminated materials either removed by abrasive blasting, physical removal of concrete floor surfaces, and excavated soils in 55 gallon drums and staging these drums for offsite shipment
Field sampling	Collection and analysis of surface and soil samples for verification of remedial action efficiencies, surveys of packaged radioactive materials, and final release of facility and property
Routine radiological surveys	Performance of routine area radiation, airborne radioactivity, and surface contamination surveys in support of remedial actions and personnel protection.
Job-specific radiological surveys	Performance of job or task specific radiation, airborne radioactivity, and surface contamination surveys in support of remedial actions and personnel protection.

N	Job Safety Analysis Attached	N	Safe Work Permit Required
N	Radiation Work Permit Required		

Section E Hazard Analysis and Control

Evaluation of the principal hazards for each site and task identified in the Work Plan. List specific agents and discuss their hazardous properties.

Chemical Substances:	None Identified
Physical Hazards:	The following physical hazards may be present: Physical/safety hazards such as holes/ditches, precariously positioned objects, sharp objects, wet/slippery surfaces, uneven terrain and operating machinery exist on this site. Electrical hazards Noise Heat or Cold stress
Radiological Hazards:	Uranium isotopes and associated progeny Thorium isotopes and associated progeny
Biological Hazards:	Rodents Spiders Insects
Environmental: ("Physical" elements contributing to the potential for accidents)	Rain and electrical storms Icy conditions Snow and sleet Localized flooding

Section E Hazard Analysis and Control (Continued)

Significance of Exposure to Radiation Hazards

Task Name	Non-Ionizing	Ionizing		
		External	Internal	Dermal
Mobilization and site preparation			X	X
Field sampling			X	X
Abrasive blasting			X	X
Excavation of concrete slab			X	X
Packaging of contaminated materials			X	X

Significance of Exposure to Chemical and Biological Hazards

Task Name	Biological Hazards		Chemical Hazards			
	Injection	Contact	Inhalation	Ingestion	Skin	Eye
Mobilization and site preparation	N/A	Y	N/A	N/A	N/A	N/A
Field sampling	N/A	Y	N/A	N/A	N/A	N/A
Abrasive blasting	N/A	N	N/A	N/A	N/A	N/A
Excavation of concrete slab	N/A	N	N/A	N/A	N/A	N/A
Packaging of contaminated materials	N/A	N	N/A	N/A	N/A	N/A

Safety Hazards and Hazard Control

Description	Safety Hazard	Hazard Control
Mobilization and site preparation	Movement of heavy equipment	Use of observers to alert bystanders and equipment operators of potential human or equipment impact
Abrasive blasting	Airborne contamination	Sampling worker breathing zone, implementation of respiratory protection if warranted
	Pressurized air lines	Control of personnel access and equipment movement to preclude damage to pressurized air lines
Excavation of concrete slab	Heavy concrete slab movement	Leather gloves, eye protection, safety shoes
Packaging of contaminated materials	Skin Contamination, eye injury, airborne contamination	Modified level D protective clothing, sampling worker breathing zone, implementation of respiratory protection if warranted.

Hazard Analysis and Control

Task Name	Radiological or Industrial Hygiene Hazard Control Methods
Activities which could result in airborne radioactive contamination	Wetting surfaces, decontamination and containment
Heavy equipment operations, movement of heavy materials	Off vehicle directors for heavy equipment, safety shoes, hard hats and leather gloves

Section F Personal Protective Equipment

Level(s) of Protection:		A		B		Modified C		C
	X	Modified D		D		Sub D		

Specific PPE Descriptions (Indicate Materials–Respirator or Cartridge Type, etc.)

1. Contamination resistant clothing (coverall, with long-sleeved jacket; hooded, disposable contamination-resistant one-piece suit), inner and outer gloves, contamination resistant boot covers, safety boots/shoes, safety glasses, and hard hat.

2. Coveralls, safety boots/shoes, safety glasses, hard hat

3.

4.

PPE Assignments by Task

Task Name	PPE # (a)	Limitations, Upgrade/Downgrade Criteria
Mobilization and site preparation	2	May be modified upon recommendation of field H&S technician and concurrence of Senior Scientist.
Field sampling	1	May be modified upon recommendation of field H&S technician and concurrence of Senior Scientist.

(a) Use # from specific PPE description above or table # from MP HSP.

Section G Temperature Extremes

Task with Special Concerns with Temperature Extremes

Task Name	Description of Concern	Special Precautions
Mobilization and site preparation	Thermal Exposure	Adequate clothing and training to identify symptoms of cold stress
Field sampling	Thermal Exposure	Adequate clothing and training to identify symptoms of cold stress

Section H Training

Special Training Required in Addition to HSP

Task Name	Special Training Required for Task
Mobilization and site preparation	Rad worker and cold stress
Field sampling	Rad worker and cold stress

Section I Medical Surveillance

Medical Surveillance Required in Addition to MP HSP Requirements

Task Name	Unique Medical Surveillance Required
Mobilization and site preparation	None
Field sampling	None

Section J Exposure Monitoring/Sampling

Exposure Monitoring (EM)

	A. Oxygen		B. CGI		C. CO		D. H_2S
	E. PID				F. FID		G. Resp. Dust
	G. Detector Tubes (Specify)						
	H. Heat Stress		I. Noise		SLM		Dosimeter

Exposure Sampling (ES)

	AA. Resp. Silica		BB. Metals		CC. Resp. Dust		DD. Total Dust
X	EE. Other Sampling w/Pump (Specify Parameters) Radiation Particulates - Lapel continuous, Low Volume grab sampling						
	FF. Diffusion Badge (Specify Parameters)						
	Sampling Methods: List Parameters and Methods						
	Sampling Parameters and Methods Attached				Air Sampling Parameters Worksheet Attached		

Action Levels and Required Action for Exposure Monitoring/Sampling

Parameter	Action Level	Action Required
Field Sampling	> 0.1 DAC long-lived activity	Stop work, verify conditions and modify as appropriate

Air Sampling Location and Frequency

Task Name	EM/ES	A or P	Location	Frequency
Field sampling (Lapel Air Sampler)	**ES**	**P**	Workers Breathing Zone	Continuously while work is in progress
Field sampling (Low Volume)	ES	**A**	General work Area	High particulate activity

Section K Site Control

	Specialized Communication Methods Used Besides HASP Specify Method and Purpose: None				
	Location of Site Work Zones, Access Control Points Contamination Reduction Zone, and Command Post Specified on Site Map				
	Additional Safe Work Practices: None				
Yes	Potable Water Required on Site	Yes	Toilet Facilities Required on Site	Yes	Washing Facilities Required on Site
X	Site Entry Procedure: In accordance with Ronson Metal Corporation on-site security Ralph Bucknell (201) 589-1380				
	Work Schedule and Limitations: Work shall be performed between the hours of 07:00 to 17:30 due to security of the facility.				

Section L Decontamination

	Attached Map with CRCs indicated in CRZ
	Specialized PPE Removal and Personnel Decontamination Specify Steps:
	Specialized Equipment Decontamination Specify:

Section M Emergency Response/Contingency Plan

Emergency Actions

Fire: Notify site security 589-1380, Notify Fire Department (911), evacuate the facility and rally at a predetermined rally point as directed by the on-site task manager
Explosion: Notify site security 589-1380, Notify Fire Department (911), evacuate the facility and rally at a predetermined rally point as directed by the on-site task manager
Adverse Weather: Secure work as directed by the on-site task manager
Injury: Notify site security 589-1380, Notify emergency personnel (911), perform necessary first aid response until emergency personnel arrive
Spill: Contain the spill, identify the source of the spill and isolate it. Clean up the spilled material promptly. Survey the area and decontaminate materials as necessary

X	Evacuation Routes Indicated on Site Map
	Route to Hospital Attached to Site Map (Name, Address, and Directions)

Hospital Name, Address, and Directions for Route:

Map Attached

Specialized PPE, Medical Supplies, and Response Equipment Needed for Emergency:

First aid kit

Emergency Phone Numbers

Ambulance	911	Water Company	589-1380
Hospital Emergency Room**Number**		Telephone Company	589-1380
Police	911	Electric Company	589-1380
Fire Department	911	Gas Company	589-1380

See Section B for Company Contacts

Radiation and Contamination Surveys

1.0 PURPOSE

This procedure establishes a consistent method for the performance of radiation and contamination surveys.

2.0 GENERAL

2.1 Definitions

NONE

2.2 References

2.2.1 10 CFR 20, Standards for Protection against Radiation

2.2.2 10 CFR 835, Department of Energy Occupational Radiation Protection

2.2.3 AIK-M4, Site Specific Health and Safety Plan

2.3 Prerequisites, Precautions, and Limitations

2.3.1 Survey all accessible areas according to the Site Specific Health and Safety Plan (HASP). Conduct radiological monitoring of exposure and contamination levels to characterize workplace radiological conditions, to verify the effectiveness of physical design features, engineering and administrative controls, and to identify areas requiring additional controls.

2.3.2 Conduct contamination surveys in areas established for the control of contamination and other areas with the potential for spread of contamination as follows:

- Prior to transfer of equipment and material from one radiological area to another;
- Prior to transfer of equipment and material from highly contaminated areas, unless precautions such as bagging or wrapping are taken prior to transfer (survey the exterior of packaging prior to transfer);
- Daily, at contamination control area control points, change areas, or step-off-pads when in use, or per shift in high use situations;
- Daily, in office spaces located in radiological areas;
- Daily, in lunch rooms or eating areas near radiological areas;
- Weekly, in routinely occupied areas adjacent to radiological areas;
- Weekly, or upon entry if entries are less frequent, in areas where radioactive materials are handled or stored;
- Weekly, or upon entry if entries are less frequent, where contamination boundaries or postings are located;

- During initial entry into known or suspected radiological areas, periodically during work, at the completion of the job, or as specified in the HASP;
- After a leak or spill of radioactive materials.

2.3.3 Use radiation monitoring instruments capable of measuring ambient radiation dose rates for the purpose of controlling radiation exposures. Perform routine radiation surveys in accordance with the following minimum frequencies:

- Daily, in office space located in areas where the potential exists for external radiation exposure;
- Weekly, in routinely occupied radiological areas and Radiation Areas;
- Upon initial entry, weekly during continuing operations, and when levels are expected to change in High Radiation Areas;
- Weekly, for operating HEPA filtered ventilation units;
- Weekly, for temporary Radiation Area boundaries to ensure that radiation areas do not extend beyond posted boundaries;
- Monthly, or upon entry, if entries are less frequent than monthly for areas containing radioactive materials;
- Monthly, for potentially contaminated ducts, piping, and hoses in use outside radiological facilities;
- As required for transient operations by the HASP.

2.3.4 Treat items with inaccessible surfaces that were located in known or suspected removable surface contamination areas and had the potential to become contaminated at levels likely to exceed the surface contamination limits as potentially contaminated and subject to administrative controls unless the items are dismantled and monitored or special survey techniques are used to survey all surfaces.

2.3.5 Use radiation monitoring instruments capable of measuring ambient radiation dose rates for the purpose of controlling radiation exposures.

2.3.6 Use large area wipes to supplement standard smear techniques in areas generally assumed not to be contaminated. If an evaluation indicates that an area wiped is contaminated, a thorough removable contamination survey should be performed.

2.3.7 Perform weekly surveys in areas identified as either contaminated with, or having the potential for being contaminated with, highly radioactive particles ("hot particles"). Survey these areas at least daily during periods of work that may result in the generation of hot particles, such as tape and large area wipes.

3.0 GUIDELINE

3.1 Radiological Measurements

3.1.1 Radiation Exposure Rate Levels

- Performance of radiation surveys should include dose rate measurements of the general area, dose rates at a distance of 30 centimeters from a source or surface of interest to evaluate potential whole body exposures, and dose rates on contact with potential sources of radiation where there is a potential for hands-on work.

- Readings may be recorded on maps or drawings of the facility or area in units of millirem per hour (mR/hr) ensuring that the location of collected data is clearly defined. The definition of data location may be accomplished by the use of a grid coordinate system or relative to an immovable structural member or installed equipment.

NOTE:

Do not use background for a data entry. If the reading are sufficien[illegible]w, enter "< ### (lld for instrument used)" at the data point.

- The minimum number of readings to be taken is predetermined by the Project Safety Officer (PSO) (unless otherwise specified in the HASP). The PSO will review the area survey forms by the end of the next working day.

NOTE:

Survey data that differ from previously collected data in the same area should be closely evaluated to determine the cause of the variance.

3.1.2 Removable Contamination Levels

- Collected smears should represent at least 100 square centimeters (cm^2) of surface area (this is approximately a 4" by 4" square or an 18" long "S"" using the standard 2" disc smear). Smears should be analyzed using the appropriate instruments for both beta-gamma (β-γ) and alpha (α) activity.

- Calculate the results of smears and record as net disintegrations per minute per 100 cm^2, (dpm/100 c^{m2}) above background.

- Identify the location of collected smears on the facility or area map or diagram by using a circled number, numbering the smears in sequential order, (e.g., 1,2,3,. . .,etc.). Annotate smears of horizontal surfaces above floor level by using the circled number and preceding the circled number with the letter "H", (e.g., H1, H2, H3, . . .etc.), and smears of vertical surfaces will be indicated by inserting the letter "V" preceding the circled number.

- The minimum number of smears to be taken is predetermined by the PSO (unless otherwise specified in the HASP). The PSO will review the area contamination survey forms by the end of the next working day.

- Properly contain all smears and large area wipes that are being transported from one radiological area to another.

NOTE:

Do not use "background" for a data entry. If the reading is sufficiently low, enter "< ### (lld for instrument used)", or < (the prescribed limit for the isotope of interest) at the data point.

- Consider the area free of removable contamination if the results from smears are less than the prescribed limits.

- If the results from smears are greater than the prescribed limits for removable surface contamination, inform the PSO and control access to the area.

3.1.3 Large Area Wipes

- Large area wipes should be taken and counted for both beta-gamma (β-γ) and alpha (α) activity with the appropriate portable instrumentation.

- Annotate wipe locations on the survey map or diagram with a circled number preceded by the letter "L". Indicated wipes of horizontal surfaces above the floor level with a the "H" following the letter "L", and vertical surfaces will be designated by inserting the letter "V" following the letter "L"..

NOTE:

Do not use "background" for a data entry. If the reading is sufficiently low, enter "< ### (lld for instrument used)", or < (the prescribed limit for the isotope of interest) at the data point.

- If results indicate a count rate greater than the removable surface contamination limits in a normally contamination free area, notify the PSO and conduct a standard smear survey for removable contamination.

- Contain all smears and large area wipes that are being transported from one radiological area to another.

3.1.4 Direct Beta-Gamma or Alpha Surveys

- Direct beta-gamma and alpha surveys should be taken of all surfaces and objects suspected of or having the potential for being contaminated to verify that there is no "fixed" contamination on the surface or object.

- Those area that indicate contamination above release limits should be clearly identified. brought to the attention of the PSO, and controlled in such a manner that the potential for the spread of contamination is minimized.

- Direct data survey entries should be corrected for instrument efficiency, and adjusted from the area of the probe to 100 cm^2.

- Documentation should also include any removable contamination levels, a description of the affected surface, an estimate of the affected area, and the physical form of the contaminant.

- A sample of the contaminated surface should be collected for subsequent analysis if the physical form permits.

3.2 Equipment and Materials Measurements

3.2.1 Tool survey

- Tools used in radiological areas shall be surveyed for fixed and removable contamination prior to release for use in non-radiological areas.

- Survey data for tools with a surface area of less than 100 cm2 shall be entered on the survey log sheet as dpm/item. Tools with contamination levels (fixed or removable) greater than the prescribed limits for surface contamination shall be controlled as radioactive material. the use of such tools shall be restricted to use in radiological areas only.

3.2.2 Vehicle Surveys

- Survey all vehicles that may come in contact with radioactive materials, including cars, trucks, mobile cranes, mobile trailers, mobile compressors, etc. for contamination prior to release from the radiological area.

- These surveys shall include surveys for both fixed and removable contamination for both beta-gamma and alpha radioactivity.

- Record all survey data on the survey map with a reasonable drawing of the equipment or vehicle.

3.2.3 Vacuum Cleaners

- Perform radiation and contamination surveys on all vacuum cleaners before, periodically during, and after use. In addition to recording the results of this survey on the appropriate survey map, the data obtained should be used to update the data on the Radioactive Material tag attached to the vacuum cleaner.

3.2.4 Temporary Shielding

- Perform radiation surveys for temporary shielding installations, alterations, or removals. Installed temporary shielding should be surveyed during routine area surveys to verify effectiveness and integrity and be documented on the appropriate area survey maps or drawings.

3.3 Recording Survey Results

3.3.1 Include the following on all survey documentation:

- Date, time, and purpose of the survey.

- General and specific location of the survey.

- Name and signature of the surveyor and analyst.
- Pertinent information needed to interpret survey results (i.e., instrument efficiencies, minimum detectable activities, area background radiation levels, instrument background, etc.)
- Reference to the appropriate Health and Safety Plan is the survey is used to support the Plan.
- Field instrument model(s), and serial number(s).
- Results of the measurements of area dose rates.
- Model and serial number of non-portable counting equipment.
- Contamination levels (using appropriate units, pCi/g, dpm/100cm^2, uCi/ml, etc.), and appropriate supporting parameters including: counting efficiencies, counting time, correction factors, type of radiation, and whether the contamination was fixed or removable.
- Locations of areas with levels greater than the prescribed limits.
- Amplifying remarks regarding the ultimate disposition of the area, equipment, facility, etc.

3.3.2 All survey results shall be reviewed by the PSO. The PSO shall sign and date the survey map cover sheet and attached maps indicating acceptance of the content and scope of the survey.

3.3.3 The PSO shall compile and review all survey data with corrective actions when action levels are exceeded.

3.3.4 Ensure the following general actions are taken if abnormal conditions are detected during the conduct of the survey:

- Post the area if necessary, and
- Notify the PSO with the results and copies of the appropriate survey maps.

3.4 Personal Protective Equipment

3.4.1 Personal Protective Equipment (PPE) requirements will be prescribed in the HASP based on the task to be performed, the potential and pathway for personal contamination.

3.4.2 Donning and doffing of PPE shall be performed in accordance with the guidance provided in the Brown and Root Environmental Hypermanual Safety Procedures.

3.4.3 Respiratory protection shall be used and maintained in accordance with Aiken Office procedures for the control, use, and maintenance of respiratory protection devices.

3.5 Records Maintenance

3.5.1 Records generated as a result of implementing this procedures are identified as follows:

- Radiation/Contamination Survey Cover Sheet
- Survey Maps

3.5.2 Prepare, maintain, and document all survey data and supporting records in a clear and legible manner using black or blue ink.

Contamination Surveys

1.0 PURPOSE

The purpose of this procedure is to standardize the technique and methodology for performing and making surface contamination measurements using either direct alpha or beta-gamma count rate meters or soft absorbent material wipes and subsequent analysis using a fixed counting system. This procedure applies to all types of surface contamination measurements. This procedure does not address measuring contamination in soils, on clothing or individuals, or contamination that is uniformly dispersed within a volumetric medium.

2.0 GENERAL

2.1 Definitions

2.1.1 Removable surface contamination - residual radioactive material on a surface as measured by the quantity that can be readily removed by wiping the surface with a soft absorbent material applying moderate pressure.

2.1.2 Fixed surface contamination - residual radioactive material on a surface that cannot be wiped from the surface by wiping the surface with a soft absorbent material applying moderate pressure.

2.1.3 Total surface contamination - residual radioactive material on a surface as measured by obtaining a direct reading with a count rate instrument that includes both fixed and removable contamination.

2.2 References

2.2.1 10 CFR 20, *Standards for Protection against Radiation*

2.2.2 10 CFR 835, *Department of Energy Occupational Radiation Protection*

2.2.3 AIK-M4, *Site Specific Health and Safety Plan*

2.2.4 ANSI N323, *Radiation Protection Instrumentation Test and Calibration*, September 1977

2.2.5 ANSI 13.11, *Control of Radioactive Surface Contamination on Materials, Equipment, and Facilities to Be Released for Uncontrolled Use*

2.2.6 USNRC Regulatory Guide 1.86, *Termination of Operating Licenses for Nuclear Reactors*

2.3 Prerequisites, Precautions, and Limitations

2.3.1 Site or facility contamination guidelines provide contamination limits for releases, classifying areas and classifying items as radioactive material.

2.3.2 Assessing residual contamination on surfaces of materials involves the conduct of fixed point or surface scans with direct reading instruments and wiping surfaces with soft absorbent material while applying moderate pressure and subsequently analyzing the wipe using an appropriate counting system. The limit of detection is dependent upon a number of factors including, but not

limited to, scanning speeds, distance from the probe to the surface of interest, detector efficiency, background radiation levels, and counting times.

2.3.3 Assessments are performed for surface contamination on materials where results provide information for classifying, releasing, or restricting that handling of materials that are likely to or potentially have residual quantities of radioactive material in excess of the quantities prescribed in Table 1.

2.3.4 Where surface contamination by both alpha and beta-gamma emitting nuclides exists, the levels established for the alpha and the beta-gamma apply independently.

2.4 As indicated in Table 1 the total activity levels may be averaged of one square meter provided that the maximum surface contamination in any area of 100 cm^2 is less than three times the values specified. For purposes of averaging, any square meter of surface is considered to be above the contamination limits is:

2.4 1 From measurement of a representative number n of sections it is determined that

$$1/n \sum_n S_i \geq G$$

where S_i is the dpm/100 cm^2 determined from measurement, or

- For fixed point direct measurements or removable measurements, a representative number of locations in a one meter square area should be chosen. the locations should be shown on a map or drawing.
- The sum of the results form these measurement locations, as reported in dpm/100 cm^2, should be divided by the number of locations to determine the average contamination level, and compared to the surface contamination criteria, (i.e., the one square meter average).
- If the average contamination level is greater than the surface contamination criteria, then the item is considered contaminated.

2.4.2 It is determined that the sum of the activity of all isolated spots or particles in any 100 cm^2 area exceeds the criteria.

- For fixed point measurements or removable measurements, all measurements results should be corrected to 100 cm^2.
- If any 100 cm^2 location exceeds three times the average contamination criteria, then the item is considered contaminated.

2.5 Measurements of average radioactive contamination are not averaged over an area of more than one square meter. For objects of less area, the average is derived for each object using the one square meter level as the limit for the total surface area. The maximum contamination level provided in Table 1 apply to an area of not more than 100 cm^2, (i.e., areas larger than 100 cm^2 have to be divided into 100 cm^2 areas with any remaining area contaminant level applied to the 100 cm^2 limit).

3.0 GUIDELINE

3.1 Radiological Measurements

3.1.1 General Requirements

- The complete assessment of a surface includes direct measurements and wipes of removable contamination of representative portions of the surface.

- Direct measuring of a surface for detecting residual contamination is accomplished by making either sequential measurements over the surface with a stationary detector, (i.e., fixed-point measurements) or by slowly sweeping the detector over the surface, (i.e., scanning).

NOTE:

Do not use background for a data entry. If the reading are sufficiently low, enter "< ### (MDA for instrument used)" at the data point, and clearly state the MDA on the survey data sheet.

- Audible indicators of counts (speakers or headphones) should be used for the detection of total activity at the surface. When surface activity is detected, hold the probe stationary for approximately 5 or more seconds for a quantitative measurement.

NOTE:

Survey data that differ from previously collected data in the same area should be closely evaluated to determine the cause of the variance.

- Any type of instrument may be used for either direct or indirect sampling of surface contamination if it is demonstrated that the instrument and sampling methods used will detect and measure surface activity at the criteria specified in Table 1.

- Surveys should be conducted in low background areas (< 300 cpm) whenever possible.

- Instruments shall be checked for proper operation and response prior to use and periodically during use.

3.1.2 Direct Beta-Gamma Measurements

This section describes the necessary requirements for performing direct beta-gamma activity measurements where the beta maximum energy E_{max} is greater than 150 Kev.

- The distance from the detector window to the surface or object being measured should not exceed 0.5 inches.

- The scanning rate for beta-gamma emitters is less than or equal to 2 inches per second.

- Maintain the beta-gamma probe stationary over the surface for approximately 5 seconds if an increased audible count rate is heard or if a quantitative measurement is desired.

- If the beta-gamma background is greater than 300 cpm, shielding of the detector or shielding of the area if practical may be required to allow detection of the activity at the prescribed criteria.

- The Safety Officer will determine the maximum background countrate for direct reading detectors to detect the prescribed criteria for either scanning or fixed point measurements.

NOTE:

Do not use "background" for a data entry. If the reading is sufficiently low, enter "< ### (MDA for instrument used)", or < (the prescribed limit for the isotope of interest) at the data point.

3.1.3 Direct Alpha Measurements

- Since alpha particles have a short range in air, the distance from the detector window to the surface or object being measured should not exceed 0.25 inches.

- The scanning rate for alpha emitters should be less than 0.5 inches per second.

NOTE:

Do not use "background" for a data entry. If the reading is sufficiently low, enter "< ### (MDA for instrument used)", or < (the prescribed limit for the isotope of interest) at the data point.

- Maintain the alpha probe stationary over the surface for approximately 5 seconds if an increased audible count rate is heard or if a quantitative measurement is desired

- The Safety Officer will determine the maximum background countrate for direct reading detectors to detect the prescribed criteria for either scanning or fixed point measurements.

3.1.4 Removable Contamination Measurements

- The amount of removable radioactive material pre 100 cm2 of surface area is determined by wiping an area of approximately 4" X 4" (or an 18" long "S") of the area of interest with a dry filter paper or soft absorbent material while applying moderate pressure and then analyzing the wipe with the appropriate instrument of known efficiency.

    - Surfaces or objects may be wiped approximately 100 % or at locations judged to be worst case (e.g., cracks, seams, inside corners, or other locations where material could accumulate). the surface should be dry, if it is not dry, then the wipes should be dried before counting.

- The amount of radioactive material collected on a wipe is determined with an appropriate instrument of known efficiency, correction for geometry, and type of material for the energy range being monitored.

- When removable radioactive material on objects with a surface area of less than 100 cm2 is determined, the activity per unit area should be based o the actual surface area and the entire surface should be wiped.

3.2 Release Surveys to Controlled and Uncontrolled Areas

3.2.1 Treat equipment and materials in areas controlled for removable contamination or airborne radioactivity as radioactive material. do not release these items from these areas to uncontrolled areas if measurements of accessible surfaces exceed the unrestricted release criteria.

3.2.2 Treat equipment and materials as radioactive material and do not release from radiological areas to uncontrolled areas if prior use would indicate that contamination levels on inaccessible surfaces are likely to exceed the release criteria.

- Evaluate items being surveyed for release for internal contamination and contamination under any coatings.

- Any equipment or system component should be disassembled to the extent required to perform an adequate survey, surveyed and shown to be free of contamination above the release criteria.

3.2.3 Equipment and materials exceeding the total or removable contamination levels specified in Table 1 may be conditionally released for movement on-site from one radiological area to another radiological area only if appropriate monitoring and controls are established and exercised.

- Prior to transfer from an area with removable surface (or airborne) contamination to a Radioactive Materials Area, or between areas with removable surface or airborne contamination, contain any item exceeding the removable contamination criteria by wrapping or bagging the item.

- Attach a Radioactive Material Tag to the outer surface and enter the contact radiation levels and the contamination levels of the object inside the bag or wrapping.

- If radiation levels are above 100 mrem/hr at 100 cm from the surface, the item may only be transferred to areas posted as High or Very High Radiation Areas.

- Once material is packaged and tagged for transport, make the actual transfer as soon as practical to minimize the possibility of contaminating the exterior of the package.

3.3 Documentation

3.3.1 Radiological Surveys

- Document and maintain the results of surveys for radiation and contamination.
- Records should contain sufficient detail to be meaningful after the originator is no longer available.
- The value of most surveys is enhanced by the use of drawings of the room, building, area, or equipment which clearly define the areas and results observed. the value of the drawing will be further enhanced by inserting fixed objects or points which serve as benchmarks to facilitate the relocation of data points.
- Survey documentation should support a chronological, historical record that clearly establishes the area conditions.

  - Include the following on all survey documentation:
  - Date, time, and purpose of the survey.
  - General and specific location of the survey.
  - Printed name and signature of the surveyor and analyst.
  - Printed name and signature of the Project Safety Officer reviewing the survey for adequacy
  - Pertinent information needed to interpret survey results (i.e., instrument efficiencies, minimum detectable activities, area background radiation levels, instrument background, etc.)
  - Reference to the appropriate Health and Safety Plan is the survey is used to support the Plan.
  - Field instrument model(s), and serial number(s).
  - Results of the measurements of area dose rates.
  - Model and serial number of non-portable counting equipment.
  - Contamination levels (using appropriate units, pCi/g, dpm/100cm^2, uCi/ml, etc.), and appropriate supporting parameters including: counting efficiencies, counting time, correction factors, type of radiation, and whether the contamination was fixed or removable.
  - Locations of areas with levels greater than the prescribed limits.
  - Amplifying remarks regarding the ultimate disposition of the area, equipment, facility, etc.

NOTE

Instruments used in surveys should be directly linked to instrument capability, calibration, and maintenance records.

- Following review and app oval of the survey, the survey should be retained with the project records.

- All survey results shall be reviewed by the PSO. The PSO shall sign and date the survey map cover sheet and attached maps indicating acceptance of the content and scope of the survey.

- The PSO shall compile and review all survey data with corrective actions when action levels are exceeded.

3.3.2 Unrestricted Release Surveys

- Document and maintain records of surveys for the release of materials and equipment.

- Record the following data in the site work log in addition to the normally required survey data for released equipment, materials, or property :

  ⇒ A description or identification of the item (include property or serial numbers where available;

  ⇒ The identity of the recipient or the destination of the released item;

  ⇒ The date of the survey;

  ⇒ The printed name and signature of the person performing the survey;

  ⇒ The type and identification number of the instruments used;

  ⇒ The results (restricted or unrestricted release) of the survey;

- After the survey is complete and the data properly recorded, the survey documentation should be maintained with the project records.

3.3.3 Radioactive Material Identification

- Labels should include contact radiation levels, removable surface contamination levels (specified as alpha or beta-gamma as appropriate), dates surveyed, surveyor's name, and description of the item(s).

- The radioactive material tag is used to tag or identify radioactive materials, unless another or alternative method of identification is approved by the Project Safety Officer

Air Sampling

1.0 PURPOSE

The purpose of this procedure is to present the technique and methodology for performing and evaluating airborne radioactivity measurements using either area High volume) air samplers, or personal (lapel) air samplers, and subsequent analysis using a fixed counting system

2.0 GENERAL

2.1 Definitions

2.1.1 Airborne radioactive contamination - l radioactive material suspended in the air either by resuspension during work activities, or release from systems or components under pressure.

2.1.2 High volume air sampler - an air sampling pump which is typically used to collect samples of general area or environmental atmospheres for subsequent analysis. These samples usually have sample flows greater than 3 cubic feet per minute.

2.1.3 Lapel air sampler - an air sampler which is used to collect an air sample in the breathing zone of the worker (a 2' diameter sphere around the workers head) usually attached to the workers lapel.

2.2 References

2.2.1 10 CFR 20, *Standards for Protection against Radiation*

2.2.2 10 CFR 835, *Department of Energy Occupational Radiation Protection*

2.2.3 AIK-M4, *Site Specific Health and Safety Plan*

2.2.4 ANSI N323, *Radiation Protection Instrumentation Test and Calibration*, September 1977

2.3 Prerequisites, Precautions, and Limitations

2.3.1 Prior to the collection of air samples of either type, the surveyor should be knowledgeable about the purpose of the sample. For work area or job coverage data this should include:

- The nature of the work in progress (excavation, grinding, disassembly, abrasive blasting, etc);
- The specific component or equipment being worked on;
- The positions craftsmen make take to perform the work (lying down, climbing, etc.);
- The sources of airborne radioactivity in the area;
- The potential levels of airborne radioactivity in the area;
- Activities which are expected to significantly alter radiological conditions in the area.

2.3.2 Personnel shall not enter areas where hazardous environments caused by hazardous chemicals or oxygen deficient atmospheres exist or could exist until the areas have been monitored and approved for entry by site safety personnel.

2.3.3 Assessments are performed for airborne radioactive contamination in areas where results provide information for classifying, releasing, or restricting access and activities which may be performed inside the area.

3.0 GUIDELINE

3.1 Airborne Contamination Survey Purposes/Programs

3.1.1 Routine Air Sampling is performed as an ongoing periodic surveillance of general site radiological conditions. The purpose of these surveys are to detect changes in radiological conditions and demonstrate that appropriate postings/controls are in place.

- The schedule of routine surveys should be periodically reviewed/modified to reflect any changes in the scope of operations.
- Routine air samples at the site or work area boundary will normally be collected using a low volume air sampler.

NOTE:

Do not use background or 0 ("zero" for a data entry. If the readings are sufficiently low, enter "< ### (MDA for instrument used)" at the data point, and clearly state the MDA on the survey data sheet.

NOTE:

Survey data that differ from previously collected data in the same area should be closely evaluated to determine the cause of the variance.

3.1.2 Job or Task-Specific Air Samples

Job-specific air samples are performed in specific work areas to determine the extent of the airborne radiological hazards, establish radiological protective measures or controls, and monitor personnel exposure. These air samples should include, as appropriate, evaluations of pre-job conditions, job or task coverage evolutions, or other work-related functions.

- Work-specific surveys should be performed in accordance with the general guidelines provided in this procedure. These air samples will generally consist of low volume "grab" samples, and when practical or necessary to accurately evaluate a workers exposure, lapel air samples.

NOTE:

Do not use "background" for a data entry. If the reading is sufficiently low, enter "< ### (MDA for instrument used)", or < (the prescribed limit for the isotope of interest) at the data point.

3.1.3 Airborne Radioactivity Surveys

Airborne radioactivity surveys are performed to evaluate the potential hazard from inhalation of airborne radioactive material.

3.1.3.1 Particulate Sampling

- Air sampling on site will be performed for airborne radioactive material in the particulate form.
- Low volume particulate samplers are normally set in the range of 1 to 4 standard cubic feet per minute (SCFM).
- High volume particulate air samplers are normally set in the range of 4 to 8 SCFM.
- Low volume or high volume air samples should collect a minimum volume of 225 cubic feet.
- Lapel air samples are normally collected at a rate of 3 to 10 liters per minute. If possible, a minimum volume of 6.35 E6 milliliters should be collected. However, if this sample volume cannot be obtained, the sample should be collected for the duration of the work activity under evaluation.
- Air sampling equipment should be placed in such a manner as to accurately sample the airborne environment of concern, (i.e., worker exposure or release to the uncontrolled areas of the site or work area).
    - For non-uniform or localized sources of activity, breathing zone samples should be obtained. These samples should be obtained as follows:
        - Sampler head within a 2 foot diameter sphere surrounding the workers head.
        - During the phases of the job or task which will produce the highest airborne radioactivity, and;
        - Anytime the airborne radioactivity cannot be predicted.
    - Air sampler start time, starting flow rate, end time and ending flow rate should be recorded on an Air Sample Data Sheet similar to Attachment 1.

NOTE:

Do not use "background" or 0, "zero" for a data entry. If the reading is sufficiently low, enter "< ### (MDA for instrument used)", or < (the prescribed limit for the isotope of interest) at the data point.

3.1.4 Sample Counting

- Particulate samples shall be analyzed for both alpha and beta-gamma activity.

NOTE

Due to naturally occurring radon and thorium gases in the atmosphere and their particulate daughters being carried directly or indirectly on dust, air samples may show significant activity from these isotopes alone. Radon daughters, whose longest half-life is approximately 45 minutes, may be considered as completely decayed four hours after the completion of sampling. Thoron daughters, whose longest half-life is 10.6 hours should take approximately 72 hours to be considered completely decayed.

- Gross beta gamma analysis should be performed by a minimum 10 minute count on a BC-4, or equivalent, in a background of less than 40 cpm.

- Long-lived radionuclide activity can be calculated after determining that any radon and thorium components have decayed.

- Radionuclide half-life can be estimated using the following equation.

$$T_{1/2} = \frac{(.693)(time)}{-\ln\left(\frac{A}{A_O}\right)}$$

Where :

$T_{½}$ = Half-Life
time = The time between the two counts in question
A_O = Activity of the first count (ccpm)
A = Activity of the second count (ccpm)
ccpm = Corrected Counts per Minute

- Count air samples at a minimum of 60 minute intervals to determine if a radon component is present. The calculated half-life for the radon component will normally fall between 30 - 60 minutes.
- Document these calculations on the Air Sample Data Sheet.
- If it is determined that there is a radon component, subsequent counting of the air sample should occur on a daily basis to determine if there is a thorium component. This should be done for the 72 hour period following the air sampling.
- If subsequent counting indicates that no further noticeable decay is occurring, the long lived activity and Derived Air Concentration (DAC) values can be calculated. These values can be calculated using the following formulas:

$$\text{Long Lived Activity } (\mu Ci/ml) = \frac{\text{activity}}{\text{eff x vol x 2.22 E6}}$$

Where:

activity = corrected air sample activity (ccpm)
eff = counter efficiency
vol = air sample volume in milliliters

$$DAC = \frac{\text{Long Lived Activity}}{DAC_{Lim}}$$

Where:
Long Lived Activity = Calculated activity of decayed sample

DAC_{Lim} = Air sample concentration limits

Limit for work in the Radiologically Controlled Area = 5.00 E -10
Limit at the Project Boundary = 3.00 E -12

- Long lived activity and DAC results should be recorded on the Air Sample Data Sheet.
- Air sample results should be recorded on an Air Sample Log Sheet, similar to attachment 2.

3.2 Survey Review/Notifications/Follow-Up Actions

3.2.1 The individual performing the survey is responsible for the documentation of the collected data, and the control of the area or task in a safe and effective manner and to bring to the attention of the Project Safety Officer any conditions which have changed significantly from previous surveys or anticipated pre-job conditions.

3.2.2 If the calculated half-life ($T_{1/2}$) is greater than 60 minutes the following actions should be taken:

- Contact the Project Safety Officer.
- Recount the sample and calculate the $T_{1/2}$ Value
- Obtain a backup sample in the suspect area
- Ensure that time keeping is implemented for all personnel working in the area. this will provide exposure time data for the assignment of DAC-Hours if it is determined that airborne activity (other than natural) exists.

3.2.3 If the calculated long-lived activity DAC value for an air sample collected in the exclusion area exceeds 0.30 DAC, the following actions should be taken:

- Complete all steps detailed in Section 3.2.2;

- Implement respiratory protection requirements, and if necessary, revise the HASP to reflect the identified conditions;
- Investigate the need for bioassay sampling of workers.

3.2.4 If the calculated long-lived activity DAC value for an air sample at the project site perimeter exceeds 0.30 DAC, the following actions should be taken:

- Complete all steps taken in Section 3.2.3;
- Evaluate controls of offsite releases and initiate engineering controls as necessary

3.3 Records

3.3.1 Air Sample Logs and Data Sheets

- Document and maintain the results of airborne radioactivity surveys.
- Records should contain sufficient detail to be meaningful after the originator is no longer available.
- The value of most surveys is enhanced by the use of drawings of the room, building, area, or equipment which clearly define the areas and results observed. the value of the drawing will be further enhanced by inserting fixed objects or points which serve as benchmarks to facilitate the relocation of data points.
- Survey documentation should support a chronological, historical record that clearly establishes the area conditions.
- Include the following on all survey documentation:
- Date, time, and purpose of the survey.
- General and specific location of the survey.
- Printed name and signature of the surveyor and analyst.
- Printed name and signature of the Project Safety Officer reviewing the survey for adequacy
- Pertinent information needed to interpret survey results (i.e., instrument efficiencies, minimum detectable activities, area background radiation levels, instrument background, etc.)
- Reference to the appropriate Health and Safety Plan is the survey is used to support the Plan.
- Field instrument model(s), and serial number(s).
- Results of the measurements of area dose rates.

- Model and serial number of non-portable counting equipment.
- Airborne radioactivity levels.
- Locations of samplers.
- Amplifying remarks regarding the ultimate disposition of the area, equipment, facility, etc.

NOTE

Instruments used in surveys should be directly linked to instrument capability, calibration, and maintenance records.

- Following review and approval of the data, the data should be retained with the project records.
- All air sample data shall be reviewed by the PSO. The PSO shall sign and date the data sheet and attached maps indicating acceptance of the content and scope of the data.
- The PSO shall compile and review all data with corrective actions when action levels are exceeded.
    - The radioactive material tag is used to tag or identify radioactive materials, unless another or alternative method of identification is approved by the Project Safety Officer.

AIR SAMPLE DATA SHEET

Air Sample # _____ Air Sampler # _____ Sampled By _____

RWP # _____ Prevailing wind from the _____

Job Description/Location _____

Instrument A (Type/ID)		Instrument B (Type/ID)	
Start Date		End Date	
Start Time		End Time	
Beginning Flow		Ending Flow	
Average Flow Rate		Sample Volume (ml)	

Note : To convert cubic feet to milliliters -> Cubic Feet (ft^3) X 2.832 E +4 = milliliters (ml)
To convert liters to milliliters multiply liters by 1000

Limit in Radiologically Controlled Area → 5.00 E -10 µCi/ml Limit at Project Boundary → 3.00 E -12 µCi/ml

COUNTING DATA

$$-\ln\left(\frac{\quad}{A_O}\right)$$

Instr	Date	Time	Background (cpm)	Net Counts (ccpm)	Sample Activity (dpm)	Half-life ($T_{1/2}$)

Long-Lived Radionuclide Activity	**µCi/ml**	**DAC**

Reviewed By _____

Attachment 1

AIR SAMPLE DATA LOG SHEET

A/S #	Date	Time	RWP	Location	Vol.	Results	Comments	By

Reviewed By _____

12/068

TELEPHONE CONVERSATION LOG

PERSON CALLED:	ORGANIZATION:	TELEPHONE NUMBER:
Dr. Ed David and Dennis Beisel of Brown & Root	Ronson Metals Corporation	908-234-9319
LICENSE NUMBER: STB 1451	DOCKET NUMBER: 040-08843	MAIL CONTROL NUMBER: 121068

PERSON CALLING:

Steve W. Shaffer
USNRC Region I
475 Allendale Road
King of Prussia, PA 19406

(610) 337-5256
FAX Numbers
(610) 337-5269 or
(610) 337-5393

SUBJECT: Deficiency response dated December 16, 1996.

SUMMARY:

Please provide the following information:

1. Item 1 paragraph 2, of your response references certain safety related procedures. These procedures must be provided.

2. Item 2 discusses the use of air monitoring equipment. Please provide a specific commitment as to when air sampling shall be performed, when it will be analyzed, and the concentration levels that will trigger procedural changes and/or investigations.

3. Please note that the methodology outline in Item 4 of your response will suffice for field characterization during decommissioning work. An radioisotopic analysis shall be required for your final site status survey.

4. Please confirm that the initials of the individual performing the surveys referenced in item 7 of your response shall be added to the survey documentation.

5. Item 9 appears to be a cursory summary/outline of your final site survey plan. No determination of its adequacy can be determined from the information provided. If you wish to have this survey plan approved please submit a detailed survey plan.

6. Item 12 discusses the use of a Ludlum Model 2929 for soil sample analyses. This would only be capable of gross counting. This method of analysis will require your cut off concentration to be five picocuries per gram, the limit for radium-226, unless a specific area sampling was performed to determine an accurate concentration ratio for all contaminates.

MOTION REQUIRED/TAKEN: MILESTONE 15

SIGNATURE: Steve W. Shaffer

DATE: January 21, 1997

TOTAL P.02

EXECUTIVE OFFICES

RONSON CORPORATION
CORPORATE PARK III CAMPUS DRIVE
P.O. BOX 6707 SOMERSET, NEW JERSEY 08875-6707

TELEPHONE • 908-469-8300
TELEX 219192

Brown + Root Environmental

NAME Dennis Beissel

FAX NO. 301-258-8679

NUMBER OF PAGES/INCLUDING COVER PAGE 5

SENT FROM Daryl Holcomb

DATE 11/19/96

IF YOU DO NOT RECEIVE ALL THE PAGES BEING TRANSMITTED, PLEASE CALL DAWN AT 908/469-8300 x18.

11/19

COMMENTS: Dennis,

Attached is a copy of the letter from Steve Shaffer of 11/18/96. J.A. Walker + I will call you at 11:00 am, on 11/20 to discuss. We would like Duane to be available as well.

Thanks
Daryl

NOV 18 1996

License No. STB-1451
Docket No. 040-08843
Control No. 121068

Daryl Holcomb, Chief Financial Officer
Ronson Metals Corporation
Corporate Park III - Campus Drive
P.O. Box 6707
Somerset, New Jersey 08875-6707

Dear Mr. Holcomb:

This is in reference to your submission dated November 1, 1996, transmitting your decommissioning plan for portions of the Ronson Metals Corporation facility in Newark, New Jersey, License No. STB-1451. In order to continue our review, we need the following additional information:

1. Section 2 of the RONSON Decommissioning Plan for Building 7, Area E and Area F (Plan) covers the scope of decommissioning activities. The Plan does not include any specific procedures for the expected decontamination activities. Please provide procedures for the expected decontamination activities. These procedures should also include the safety precautions to be taken and radiological monitoring that will be required during these activities.

2. The activities outlined in Section 2 could possibly create airborne exposure hazards. Please provide a detailed description of the air monitoring to be performed during the decontamination activities.

3. Section 2.1.2 of the Plan discusses the vacuuming and the abrasive blasting of the floor of the building. Please confirm that all vacuumed material and byproducts of the abrasive blasting shall be disposed of as radioactive waste.

4. Section 3.2 of the Plan states, in part, that only soil with concentrations greater than 10 picocuries per gram of thorium shall be removed. The release criterion of 10 picocuries per gram for thorium (above background) assumes that thorium-232 is in equilibrium with its daughter thorium-228. Please confirm that soil cleanup shall be done to the criteria of five picocuries per gram of thorium-232 and thorium-228, respectively.

Past sampling at the site has demonstrated that radium-226 is also a contaminant at this site. The soil concentration criterion for radium-226 is five picocuries per gram. If radium-226 and thorium are both present then the criterion for release should be the sum of their individual activities divided by their individual criterion. Please confirm that cleanup shall be done to these criteria.

5. Section 3.3 of the Plan discusses the calibration of survey equipment. Describe your instrument calibration procedure. If you intend to contract out the calibration of your instruments, you only need to specify the name of the firm and the license number that authorizes the firm to perform calibration services. If you elect to calibrate your survey meters yourself, please submit the information described in "Guide for the Preparation of Licenses for the Use of Radioactive Materials in Calibrating Radiation Survey and Monitoring Instruments" (Task FC 413-4)(enclosed).

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8. Section 3.5 of the Plan discusses radioactive waste management and states that all packages shall be properly packaged and labelled. Please confirm that your packaging and labelling shall be in accordance with the NRC's requirements in 10 CFR Parts 20 and 71.

9. Section 4 of the Plan summarizes your final radiation survey methodology. Please provide more detailed information describing the final survey methodology. Include survey frequencies for the different areas, both affected and unaffected, and the soil sampling plan for areas E, F, and the holes in the floor of building 7.

10. Table 2 in Appendix C of your Plan summarizes your intended release limits for activities when the isotope(s) of origin are unknown. In cases where the isotope(s) of origin are unknown, the most limiting criteria must be used or sampling must be done to determine the source of radioactivity. Also, please note that the thorium criteria, although not clearly stated in our guidance, is the alpha particle activity. Therefore, for contamination that was purely thorium, and measured via beta decay, the criterion should be 670 disintegrations per minute averaged over 100 square centimeters. Your table also appears to use the maximum allowable criteria for radium-226 as your basis for your release criteria. The average criteria should be used for the basis of general release criteria. The maximum release criteria should only be used as basis for spot or small area criteria. Please resubmit Table 2 with your revised release criteria.

11. Appendix C of the Plan discusses the method you are using for your minimum detectable activity (MDA) calculations. Please provide a description of each survey instrument/probe combination and your MDA calculation for each combination.

12. Appendix C of the Plan does not address analysis of soil samples. Describe how you intend to have your soil samples analyzed and the number of split samples that will be analyzed by an independent laboratory under your quality assurance program.

We will continue our review upon receipt of this information. Please reply in duplicate to my attention at the Region I Office and refer to Mail Control No. 121068. If you have any technical questions regarding this deficiency letter, please call me at (610) 337-5256.

In order to continue prompt review of your application, we request that you submit your response to this letter within 30 calendar days from the date of this letter.

Sincerely,

Original Signed By:
Steve W. Shaffer

Steve W. Shaffer
Division of Nuclear Materials Safety

License No. STB-1451
Docket No. 040-08843
Control No. 121068

Enclosures:
1. 10 CFR Parts 19, 20, 40, and 71
2. Guide for the Preparation of Licenses for the Use of Radioactive Materials in Calibrating Radiation Survey and Monitoring Instruments (Task FC 413-4)

cc:
State of New Jersey

Jeffery A. Walder, Attorney for RMC
Walder, Sondak & Brogan, P.A.
5 Becker Farm Road
Roseland, New Jersey 07068

Brown & Root Environmental

910 Clopper Road
Gaithersburg, MD 20878-1399

EPC-96-301

December 13, 1996

Mr. Daryl Holcomb
Chief Financial Officer
Ronson Corporation
P.O. Box 6707
Somerset, NJ 08875-6707

Subject: Response to NRC Comments
Building #7 Decommissioning Plan
Ronson Metals Corporation, Newark, New Jersey

Dear Mr. Holcomb:

Attached are Brown and Root Environmental's responses to the November 18, 1996 NRC comments on the Building #7 Decommissioning Plan. The responses have also been forwarded to Dr. David for his review. The itemized responses, along with the two paragraphs modifying Section 2.12 previously, are intended to be used for your transmittal to the NRC Region 1 office. If you have any questions please contact me at 301/258-8736 or Dwaine Brown at 1/800-368-5497.

Sincerely

Dennis R. Beissel, P.G.
Project Manager
Brown and Root Environmental

cc. Leo Montroy
Dwaine Brown
Joseph Balac
Barry Brosch
Edward David, PhD
File

Response to NRC Comments on the RMC Building 7, Areas E & F Decommissioning Plan

Item 1

The specific procedures for the decontamination of the floor area of building 7 are held proprietary by the vendor (Icesolv) and will primarily address the operation of their abrasive blasting equipment. These procedures are attached.

Procedures for personal air sampling (lapel), area air sampling (low volume samplers), performance of radiation and contamination surveys will be provided. The safety controls on the work activities will be presented in the Site Specific Health and Safety Plan which will also include the actions to ensure worker protection during the excavation and packaging of the small quantity of soil in Area E.

Item 2

Two types of air monitoring will be used for evaluation of the airborne concentrations during the decontamination activities. Lapel air samplers which will sample the worker breathing zone, and area air samplers which will be used to evaluate the general area conditions within the facility. Because of the media recovery system on the abrasive blasting equipment it is not anticipated that airborne radioactivity will exceed 0.1 Derived Air Concentration.

Item 3

All materials generated from the application of abrasive blasting technology will be treated as radioactive waste. This volume has already been considered in the estimated 60 cubic feet of material resulting from the decontamiantion of Buildling 7.

Item 4

The proposed NRC method of evaluating a mix of isotopes means that the sum of the ratios of the various contaminant concentrations and their respective release criteria must be less than unity in order to qualify for unrestricted release. The contaminated soil in Area E will be excavated to a clean-up level of 10 picocuries/gram total thorium and 5 picocuries/gram of Ra226. This will be accomplished by excavating to 5 picocuries/gram gross alpha radiation as measured in the field.

Item 5

All instruments used for the decontamination activities are leased from GTS Instrument Services, 2045 Route 286, Pittsburgh, PA, Telephone # (412) 733-1900. These instruments are received in the field already calibrated to sources traceable to the National Institute for Standards and Technology (NIST) and accompanied by exempt quantity sources to be used for the performance of daily response checks. GTS's NRC License number is # 37-28097-01.

Item 6

The Brown and Root respiratory protection program complies with the requirements of 29 CFR 1910.134, ANSI Z88.2, 1992, 10 CFR 20.1703, 29 CFR 1910.1001, 30 CFR 11, and NUREG - 0041.

Item 7

Documentation of surveys performed for the evaluation of the worker environment, status of the decontamination efforts, and area habitability will include:

- A drawing or map of the area or component as appropriate
- Type, model, and serial number(s) of instruments and detectors used
- Calibration status (when performed, when due for re-calibration)
- Results of daily functional tests
- Printed name and signature of individual performing survey or sampling
- Date and time that the survey was performed
- Printed name and signature of the individual reviewing the survey for accuracy and legibility
- Description of activity or purpose for survey (special, daily, etc.)
- Calculated minimum detectable activity as appropriate

Item 8

All containers of radioactive waste will be packaged and labeled in accordance with the requirements of 10 CFR Parts 20 and 71. Additionally, prior to shipment for disposal, all containers will be manifested and placarded in accordance with the requirements of the Department of Transportation.

Item 9

Conduct of Surveys and Sampling

1. Reference Grid System - The radiological measurements and samples will be collected relative to a grid system that has been prepared for the areas. It should be noted that the grids described are intended primarily for reference purposes and do not necessarily dictate the spacing of radiological survey measurements or sampling. Closer spaced or other variously described survey locations may be required to demonstrate that average and hot-spot guidelines are met to the necessary level of confidence. The grid system is established to:

- facilitate selection of systematic measuring/sampling locations,
- provide a mechanism for referencing a measurement/sample back to a specific location so that the same survey point can be relocated, and
- provide a convenient means for documenting average radioactivity levels.

The system is established in reference to a fixed facility location or bench mark. Typical grid systems consist of mutually perpendicular lines spaced at equal intervals dividing the survey area into blocks of equal area. The intersections of these lines are referred to as grid points. The grid area is the functional unit used for making comparisons with guideline values and to assess the adequacy of remedial action.

A drawing of the grid system will indicate the grid, facility boundaries, and other pertinent site features and provides a legend showing the scale and reference compass direction.

The grid area considered appropriate for outdoor surveys is 100 ft^2. The grid size may be increased or decreased depending on the potential for contamination, size of the area to ensure statistically accurate representation of the area, facility layout, and the type of survey being performed.

2. Grid Marking and Grid Point Identification - The grid will be laid out on the property and field-marked using stakes, hubs, spikes, paint, flags, or survey tape. The selection of an appropriate marker is based on the characteristics and routine uses of the surface.

   Two basic coordinate systems will be used for identifying points on a grid system. The grid system may reference distances from the 0,0 point using the compass directions N (north), S (south), E (east), W (west). The other system may reference distance along and to the R (right) or L (left) of the baseline.

3. Radiation Measurements (Characterization)

A. Scanning - Scanning surveys are performed to locate and define the areal extent of radiation anomalies indicating residual gross radioactivity or hot-spots that will indicate the necessity for further investigation or action.

   The surveyor will use portable radiation detection instrumentation for detecting the presence of elevated radiation levels on a specific surface.

B. Systematic Measurements and Samples - Using the established grid system, discrete radiological measurements or samples may be taken at systematic locations (e.g., at grid points and/or at the center of grid blocks, or random points per grid block or blocks). These measurements or samples provide definitive radiation levels at precisely defined locations. These measurements also allow for the calculation of average radiation levels within a given area for purposes of comparison with other areas, background samples, or to estimate potential health effects to people occupying that area. Systematic measurements may include alpha, beta, beta-gamma, low-energy x or gamma radiation. Samples typically include surface and sub-surface soil samples and routine evaluations for transferable surface contamination. All measurement locations and results are recorded. Additionally the collection of core drilled samples through the concrete slab will be performed to evaluate the migration of contamination through stress cracks in the slab. The collection point of these samples will be determined by the radiation and contamination levels observed during the performance of the scanning survey and visual evidence of material spills.

C. Biased Measurements and Samples - Biased radiological measurements may be taken ("biased" indicates that the locations are not chosen on a random or systematic basis) at locations where anomalous radiation levels are observed. The purpose of these measurements and samples are to further define the areal extent of potential contamination and to determine the maximum radiation levels within an area. These measurements may include alpha, beta, beta-gamma, low-energy x or gamma radiation, and may also be supplemented with other types of atypical measurements such as radon flux or gamma spectroscopic measurements. Air, water, soil and transferable contamination samples may typically be taken at these locations; samples of vegetation or sediment may be appropriate. All sample and measurement locations and results are recorded.

Sampling and Analysis

Required Equipment

Instruments and samplers:

Ludlum Model 19 survey meter
Ludlum Model 12 with Ludlum Model 44 -9 GM detector
Ludlum Model 12 with Ludlum Model 43 -5 Alpha detector
Low Volume Air Sampler
Lapel Air Sampler (one for each worker in the contaminated area)
High Volume Air Samplers
Ludlum Model 2929 Sample Counter with Ludlum Model 43 - 10 - 1 Alpha and Beta Detector

Protective Clothing (as required)

Coveralls
Hood
Gloves
Shoe covers
disposable booties

Respiratory Protection Equipment

One air purifying respirator (HEPA filter cartridge) per worker if the area becomes an airborne radioactivity area

Laboratory Analytical Support

- Radium-226, Thorium - 232, Thorium - 228 (criteria for screening these samples using the Ludlum 2929 will be established and this analysis will only be required if gross Alpha or beta-gamma activity is above a predetermined level)

Gross alpha and beta-gamma measurements may be determined using the Ludlum Model 2929 by onsite health protection personnel.

Area Control Equipment

Warning signs:
- Contamination Area
- Airborne Radioactivity Area
- Radiation Area

Yellow and magenta barrier rope or ribbon

Item 10

Al isotopes in the areas of concern have been identified in the site characterization program, therefore the criteria as presented in Table 1 of the decommissioning plan will apply in all cases by isotope. Additionaliy, areas will not be released based soley on beta decay measurements, therefore the 670 disintegrations per minute averaged over 100 square centimeters will not be used. We have only used this criteria in the past when it was necessary to release materials or equipment and the surfaces were damp and the alpha emissions were shielded by the moisture. We do not anticipate this situation at Manufacturers Place.

Item 11

The instruments to be used are described in the response to Item 9. The Minimum Detectable Activity (MDA) will be determined based on the documented efficiency of the specific instrument using the described methodology. The MDA will be evaluated daily and documented as part of the survey/sampling records.

Item 12

Soil samples will be evaluated using the Ludlum Model 2929 configuration described in response to Item 9. A maximum 10 % samples which indicate a gross alpha activity in excess of 10 pCi/g will be sent to an independent laboratory for analysis. A 10% split will be performed with the NRC if required.

IceSolv, Inc.

PROCESS PROCEDURE

ISI - 110

Concrete Scarifier

Reviewed: William E Briggs 11/22/96
Chief Operating Officer Date:

Reviewed: David L. LeBlanc 11/22/96
President Date:

1.0 SCOPE

Provide a mechanism for decontaminating a concrete floor using Scarifying equipment.

2.0 Definitions

2.1 PPE - Personal Protective Equipment.

2.2 HEPA Vac - High Efficiency Particulate Air Vacuum.

2.3 Scarifier - Coating and Concrete removal.

3.0 References

3.1 Equipment Manufacturers Literature

4.0 Procedure

4.1 Initial Conditions

4.1.1 Floor area must be free of obstructions. e.g. movable machinery.

4.1.2 Free standing water must be removed prior to start.

4.1.3 All loose debris must be removed. e.g. wood, trash, cords and excessive dirt.

4.1.4 Electrical outlets must be available and or ample air supply.

4.1.5 Sufficient overhead lighting.

4.1.6 Verification that Scarifier, HEPA Vac and ventilation are operational.

4.1.7 Proper precondition reports are supplied to IceSolv, Inc. personnel.

4.1.8 Proper PPE is available prior to start.

4.1.9 Personnel are qualified to perform task.

4.1.10 Approved waste containers in sufficient quantities to handle all waste.

4.2 Scarifying Floors

4.2.1 Surveys must be reviewed to verify where the highest contamination areas are located.

4.2.2 Connect the HEPA VAC hose to the Scarifier system prior to starting.

4.2.3 Stage waste containers for easy transfer of waste from the vacuum.

4.2.4 Property Don all PPE.

4.2.5 Keep the Scarifier cutters above the surface to be cleaned while energizing the system.

4.2.6 Energize the vacuum prior to starting of the Scarifier.

4.2.7 Energize the Scarifier and slowly move the system over the surface to be cleaned.

4.2.8 Stop Scarifier and deenergize after doing a very small area so that a survey may be taken to see if you are obtaining the desired results.

4.2.9 If desired results are not obtained repeat steps 4.2.7 and 4.2.8 until the area to be cleaned is free of all contaminants.

4.2.10 Have the contaminated area surveyed and released by the customer prior to the removal of any equipment.

4.3 Following the Decontamination Process and Post Decontamination Surveys.

4.3.1 After verification that the area is cleaned of all contaminants. Survey all of the equipment to verify that it is radiologically and chemically free released. Property store it in a clean dry secured area for return to the IceSolv, Inc. Office.

4.3.2 Have the customer or their approved representative sign off the job as complete and acceptable

5.0 Exceptions None

6.0 Attachments None

NOV 18 1996

Concerning: License No. STB-1451
Docket No. 040-08843
Control No. 121068

Daryl Holcomb, Chief Financial Officer
Ronson Metals Corporation
Corporate Park III - Campus Drive
P.O. Box 6707
Somerset, New Jersey 08875-6707

Dear Mr. Holcomb:

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In order to continue prompt review of your application, we request that you submit your response to this letter within 30 calendar days from the date of this letter.

Sincerely,

Original Signed By:
Steve W. Shaffer

Steve W. Shaffer
Division of Nuclear Materials Safety

License No. STB-1451
Docket No. 040-08843
Control No. 121068

Enclosures:
1. 10 CFR Parts 19, 20, 40, and 71
2. Guide for the Preparation of Licenses for the Use of Radioactive Materials in Calibrating Radiation Survey and Monitoring Instruments (Task FC 413-4)

cc:
State of New Jersey

Jeffery A. Walder, Attorney for RMC
Walder, Sondak & Brogan, P.A.
5 Becker Farm Road
Roseland, New Jersey 07068

Final Verification Survey Plan

Ronson Metals Corporation
Building 7, Area E, and Area F
55 Manufacturers Place
Newark, New Jersey

Prepared by
Brown & Root Environmental
March 24, 1997

TABLE OF CONTENTS

LIST OF TABLES

FINAL VERIFICATION SURVEY PLAN

1.0 INTRODUCTION

The Final Verification Survey for the Decommissioning of Building #7 and Area E will be conducted during and immediately after decontamination activity is completed on the floor of Building #7 and the small contaminated soil area in Area E. Details of the decontamination activity are contained in the November 1, 1996 Decommissioning Plan for Building 7, Area E, and Area F. Area F does not require decontamination.

Due to the nature of the contamination, and the estimated extent of the contamination determined to be fixed in Building 7, both the horizontal floor surfaces, vertical walls, and the overhead ceiling areas must be surveyed. The necessary surveys will be conducted in conjunction with the ongoing remedial actions to evaluate the effectiveness of the decontamination effort and for the protection of workers.

The number of data points (samples either collected for subsequent analysis or direct readings when possible on surfaces) will be based on the potential for residual activity or for the spread of activity due to remedial actions. Contamination potential has been based on a review of the site history and the results of the preliminary assessment and the characterization survey. To the extent that locations of measurements or sampling in support of characterization, remedial action control, or other previous surveys have not been compromised in the intervening period since these initial surveys were performed, it is assumed that the radiological status is unchanged and that data may be used in support of the final status survey.

2.0 AREA CLASSIFICATION

The areas under consideration have been divided into affected and unaffected areas for the purpose of establishing the sampling and measurement requirements. The bases for these classifications are:

Affected area - Areas that have potential or identified radioactive contamination based on site history or characterization survey data. This includes areas where radioactive materials were used or stored, and areas immediately adjacent to or surrounding these areas. The affected area identified in Building #7 is the upper surface of the concrete floor. In Area E, the affected Area is several square ft of soil near Building #5.

Unaffected area - All areas not classified as affected. These areas are not expected to contain residual radioactivity, based on previously conducted surveys and site history

3.0 REFERENCE GRIDS

Grids will be established for the purpose of referencing locations of data collection points (either samples or measurements), relative to site or building features which will provide points of reference for the reproduction of data points. All affected building floors and walls up to a height of 2 meters will be gridded at 1 meter intervals. Walls above 2 meters and ceilings will be gridded at 2 meter intervals. If residual activity above 25 % of the limit is detected in these areas, the grid spacing will be reduced to 1 meter for the area of concern. Unaffected areas will not be gridded, measurements taken in these areas will be referenced to other grid systems or to prominent immovable building features. This grid system is identical to the system used during the characterization survey. Where necessary the characterization survey grid will be reestablished, expanded, or further subdivided as necessary to fully evaluate the area of concern.

4.0 GENERAL SURVEY DOCTRINE

Building 7 will be divided into three sections for the purpose of conducting the necessary surveys; the floor area and 2 meters up the walls; the walls above 2 meters, and; the overhead or ceiling. Area F is considered an unaffected area since surveys performed by Brown and Root Environmental and Region I Nuclear Regulatory Commission staff indicated levels of contamination which were within the acceptable levels for unrestricted release of the property. The characterization surveys performed in Area E identified a single area adjacent to Building 5 with approximately 28 pCi/g ^{226}Ra, and 13 pCi/g ^{228}Th. Soils will be excavated from this area until the gross alpha and beta-gamma activity is less than 5 pCi/g. The soils immediately surrounding this excavation will be sampled and analyzed to the same criteria.

5.0 SURFACE SCANS

Scanning of surfaces to identify locations of residual contamination will be performed as follows:

Affected area surfaces - 100 % of surface

Non-contaminated walls in affected areas - 100 % scan within 1 meter of the affected surface; 20 % of wall surface more than 1 meter from affected surface; 10 % of overhead surfaces.

6.0 SURFACE ACTIVITY MEASUREMENTS

Direct Measurements

Direct measurements of alpha, and beta-gamma surface activity will be performed at 1 meter intervals on floors and lower walls of affected areas and at the same intervals on the upper walls and overhead areas which have the potential for exceeding 25 % of the

release criteria. Unless precluded by surface conditions, the most sensitive instruments will be used for direct surface measurements. All direct measurements will be performed by integrating counts over a 1 minute interval.

On upper surfaces of affected areas which are not suspected of having residual activity, measurements will be taken at a minimum of 30 locations on both vertical and horizontal surfaces. These locations will include those surfaces with the highest probability of the deposition of radioactive material, and sufficient locations to provide at least one data point for each 10 m^2 of surface area.

Removable Contamination Measurements

A smear for removable contamination will be collected at each measurement location defined above.

7.0 SOIL AND SEDIMENT SAMPLING

Surface

Samples of approximately 500 grams each of surface soils will be collected from each floor opening in Building 7 to a depth of 15 cm and analyzed for gross alpha and gross beta-gamma.

Similar samples will be collected in the identified contaminated area in Area E in the center of the contaminated area and 4 samples at a distance of 1 meter from the center of the contaminated area. The criteria for the release of these areas will be 5 pCi/g alpha or beta-gamma as measured independently.

Subsurface

Subsurface samples will be collected in the specified locations for surface samples in Area E and analyzed to the same criteria. Maximum depth of the subsurface sample(s) is estimated to be 1 meter.

8.0 BACKGROUND LEVEL DETERMINATION

Background dose rates will be determined for the building interior by taking dose rate measurements at locations of similar construction, but without a history of radioactive materials storage or use. Additional background measurements and samples will be taken at locations away from the Ronson Metals property. Background soil samples were collected during the course of site characterization and the same data will apply to the verification of remedial actions. Additional sampling or measurements will be performed if necessary during the final verification survey.

9.0 SAMPLE ANALYSIS

All soil, removable contamination, sediment, gravel, structural materials, and other large volume samples will be analyzed for gross alpha and beta-gamma. Measurement data will be converted into units of dpm/100 cm^2 (surface contamination), pCi/g (soil or volume concentrations), or μR/hr (exposure rates) as appropriate for comparison to the criterion values. Average values for survey units will be determined and compared with the criterion values.

Additional remediation and/or further sampling and measurements will be performed where guidelines are not met or cannot be verified to the specified level of confidence. The average levels will be used to estimate the total radioactivity in containerized materials prior to storage and shipment.

10.0 TECHNICAL BASIS FOR INSTRUMENTS USED AND RELEASE CRITERIA

This section establishes the technical basis by which current radiological surface release criteria are applied to accomplish decontamination prior to final decommissioning.

Radiological release criteria for surfaces are defined in ANSI N13.11, "Control of Radioactive Surface Contamination on Materials, Equipment and Facilities to Be Released for Uncontrolled Use" and in U. S. Nuclear Regulatory Commission Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors". There is no appreciable difference in decontamination criteria between these two standards. Both documents serve as guidance for establishing release criteria.

Release Criteria

The surface radiological contamination release criteria for the Ronson Metals Facility are shown in Table 1, "Surface Contamination Guidelines." These criteria are provided by US NRC Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors". The criteria in Table 1 are the maximum allowable quantities of radioactive material that may be left on surfaces of equipment and facilities that are to be released to the general public for unrestricted use. The term "Unconditional Free Release" is a generally accepted term in industry and is used synonymously with unrestricted use. For health and safety purposes, it is the policy of Brown and Root Environmental to apply the As Low As Reasonably Achievable (ALARA) philosophy to release criteria.

Release limits are grouped into several categories depending on the radiotoxicity of the radioisotope as seen in Table 1. Release limits for gross alpha and gross beta-gamma are shown in Table 2.

Table 1. Surface Contamination Guidelines

Radionuclides (2)	Allowable Total Residual Surface Contamination (dpm/100 cm^2)		
	Average (3,4)	Maximum (4,5)	Removable (4,6)
Transuranics, I-125, I-129, Ra-226, Ac-227, Ra-228, Th-228, Th-230, Pa-231	100	300	20
Th-Natural, Sr-90, I-126, I-131, I-133, Ra-223, Ra-224, U-232, Th-232	1,000	3,000	200
U-Natural, U-235, U-238, and associated decay products, alpha emitters	5,000	15,000	1,000
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above(7)	5,000	15,000	1,000

(1) 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 measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

(2) Where surface contamination by both alpha and beta-gamma emitting radionuclides exists, the limits established for alpha and beta-gamma emitting radionuclides should apply independently.

(3) Measurements of average contamination should not be averaged over and area of more than 1 m^2. For objects of less surface area, the average should be derived for each such object.

(4) The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr, respectively at 1 cm.

(5) The maximum contamination level applies to an area of not more than 100 cm^2.

(6) The amount of removable material per 100 cm^2 of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. 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. It is not necessary to use wiping techniques to measure removable contamination is direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination

(7) This category of radionuclide includes mixed fission products, including Sr-90 which has been separated from the other fission products or mixtures where Sr-90 has been enriched.

Table 2. Release Limits for Gross Activity (Unknown Isotopes) - Regulatory

Emission	Removable (dpm/100 cm^2)	Total (Fixed and Removable) (dpm/100 cm^2)
Alpha	*20	*300
Beta-Gamma	**200	**1000

* Based on TRU, Ra-226 and Th-230
** Based on Sr-90 and Th-232

Release Limits for Gross Activity (Unknown Isotopes) - ALARA Goal

Emission	Removable (dpm/100 cm^2)	Total (Fixed and Removable) (dpm/100 cm^2)
Alpha	LLD*	15
Beta-Gamma	LLD*	400

* Based on count times presented in Attachments

Natural and Electronic Background

The application of release criteria standards depends upon the effects of background. Two types of background exist: natural and electronic. Natural and electronic background significantly impact the release criteria by providing a quantity of radioactive material which is available to be detected and by influencing the least amount of radioactivity that can be measured by a particular instrument.

The following are the terms as accepted by industry practice.

Natural Background, the amount of radioactive material that exists in a substance, surface, or material as a result of nature. The quantity of natural background is generally expressed in terms of picocuries per gram (pCi/g), femtocuries per liter (10^{-15} Ci/l), milligrams per milliliter (mg/ml), disintegrations per minute (dpm), or other suitable combinations of activity or quantity per unit mass or area.

Electronic Background, the amount of electronic signal produced by electronic noise which results in a meter or scalar deflection. Instrument background is generally expressed in counts per minute (cpm), picocuries per gram (pCi/g), milligrams per liter (mg/l), or other suitable units.

Determining Background

Accurately determining both types of background must be accomplished before applying release criteria. Two industry accepted practices exist for determining natural background in materials. The first method is to measure accurately the naturally-occurring radioactivity in materials with the appropriate analytical instrument. This is accomplished by collecting a clean sample of similar material from an uncontaminated source. An example of this type of natural background determination is to measure the radioactivity in a piece of lumber from the hardware store or a quart of motor oil obtained from a retail store. The expected results for such an analysis would be 1 to 2 pCi/g in wood for natural uranium and less than 0.1 pCi/l for mixed fission products in oil. The same process can also be applied to chemical contaminants in various matrices.

The other type of material background analysis is a statistical procedure called Chauvenet's Determination. This process requires making a large number of radiation measurements in a defined area and then casting out the larger measured results. The average of the smaller remaining results is considered to be background for the defined population.

Both of these techniques may be applied for determination of natural background for the Ronson Metals Facility.

Electronic background is determined by measuring the signal output for a particular instrument when subjected to an area or matrix that contains no radioactive material other than natural or cosmic radiation. For field beta/gamma type instruments, the background typically range from 100 to 500 counts per minute. For a laboratory type alpha scintillation counter, the background could be less than 1 count per 2 minutes of counting time.

Instrumentation and Application

The Ronson Metals Facility will use field instruments, laboratory techniques, and survey techniques capable of achieving detection limits at or below the upper bounds of the release criteria stated in Table 1. Current Brown and Root Environmental instruments have LLDs lower than the surface contamination guidelines for the most restrictive nuclides shown in Table 1. Surfaces with detectable radioactive contamination levels greater than the LLD but less than the stated release criteria will be evaluated based upon ALARA analyses for decontamination, disposal, or free release. Materials greater than the release criteria will be decontaminated or disposed of as radioactive waste.

Lower Limits of Detection

The LLD as used in this technical basis document is the smallest amount of sample activity that will yield a net count for which there is a 95% confidence level that the activity is present. The LLD is an *a priori* (before the fact) estimate of the capabilities of

a given detection system. The LLD does not depend on the sample activity but rather on the detection capability of the detection process itself (i.e., detection efficiency and background count rate).

The formula for LLD is given below:

$$LLD = \frac{3 + 4.65(S_b)}{Eff(T)}$$

Where:

S_b = standard deviation of background or blank counts (C) for a counting time, defined as $\sqrt{C_b}$

T = counting time for samples, background or blanks; in units of minutes (m). All counting times are set equal.

Eff = counting efficiency in units of c/d; the number of counts (detections) per the number of disintegration from a calibration source.

This approach uses the methodology contained in Brodsky's and Gallagher's Paper, "Statistical Considerations in Practical Contamination Monitoring" published in Radiation Protection Management, Volume 8, Number 4, which discusses the derivation of the LLD formula and discusses Type I α (false detection) and Type II β (false non-detection) errors. For radioactivity measurements the LLD, as defined above, establishes a 5% chance of incorrectly detecting activity when it is absent and a 95% confidence that activity will be detected when it is present.

Typical LLDs shown in Appendix 1 have been calculated for the detection equipment to be used to determine free release levels.

Instrument Calibration

Field instruments and laboratory instruments shall be calibrated in accordance with ANSI N323, "Radiation Protection Instrumentation Test and Calibration". Instrument calibrations will be in accordance with formal procedures including reference checks and documented maintenance programs.

Quality Assurance

Instrument calibrations shall be performed with National Institute of Standards and Testing (NIST) traceable standards. Reference checks shall also be performed.

Summary

Surface contamination release criteria have been developed for the Ronson Metals Facility as shown in Table 1. Latest instrumentation technology and nuclear industry standards have been used to develop and apply these criteria. Materials may be released at or below the limits defined in Table 1. For health and safety purposes based on sound ALARA principles, it is BRE's policy to release for unrestricted use materials, equipment, and areas at the lower level of detection of the radiation detection equipment.

Appendix 1

LLDs for 1 Minute Static Counts

T = 1 min.

$S_b = \sqrt{C_{Bkg}}$

R Bkg α = 0.2 cpm
C Bkg α = 0.2c
R Bkg β = 200 cpm
C Bkg β = 200c
Eff_α = .42 c/d (Pu-239)
$S_{b\alpha}$ = 0.45
Eff_β = .50 c/d (Sr-90)
$S_{b\beta}$ = 14.14

$$LLD_\alpha = \frac{3 + (4.65)(S_b\alpha)}{(Eff_\alpha)(T)}$$

$$= \frac{3 + 4.65(0.45)}{(0.42)(1)}$$

14.14 dpm per probe area

$$LLD_\beta = \frac{3 + 4.65(S_b\beta)}{(Eff_\beta)(T)}$$

$$= \frac{3 + 4.65(14.14)}{(.50)(1)}$$

=138 dpm per probe area

LLDs for Scanning Uniformly Distributed Sources of Surface Radioactivity

LLDs for uniformly distributed sources are expected to approach those of the minute static counts. Brown and Root Environmental will also instruct technicians to perform a static 1 minute count if increased count rate is detected.

LLDs for Scanning Point Sources of Surface Radioactivity

Width of probe = 5 cm
Assume Scanning Speed = 3 cm/sec
Time for Probe to Pass Over Point Source = 1.67 sec = .028 min

LLD α Point Source Scan

$$C_{bkg} = \frac{0.2c}{\min} \times 1.67\sec \times \frac{1\min}{60\sec} = 0.0056C$$

$$S_b a = \sqrt{C_{Bkg}}\, a = \sqrt{0.0056} = 0.07$$

$$\frac{3 + 4.65(0.075)}{.42(0.028)} = 284\text{dpm} = 290\text{dpm}$$

= 284 dpm = 290 dpm

LLD β Point Source

$$C_b = \frac{200c}{\min} \times 1.67\sec \times \frac{1\min}{60\sec} = 5.56C$$

$$S_b\beta = \sqrt{C_b}\,\beta = \sqrt{5.56} = 2.36$$

$$T = 1.67\sec \times \frac{1\min}{60\sec} = 0.028\min$$

$$\frac{3 + 4.65(2.36)}{.5 \times (0.028)} = 998\text{dpm} = 1000\text{dpm}$$

Many assumptions are made when estimating the LLD for detection of a point source of surface radioactivity (i.e., scanning speeds, distance of the probe from the source, background rates, etc.) and all may fluctuate under given field conditions. Based on the above assumptions, the LLDs for the instruments to be used for a point source of surface radioactivity are approximately 290 dpm (alpha) and 1000 dpm (beta). Both activity levels are less than the most restrictive "maximum" values given in Table 1.

TELEPHONE CONVERSATION LOG

PERSON CALLED:	ORGANIZATION:	TELEPHONE NUMBER:
Dr. Ed David and Dennis Beisel of Brown & Root	Ronson Metals Corporation	908-234-9319
LICENSE NUMBER:	**DOCKET NUMBER:**	**MAIL CONTROL NUMBER:**
STB-1451	040-08843	121068

PERSON CALLING:

Steve W. Shaffer (610) 337-5256
USNRC Region I FAX Numbers
475 Allendale Road (610) 337-5269 or
King of Prussia, PA 19406 (610) 337-5393

SUBJECT: Deficiency response dated December 16, 1996.

SUMMARY:

Please provide the following information:

1. Item 1 paragraph 2, of your response references certain safety related procedures. These procedures must be provided.

2. Item 2 discusses the use of air monitoring equipment. Please provide a specific commitment as to when air sampling shall be performed, when it will be analyzed, and the concentration levels that will trigger procedural changes and/or investigations.

3. Please note that the methodology outline in Item 4 of your response will suffice for field characterization during decommissioning work. An radioisotopic analysis shall be required for your final site status survey.

4. Please confirm that the initials of the individual performing the surveys referenced in item 7 of your response shall be added to the survey documentation.

5. Item 9 appears to be a cursory summary/outline of your final site survey plan. No determination of its adequacy can be determined from the information provided. If you wish to have this survey plan approved please submit a detailed survey plan.

6. Item 12 discusses the use of a Ludlum Model 2929 for soil sample analyses. This would only be capable of gross counting. This method of analysis will require your cut off concentration to be five picocuries per gram, the limit for radium-226, unless a specific area sampling was performed to determine an accurate concentration ratio for all contaminates.

ACTION REQUIRED/TAKEN: MILESTONE 15

SIGNATURE: SWS

Steve W. Shaffer

DATE: January 21, 1997

ML 10

(908) 234-9319

FAX (908) 234-2956

MS16
J5

EDWARD E. DAVID, INC.
P.O. BOX 435
1250 LAMINGTON ROAD
BEDMINSTER, NEW JERSEY 07921

EDWARD E. DAVID, JR.
PRESIDENT

December 16, 1996

Mr. Steve Shaffer
Health Physicist
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Concerning: License No. STB-1451
Docket No. 040-08843
Control No. 121068

Dear Mr. Shaffer:

Attached are Ronson's responses to your request of November 18, 1996 for further elaboration of our Decommission Plan (Bldg. #7 and Areas E and F). The items are numbered keyed to the comments in your letter.

Sincerely,

Ed David

Edward E. David, Jr.

EED:dw
Attachment

DEC 18 1996

Attachment to Dr. Edward E. David's letter of December 16 to Mr. Steve Shaffer of the U.S. NRC

Response by Dr. Edward E. David on behalf of RMC to NRC Comments on the RMC Building 7, Areas E & F Decommissioning Plan

Item 1

The specific procedures for the decontamination of the floor area of building 7 are held proprietary by the vendor (Icesolv) and will primarily address the operation of their abrasive blasting equipment. These procedures are attached.

Procedures for personal air sampling (lapel), area air sampling (low volume samplers), performance of radiation and contamination surveys will be provided. The safety controls on the work activities will be presented in the Site Specific Health and Safety Plan which will also include the actions to ensure worker protection during the excavation and packaging of the small quantity of soil in Area E.

Item 2

Two types of air monitoring will be used for evaluation of the airborne concentrations during the decontamination activities. Lapel air samplers will sample the worker breathing zone and area air samplers will be used to evaluate the general area conditions within the facility. Because of the media recovery system on the abrasive blasting equipment it is not anticipated that airborne radioactivity will exceed 0.1 Derived Air Concentration.

Item 3

All materials generated from the application of abrasive blasting technology will be treated as radioactive waste. This volume has already been considered in the estimated 60 cubic feet of material resulting from the decontamination of Building 7.

Item 4

The proposed NRC method of evaluating a mix of isotopes means that the sum of the ratios of the various contaminant concentrations to their respective release criteria must be less than unity in order to qualify for unrestricted release. The contaminated soil in Area E will be excavated to a value reflecting release level of 10 picocuries/gram total thorium and 5 picocuries/gram of Ra226. This will be accomplished by excavating to a level reflecting the sum of ratios of the nuclides found at

the excavated areas; gross alpha radiation as measured in the field will be the measured quantity.

Item 5

All instruments used for the decontamination activities are leased from GTS Instrument Services, 2045 Route 286, Pittsburgh, PA, Telephone # (412) 733-1900. The instruments are received in the field already calibrated to sources traceable to the National Institute for Standards and Technology (NIST) and accompanied by exempt quantity sources to be used for the performance of daily response checks. GTS's NRC License number is #37-28097-01.

Item 6

The Brown and Root respiratory protection program complies with the requirements of 29 CFR 1010.134, ANSI Z88.2, 1992, 10 CFR 20.1703, 29 CFR 1910.001, 30 CFR 11, and NUREG - 0041.

Item 7

Documentation of surveys performed for the evaluation of the worker environment, status of the decontamination efforts, and area habitability will include:

- A drawing or map of the area or component as appropriate
- Type, model and serial number(s) of instruments and detectors used
- Calibration status (when performed, when due for re-calibration)
- Results of daily functional tests
- Printed name and signature of the individual reviewing the survey for accuracy and legibility
- Description of activity or purpose for survey (special, daily, etc.)
- Calculated minimum detectable activity as appropriate

These records shall be maintained by Brown & Root Environmental and by RMC until the entire site has been released by the NRC.

Item 8

All containers of radioactive waste will be packaged and labeled in accordance with the requirements of 10 CFR Parts 20 and 71. Additionally, prior to shipment for disposal, all containers will be manifested and placarded in accordance with the requirements of the Department of Transportation.

Item 9

Conduct of Surveys and Sampling

1. Reference Grid System - The radiological measurements and samples will be collected relative to a grid system that has been prepared for the areas. It should be noted that the grids described are intended primarily for reference purposes and do not necessarily dictate the spacing of radiological survey measurements or sample. Closer spaced or other variously described survey locations may be required to demonstrate that average and hot-spot guidelines are met to the necessary level of confidence. The grid system is established to:

- facilitate selection of systematic measuring/sampling locations,
- provide a mechanism for referencing a measurement/sample back to a specific location so that the same survey point can be relocated, and
- provide a convenient means for documenting average radioactivity levels.

The system is established in reference to a fixed facility location or bench mark. Typical grid systems consist of mutually perpendicular lines spaced at equal intervals dividing the survey area into blocks of equal area. The intersections of these lines are referred to as grid points. The grid area is the functional unit used for making comparisons with guideline values and to assess the adequacy of remedial action.

A drawing of the grid system will indicate the grid, facility boundaries, and other pertinent site features and provides a legend showing the scale and reference compass direction.

The grid area considered appropriate for outdoor surveys is 100 ft2. The grid size may be increased or decreased depending on the potential for contamination, size of the area to ensure statistically accurate representation of the area, facility layout, and the type of survey being performed.

2. Grid Marking and Grid Point Identification - The grid will be laid out on the property and field-marked using stakes, hubs, spikes, paint, flags, or survey tape. The selection of an appropriate marker is based on the characteristics and routine uses of the surface.

Two basic coordinate systems will be used for identifying points on a grid system. The grid system may reference distances from 0,0 point using the compass directions N (north), S (south), E (east), W (west). The other system may reference distance along and to the R (right) or L (left) of the baseline.

3. Radiation Measurements (Characterization)

A. Scanning - Scanning surveys are performed to locate and define the areal extent of radiation anomalies indicating residual gross radioactivity or hot-spots that will indicate the necessity for further investigation or action.

The surveyor will use portable radiation detection instrumentation for detecting the presence of elevated radiation levels on a specific surface.

B. Systematic Measurements and Samples - Using the established grid system, discrete radiological measurements or samples may be taken at systematic locations (e.g., at grid points and/or the center of grid blocks, or random points per grid block or blocks). These measurements or samples provide definitive radiation levels at precisely defined locations. The measurements also allow for the calculation of average radiation levels within a given area for purposes of comparison with other areas, background samples, or to estimate potential health effects to people occupying that area. Systematic measurements may include alpha, beta, beta-gamma, low-energy x or gamma radiation. Samples typically include surface and sub-surface soil samples and routine evaluations for transferable surface contamination. All measurement locations and results are recorded. Additionally the collection of core drilled samples though the concrete slab will be performed to evaluate the migration of contamination through stress cracks in the slab. The collection point of these samples will be determined by the radiation and contamination levels observed during the performance of the scanning survey and visual evidence of materials spills.

C. Biased Measurements and Samples - Biased radiological measurements may be taken ("biased" indicates that the locations are not chosen on a random or systematic basis) at locations where anomalous radiation levels are observed. The purpose of these measurements and samples are to further define the areal extent of potential contamination and to determine the maximum radiation levels within an area. These measurements may include alpha, beta, beta-gamma, low-energy x or gamma radiation, and may also be supplemented with other types of atypical measurements such as radon flux or gamma spectroscopic measurements. Air, water, soil and transferable contamination samples may typically be taken at these locations; samples of vegetation or sediment may be appropriate. All sample and measurement locations and results are recorded.

Sampling and Analysis

Required Equipment

Instruments and samplers:

Ludlum Model 19 survey meter
Ludlum Model 12 with Ludlum Model 44-9 GM detector
Ludlum Model 12 with Ludlum Model 43-5 Alpha detector
Low Volume Air Sampler
Label Air Sampler (one for each worker in the contaminated area)
High Volume Air Samplers
Ludlum Model 2929 Sample Counter with Ludlum Model 43-10-1 Alpha and Beta detector

Protective Clothing (as required)

Coveralls
hood
Gloves
Shoe covers
disposable booties

Respiratory Protection Equipment

One air purifying respirator (HEPA filter cartridge) per worker if the area becomes an airborne radioactivity area.

Laboratory Analytical Support

- Radium-226, Thorium-232, Thorium-228 (criteria for screening these samples using the Ludlum 2929 will be established and this analysis will be required only if gross Alpha or beta-gamma activity is above a predetermined level).

Gross alpha and beta-gamma measurements may be determined using the Ludlum Model 2929 by onsite health protection personnel.

Area Control Equipment

If required, signs:

- Contamination Area

- Airborne Radioactivity Area
- Radiation Area

If needed, yellow and magenta barrier rope or ribbon.

Item 10

All isotopes in the areas of concern have been identified in the site characterization program, therefore the criteria as presented in Table 1 of the decommissioning plan will apply in all cases by isotope. Additionally, areas will not be released based solely on beta decay measurements, therefore the 670 disintegrations per minute averaged over 100 square centimeters will not be used. We have only used this criteria in the past when it was necessary to release materials or equipment and the surfaces were damp and the alpha emissions were shielded by the moisture. We do not anticipate this situation at Manufacturers Place.

Item 11

The instruments to be used are described in the response to Item 9. The minimum Detectable Activity (MDA) will be determined based on the documented efficiency of the specific instrument using the described methodology. The MDA will be evaluated daily and documented as part of the survey/sampling records.

Item 12

Soil samples will be evaluated using the Ludlum Model 2929 configuration described in response to Item 9. A maximum 10% samples which indicate a gross alpha activity in excess of 10 pCi/g will be sent to an independent laboratory for analysis. A 10% split will be performed with the NRC if required

IceSolv, Inc.

PROCESS PROCEDURE

ISI - 110

Concrete Scarifier

Reviewed: William E. Bergin 11/22/96
Chief Operating Officer Date:

Reviewed: Paul L. LeBlanc 11/22/96
President Date:

ISI PROPRIETARY INFORMATION

1.0 SCOPE

Provide a mechanism for decontaminating a concrete floor using Scarifying equipment.

2.0 Definitions

2.1 PPE - Personal Protective Equipment.

2.2 HEPA Vac - High Efficiency Particulate Air Vacuum.

2.3 Scarifier - Coating and Concrete removal.

3.0 References

3.1 Equipment Manufacturers Literature

4.0 Procedure

4.1 Initial Conditions

4.1.1 Floor area must be free of obstructions e.g. movable machinery.

4.1.2 Free standing water must be removed prior to start.

4.1.3 All loose debris must be removed. e.g. wood, trash, cords and excessive dirt.

4.1.4 Electrical outlets must be available and or ample air supply.

4.1.5 Sufficient overhead lighting.

4.1.6 Verification that Scarifier, HEPA Vac and ventilation are operational.

4.1.7 Proper precondition reports are supplied to IonSolv, Inc. personnel.

4.1.8 Proper PPE is available prior to start.

4.1.9 Personnel are qualified to perform task.

4.1.10 Approved waste containers in sufficient quantities to handle all waste.

4.2 Scarifying Floors

4.2.1 Surveys must be reviewed to verify where the highest contamination areas are located.

4.2.2 Connect the HEPA VAC hose to the Scarifier system prior to starting.

4.2.3 Stage waste containers for easy transfer of waste from the vacuum.

4.2.4 Properly Don all PPE.

4.2.5 Keep the Scarifier cutters above the surface to be cleaned while energizing the system.

4.2.6 Energize the vacuum prior to starting of the Scarifier.

4.2.7 Energize the Scarifier and slowly move the system over the surface to be cleaned.

4.2.8 Stop Scarifier and deenergize after doing a very small area so that a survey may be taken to see if you are obtaining the desired results.

4.2.9 If desired results are not obtained repeat steps 4.2.7 and 4.2.8 until the area to be cleaned is free of all contaminants.

4.2.10 Have the contaminated area surveyed and released by the customer prior to the removal of any equipment.

4.3 Following the Decontamination Process and Post Decontamination Surveys.

4.3.1 After verification that the area is cleared of all contaminants. Survey all of the equipment to verify that it is radiologically and chemically free released. Properly store it in a clean dry secured area for return to the IceSolv, Inc. Office.

4.3.2 Have the customer or their approved representative sign off the job as complete and acceptable

5.0 Exceptions None

6.0 Attachments None

121068

NOV 18 1996

License No. STB-1451
Docket No. 040-08843
Control No. 121068

Daryl Holcomb, Chief Financial Officer
Ronson Metals Corporation
Corporate Park III - Campus Drive
P.O. Box 6707
Somerset, New Jersey 08875-6707

Dear Mr. Holcomb:

This is in reference to your submission dated November 1, 1996, transmitting your decommissioning plan for portions of the Ronson Metals Corporation facility in Newark, New Jersey, License No. STB-1451. In order to continue our review, we need the following additional information:

1. Section 2 of the RONSON Decommissioning Plan for Building 7, Area E and Area F (Plan) covers the scope of decommissioning activities. The Plan does not include any specific procedures for the expected decontamination activities. Please provide procedures for the expected decontamination activities. These procedures should also include the safety precautions to be taken and radiological monitoring that will be required during these activities.

2. The activities outlined in Section 2 could possibly create airborne exposure hazards. Please provide a detailed description of the air monitoring to be performed during the decontamination activities.

3. Section 2.1.2 of the Plan discusses the vacuuming and the abrasive blasting of the floor of the building. Please confirm that all vacuumed material and byproducts of the abrasive blasting shall be disposed of as radioactive waste.

4. Section 3.2 of the Plan states, in part, that only soil with concentrations greater than 10 picocuries per gram of thorium shall be removed. The release criterion of 10 picocuries per gram for thorium (above background) assumes that thorium-232 is in equilibrium with its daughter thorium-228. Please confirm that soil cleanup shall be done to the criteria of five picocuries per gram of thorium-232 and thorium-228, respectively.

OFFICIAL RECORD COPY ML 10

Past sampling at the site has demonstrated that radium-226 is also a contaminant at this site. The soil concentration criterion for radium-226 is five picocuries per gram. If radium-226 and thorium are both present then the criterion for release should be the sum of their individual activities divided by their individual criterion. Please confirm that cleanup shall be done to these criteria.

5. Section 3.3 of the Plan discusses the calibration of survey equipment. Describe your instrument calibration procedure. If you intend to contract out the calibration of your instruments, you only need to specify the name of the firm and the license number that authorizes the firm to perform calibration services. If you elect to calibrate your survey meters yourself, please submit the information described in "Guide for the Preparation of Licenses for the Use of Radioactive Materials in Calibrating Radiation Survey and Monitoring Instruments" (Task FC 413-4)(enclosed).

6. Section 3.3 of the Plan discusses the use of respirators. Please confirm that you have a respiratory protection program that meets the requirements of 10 CFR 20.1703.

7. Section 3.3 of the Plan states, in part, that surveys shall be performed on a regular basis. Please provide a description of the records that shall be kept of the surveys performed. The records should include the initials of the individual who performed the survey, the instrument and probe used including serial numbers and the date of the survey. Also, confirm that these records shall be maintained until the entire site has been released by the NRC.

8. Section 3.5 of the Plan discusses radioactive waste management and states that all packages shall be properly packaged and labelled. Please confirm that your packaging and labelling shall be in accordance with the NRC's requirements in 10 CFR Parts 20 and 71.

9. Section 4 of the Plan summarizes your final radiation survey methodology. Please provide more detailed information describing the final survey methodology. Include survey frequencies for the different areas, both affected and unaffected, and the soil sampling plan for areas E, F, and the holes in the floor of building 7.

10. Table 2 in Appendix C of your Plan summarizes your intended release limits for activities when the isotope(s) of origin are unknown. In cases where the isotope(s) of origin are unknown, the most limiting criteria must be used or sampling must be done to determine the source of radioactivity. Also, please note that the thorium criteria, although not clearly stated in our guidance, is the alpha particle activity. Therefore, for contamination that was purely thorium, and measured via beta decay, the criterion should be 670 disintegrations per minute averaged over 100 square centimeters. Your table also appears to use the maximum allowable criteria for radium-226 as your basis for your release criteria. The average criteria should be used for the basis of general release criteria. The maximum release criteria should only be used as basis for spot or small area criteria. Please resubmit Table 2 with your revised release criteria.

11. Appendix C of the Plan discusses the method you are using for your minimum detectable activity (MDA) calculations. Please provide a description of each survey instrument/probe combination and your MDA calculation for each combination.

12. Appendix C of the Plan does not address analysis of soil samples. Describe how you intend to have your soil samples analyzed and the number of split samples that will be analyzed by an independent laboratory under your quality assurance program.

We will continue our review upon receipt of this information. Please reply in duplicate to my attention at the Region I Office and refer to Mail Control No. 121068. If you have any technical questions regarding this deficiency letter, please call me at (610) 337-5256.

In order to continue prompt review of your application, we request that you submit your response to this letter within 30 calendar days from the date of this letter.

Sincerely,

Original Signed By:
Steve W. Shaffer

Steve W. Shaffer
Division of Nuclear Materials Safety

License No. STB-1451
Docket No. 040-08843
Control No. 121068

Enclosures:
1. 10 CFR Parts 19, 20, 40, and 71
2. Guide for the Preparation of Licenses for the Use of Radioactive Materials in Calibrating Radiation Survey and Monitoring Instruments (Task FC 413-4)

OFFICIAL RECORD COPY

cc:
State of New Jersey

Jeffery A. Walder, Attorney for RMC
Walder, Sondak & Brogan, P.A.
5 Becker Farm Road
Roseland, New Jersey 07068

DOCUMENT NAME: C:\TYPING\ORNL\RONSON\DECON.DEF
To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy

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NAME	SShaffer SWS		RBellamy					
DATE	11/18/96		11/19/96		11/ /96		11/ /96	

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(908) 234-9319

FAX (908) 234-2956

EDWARD E. DAVID, INC.
P.O. BOX 435
1250 LAMINGTON ROAD
BEDMINSTER, NEW JERSEY 07921

EDWARD E. DAVID, JR.
PRESIDENT

040-08243
STB-1451

November 6, 1996

Mr. Steve Shaffer
Health Physicists
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Dear Mr. Shaffer

Enclosed are three (3) copies of Ronson Metal's Decommissioning Plan as we discussed by phone yesterday. We would appreciate a fast response so the remediation can begin promptly.

Sincerely,

Edward E. David Jr.

Edward E. David, Jr.

EED:dw
Enclosure

RONSON®

Decommissioning Plan

040-08843
STB-1451

For

Building 7, Area E, and Area F

Prepared for

Ronson Metals Corporation
55 Manufacturer's Place
Newark, New Jersey

November 1, 1996

RONSON®

Decommissioning Plan

For

Building 7, Area E, and Area F

Prepared for

Ronson Metals Corporation
55 Manufacturer's Place
Newark, New Jersey

November 1, 1996

DECOMMISSIONING PLAN
FOR
BUILDING #7, AREA E & AREA F

RONSON METALS CORPORATION, INC.

NUCLEAR REGULATORY COMMISSION
LICENSE NUMBER STB-1451

TABLE OF CONTENTS

List of Figures

1.0 GENERAL INFORMATION

This decommissioning plan is for a portion of the Ronson Metals Corporation facility with the primary address located at 55 Manufacturers Place, Newark, New Jersey. This plan is submitted under the requirements of Title 10, Part 40.42, *Expiration and Termination of Licenses,* to specifically address the decontamination of Building #7, Area F adjacent to Building #7, and Area E adjacent to Building #5 all shown on Figure 1.0.

2.0 DESCRIPTION OF PLANNED DECOMMISSIONING ACTIVITIES

The decommissioning activities described in this amendment address the removal of low-level radioactive contamination from Building 7, and Area E. Area F has been evaluated by Brown & Root Environmental and the Nuclear Regulatory Commission and found to be within the criteria for unrestricted release as provided for in the Branch Technical Position as published in the Federal Register. Based on the evaluation of this data, no remedial actions are required in Area F for the removal of radioactive contamination.

The results of the Brown & Root Environmental August, 1996 on-site radiation survey of building surfaces and laboratory analyses of the soil/fill samples are included in Appendix A. Results of previous surveys were reported in the May 28, 1996 *Final Radiation Survey for Building #7.* No concentrations exceeding the release criteria of 10 picocuries/gram were found in the soil/fill beneath the building floor or in soil collected in Area F. All direct measurements of fixed contamination on the ceilings, walls, and roof beams were below the NRC release criteria of 1000 dpm/100 square cm for fixed alpha for isotopes of thorium and 5000 dpm/100 square cm fixed beta/gamma. Likewise, all field measurements for removable contamination were below the NRC release criteria of 200 dpm/100 square cm removable alpha and 1000 dpm/square cm removable beta/gamma.

Samples of concrete core were obtained from two locations from the floor in Building #7. The upper portion of one core indicated a Th228 concentration above 10 picocuries/gram with no other elevated radioisotopes. The bottom portion of the core had negligible concentrations indicating the fixed contamination was limited to the upper 1/2 inch of concrete. Results of the core samples are shown in Appendix A as samples numbered B7-C-001T, B7-C-001B, B7-C-002T, and B7-C-002B (12 samples in all).

Field screening data from the soil samples taken beneath the cores are shown in Appendix A as samples B7-CD-001 and B7-DC-002. The soils also contain negligible concentrations of radioisotopes.

One soil sample from Area E, taken from the surface next to the outside wall of Building #5, indicated Radium 226 and Thorium 228 values exceeding 10 picocuries/gram.

2.1 Decommissioning Objective

The objective of the planned decommissioning activity is to remove identified radioactive contamination in Building 7, and Area E, and obtain the release of Building 7, Area E, and Area F from the constraints of the license.

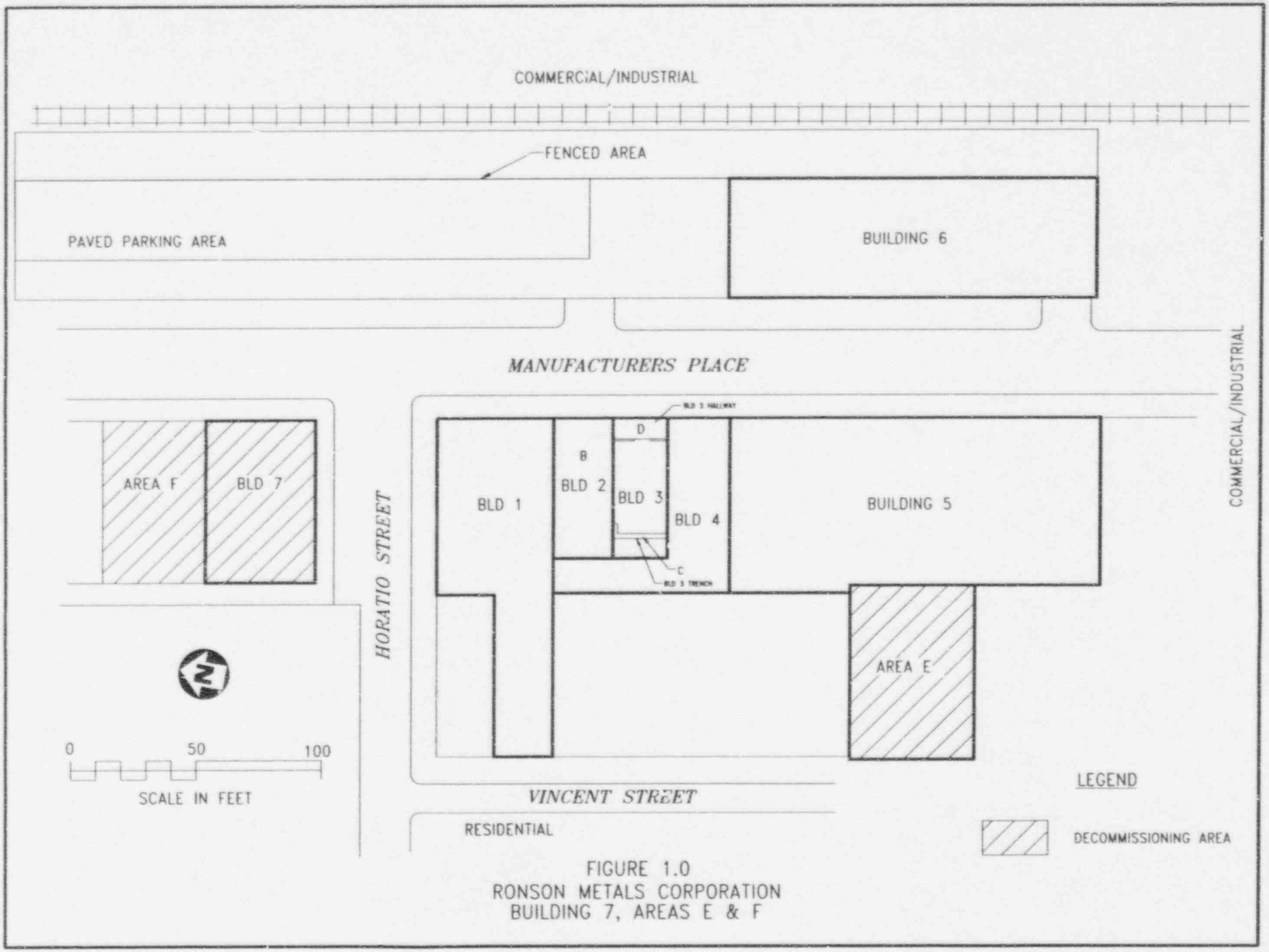


FIGURE 1.0
RONSON METALS CORPORATION
BUILDING 7, AREAS E & F

2.1.1 Decommissioning Activities

The activities associated with the decommissioning range from simple cleanup of loosely bound contamination to the more aggressive removal of contamination held tightly within the matrix of the contaminated material, which in the case of Building #7 is the concrete floor.

Decontamination may be achieved by vacuuming loose contamination using a vacuum equipped with a High Efficiency Particulate Aerosol (HEPA) filtered exhaust, or, more aggressively, by the removal of surface materials by abrasive blasting or actual removal of concrete by breaking with a jack hammer. Packaging and storage of radioactive waste materials prior to disposal is also included. Off-site disposal of Building #7 waste materials will be done in conjunction with disposal of waste material from future decommissioning of the remainder of the site. Temporary storage of the Building #7 waste material will be in a staging area in Building #1.

2.1.2 Decommissioning Tasks

Building 7

Building 7 has been evaluated and the radioactive contamination to be removed is limited to the upper surface of the concrete flooring. Cores were removed from the floor and material was removed from the upper surface and the lower portion of the core which was in contact with the sub-surface soils. This material was analyzed and it was determined only the upper surface was contaminated with one concrete sample exceeding 10 picocuries/gram of Th228 in the top 1/2 inch of core.

Based on the results of surveys performed by the NRC and testing performed by Brown & Root Environmental on the contaminated surfaces of Building #7, the most efficient and cost-effective method for the removal of contamination from the concrete floor is abrasive blasting.

Prior to commencing the abrasive blasting, the building surfaces will be vacuumed using a High Efficiency Particulate Aerosol (HEPA) filtered vacuum cleaner to remove any loose materials from the floor and horizontal surfaces. In conjunction with this activity, any loose material or objects remaining in the building will be removed and radiologically surveyed for proper disposition. A portion of the Building #7 roof will be temporarily sealed with a tarp to prevent precipitation from leaking in and pooling on the floor.

Area E

Area E has been evaluated by the collection of surface and sub-surface soil samples and conducting general area radiation surveys. One area of elevated readings has been identified adjacent to Building 5.

The contaminated soil in this area will be excavated manually, placed in a 55 gallon drum, and staged in Building #1 for future disposal.

Area F

Area F requires no remedial actions.

2.1.3 Procedures

Contracted decommissioning activities and tasks will be performed under the direction of written procedures or plans provided by the Vendor. These procedures and plans will be reviewed and approved by the licensee's remedial action contractor, Brown & Root Environmental.

2.1.4 Schedule

The remediation of Building #7 and Areas E and F and the process of obtaining a release from license constraints for these areas and building is anticipated as follows:

- Date to begin scheduled work - December 2, 1996
- Date field work complete - December 7, 1996
- Estimated date of NRC verification surveys/inspection - December 28, 1996

2.2 Decommissioning Organization and Responsibilities

The contact for the licensee is Daryl Holcomb of Ronson Metals Corporation. All decommissioning activities will be directed by Brown & Root Environmental under contract to the licensee. Brown & Root Environmental's project manager for the decommissioning is Dennis Beissel and the Health and Safety Officer is Dwaine Brown. Both resumes are included in Appendix B.

2.3 Training

Records reflecting training and certification in accordance with OSHA and other regulatory requirements are maintained by Brown & Root Environmental and the subcontractor responsible for decommissioning.

3.0 DESCRIPTION OF METHODS USED FOR THE PROTECTION OF OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY

3.1 Facility Radiological History Information

Ronson Metals Corporation used natural Thorium for the manufacture of vacuum tube "getters" between 1978 and 1982. The powdered thorium was applied to nickel strips using ceralloy paste in Laboratory C. The coated strips were transferred to a vacuum furnace in the NE corner of the extrusion area for heat treating. The QA Laboratory was used for the analysis of samples for quality assurance purposes. Levels of contamination during these operations are unknown.

Based on the available facility history, none of these activities were conducted in the areas addressed by this decommissioning plan.

3.2 Ensuring that Occupational Radiation Exposures are Maintained As Low As Reasonably Achievable (ALARA)

Administrative and engineering controls will be the primary methods used to control exposures to the workers and the general public. The licensee's contractor, Brown & Root Environmental will be responsible for all Health and Safety compliance issues on site during the decommissioning activities conducted under their supervision. Within that organization, Dwaine Brown will be responsible for

Health Physics, Industrial Hygiene, and Industrial Safety. The control of contamination for this project will be achieved by the containment of loose contamination as quickly as possible and the use of locally filtered ventilation. Soil removal will be performed only on damp soil and only soil with uranium or thorium concentrations exceeding 10 picocuries/gram will be removed.

3.3 Health Physics Program

Instrumentation has been selected and will be used such that the minimum detectable activity is well below the release criteria for this project. The probes used with the selected survey instruments will have a response range that will encompass the energy range for the emissions from the contaminants of concern.

All instruments will have been calibrated within the past 12 months to NIST traceable standards and field response checked prior to use each day. All instrument calibration and response check data will be recorded and maintained as part of the decommissioning record.

When necessary, workers will be provided with personal protective equipment consistent with the degree of protection required for the degree of hazard. Facility personnel not involved with the remedial actions will be prohibited from the immediate areas of the remedial actions.

Air purifying respirators will be used for the protection of personnel when work activity involves the potential for airborne radioactive contamination. Involved personnel will be monitored by the use of breathing zone air samplers.

Routine radiation and contamination surveys will be performed in the work area to monitor personnel exposure and the progress of the remedial action.

All contaminated waste and material generated as a result of the remedial action will be packaged, surveyed, and stored in Building #1 until it is disposed of appropriately with material from the future decommissioning of the other RMC buildings and lots on the site.

3.4 Contractor Personnel

All decommissioning activities on-site will be under the direction of Brown & Root Environmental. Ronson Metals Corporation personnel will not be used for any activities conducted inside active remedial action areas. Brown & Root Environmental will use their company Health and Safety Procedures, a site specific health and safety plan (HASP) and follow the company's safety policy for this project. Brown & Root Environmental will ensure the proper training of all subcontractors. Subcontractors will be required to read and comply with the site specific HASP and sign a statement affirming that they have read and understand, and will comply with the requirements set forth in the HASP.

3.5 Radioactive Waste Management

All waste from the remedial actions will be temporarily stored in Building 1. Department of Transportation Specification 17H steel drums will be used to store dry active waste and any liquid waste generated will be poured over absorbent material contained in the 17H drums, no free standing liquids will be stored in drums.

Wastes from the decontamination of Building 7 and area E will be retained on site, properly packaged and labeled, until such time as the remainder of the site is remediated and all waste transported to a licensed disposal facility.

4.0 PLANNED FINAL RADIATION SURVEY

Using the methods specified in NUREG/CR 5849, *Manual for Conducting Radiological Surveys in Support of License Termination*, the licensee shall perform surveys capable of detecting the levels of contamination specified in USNRC Regulatory Guide 1.86, *Termination of Operating Licenses for Nuclear Reactors*, for surface contamination, and the USNRC Branch Technical Position for soils as published in the Federal Register, Volume 46, Number 205, Friday October 23, 1981, *Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations*. These criteria are presented in the following table.

ACCEPTABLE SURFACE CONTAMINATION LEVELS			
NUCLIDE[a]	AVERAGE[b, c]	MAXIMUM[b, d]	REMOVABLE[b, e]
U-nat, U-235, U-238, and associated decay products	5,000 dpm α/100 cm^2	15,000 dpm α/100 cm^2	1,000 dpm α/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm^2	3000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm/100 cm^2	15,000 dpm/100 cm^2	1000 dpm/100 cm^2

[a]Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[b]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.

[c]Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each object.

[d]The maximum contamination level applies to and area of not more the 100 cm^2.

[e]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. When removable contamination on objects of less surface is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

Background measurements of surface contamination surveys will be obtained from a clean surface in an unaffected area. Gamma exposure rate background will be obtained outdoors at the north end of Manufacturers Place near Ferry Street. Soil background data for the region has been obtained at the north and south ends of Manufacturers Place, inside the abandoned building adjacent to Building 5, and at the SE corner of the intersection of Horatio Street and Vincent Street.

The minimum detectable activity for the field instrument has been documented in the Technical Basis Document for Ronson Metals Facility Release Criteria which is provided as Appendix C.

The minimum detectable activity for bench top radiation counting equipment will be determined on a daily basis and documented on the analytical data sheets.

5.0 FUNDING

Funding for the decommissioning of Building #7, area E and area F will be provided to Ronson Metals Corporation by Ronson Corporation through their basic services agreement with Brown & Root Environmental.

6.0 PHYSICAL SECURITY PLAN AND MATERIAL CONTROL AND ACCOUNTING PLAN PROVISIONS IN PLACE DURING DECOMMISSIONING

Physical security will be provided by Ronson Corporation during the Building #7 decontamination work. The building has locked doors where equipment can be stored overnight. Access is limited to approved site personnel only. All material removed will be under control of the contractor during the removal process. Drummed material will be staged in Building #1 which will also be locked when personnel are not present.

APPENDIX A

Survey Results

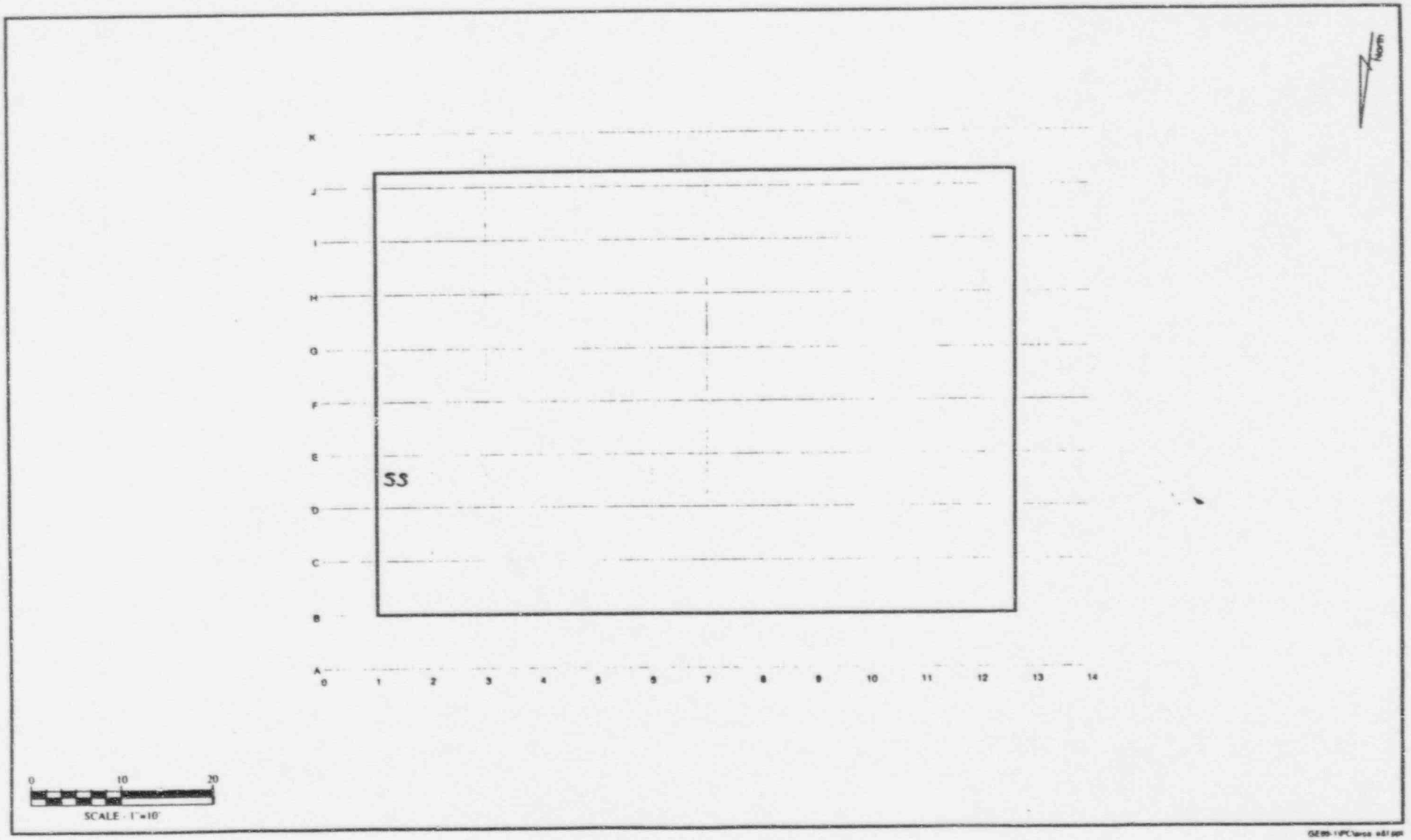
Area/Building(s): Area E

Location Number	Sample ID	Dose Rate µR/hr	Surface Contamination (dpm/100cm2) α	Surface Contamination (dpm/100cm2) β-γ	Field Screening Data (pCi/g) α	Field Screening Data (pCi/g) β-γ	Lab Analysis Results (pCi/g) Ra-226	Th-228	Th-230	Th-232	U-238	Remarks
12I	E1-SS-002	Bkg.			<2.3	<42.5						
7F	E1-SS-003	3			2.8	<60.0						
9B	E2-SS-002	2			2.8	<42.5						
7E	E2-SS-003	3			<2.3	<60.0						
1D	E3-SB-001	25			<2.3	<42.5						1 meter in depth
9H	E3-SS-001	2			<2.3	<60.0						
6D	E3-SS-001	2			<2.3	<60.0						
11B	E3-SS-001	2			<2.3	<60.0						
4C	E3-SS-002	2			<2.3	<42.5						
2C	E3-SS-003	5			<2.3	<60.0						
9E	E3-SS-004	2			<2.3	<42.5						
10F	E3-SS-004	3			<2.3	<42.5						
4E	E3-SS-004	3			<2.3	<42.5						
1D	E3-SS-005	25			13.1	96.6	28.28	12.98	1.47	2.05	0.36	
5I	E4-SS-001	2			<2.3	<60.0						
6F	E4-SS-002	2			<2.3	<42.5						
4F	E4-SS-003	2			<2.3	<60.0						
2G	E4-SS-004	5			<2.3	<42.5						

Legend: CD - Sub-Floor (soil) SB - Sub-Surface (soil)
FL - Floor SS - Surface (soil)
PS - Paint Sample S - Street
R - Roof

NOTE: Sample with < detectable activity were recorded as < the minimum detectable activity (MDA) value.

* Indicates a direct reading (per 100 cm2)



Ronson Metals Corporation - Area E

Table A-1. Results of Laboratory Analysis of Concrete Samples at Building 7

Client Sample ID	Lab ID	Matrix	Radionuclide	Result
B7-C-001T	9608541-12	Concrete	Th-228	16.10
B7-C-001T	9608541-12	Concrete	Th-230	0.55
B7-C-001T	9608541-12	Concrete	Th-232	0.72
B7-C-001B	9608541-13	Concrete	Th-228	2.19
B7-C-001B	9608541-13	Concrete	Th-230	0.85
B7-C-001B	9608541-13	Concrete	Th-232	1.01
B7-C-002B	9608541-14	Concrete	Th-228	1.24
B7-C-002B	9608541-14	Concrete	Th-230	0.39
B7-C-002B	9608541-14	Concrete	Th-232	0.34
B7-C-002T	9608541-15	Concrete	Th-228	0.26
B7-C-002T	9608541-15	Concrete	Th-230	0.24
B7-C-002T	9608541-15	Concrete	Th-232	0.20

Survey Results

Area/Building(s): Bldg. 7

Location Number	Sample ID	Dose Rate	Surface Contamination (dpm/100cm2)		Field Screening Data (pCi/g)		Lab Analysis Results (pCi/g)					Remarks
		µR/hr	α	β-γ	α	β-γ	Ra-226	Th-228	Th-230	Th-232	U-238	
5M	B7-CD-001				2.3	<59						
5I	B7-CD-002				<2.3	<59						

Legend: CD - Sub-Floor (soil) SB - Sub-Surface (soil)
FL - Floor SS - Surface (soil)
PS - Paint Sample S - Street
R - Roof

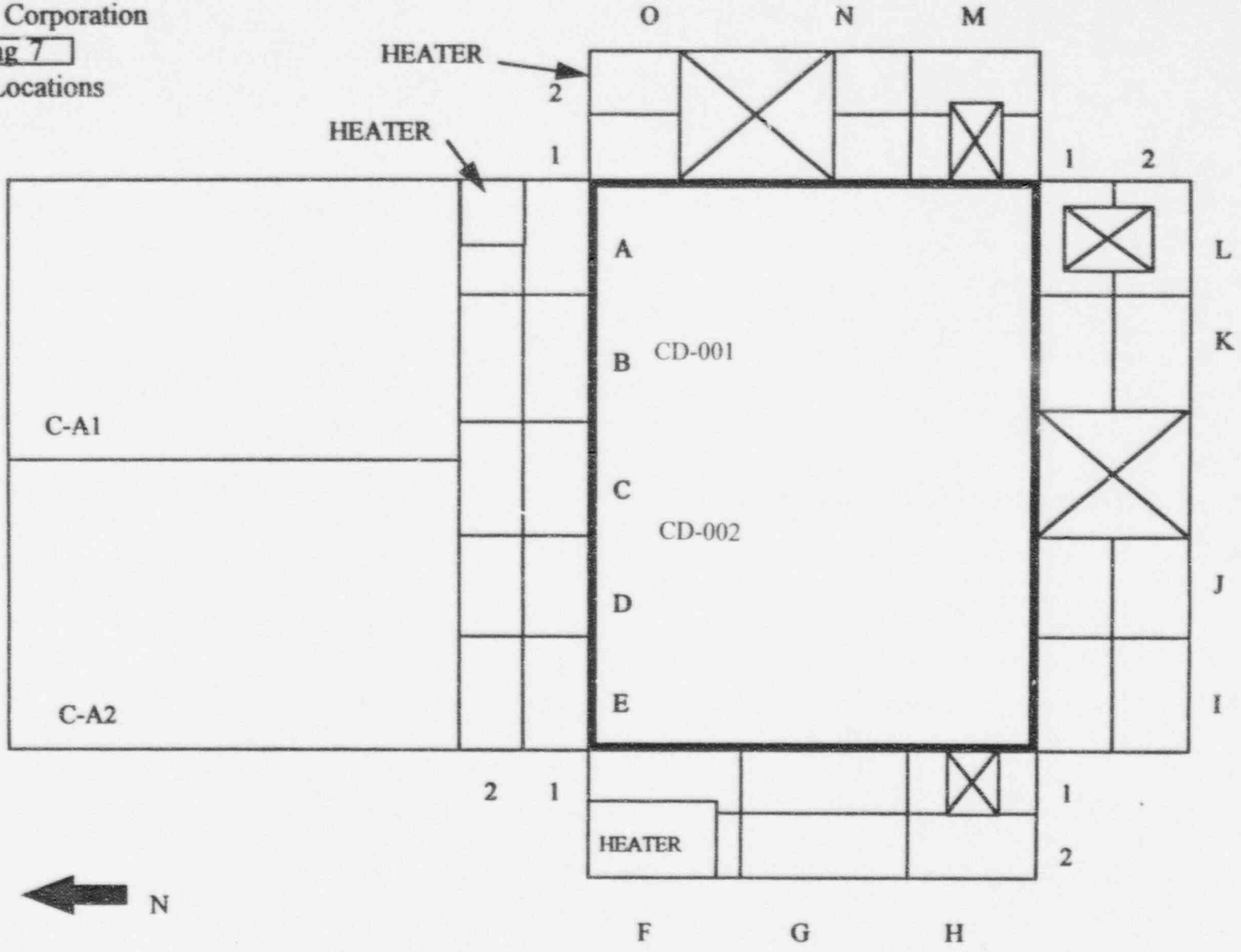
NOTE: Sample with < detectable activity were recorded as < the minimum detectable activity (MDA) value.

* Indicates a direct reading (per 100 cm2)

Ronson Metals Corporation

Building 7

Core Drill Locations



APPENDIX B

RESUME

DENNIS R. BEISSEL
SENIOR PROGRAM MANAGER
EXPERIENCE: BRE - 7YRS; OTHER FIRMS - 20 YRS
EDUCATION: BS-1969-GEOLOGY-UNIV. OF NOTRE DAME
MS-1971-GEOLOGY(HYDROGEOLOGY)-COLORADO STATE UNIV.
REGISTRATIONS: PG-NO.587-COMMONWEALTH OF VIRGINIA
PG-NO.PG-001375-G - COMMONWEALTH OF PENNSYLVANIA
CPG-NO.6050-AMERICAN INST.OF PROFESSIONAL GEOLOGISTS

Project Manager for NRC license closure and site decommissioning for a confidential industrial client in New Jersey. Responsible for planning and controlling the budget and schedule for radiation surveys, soil sampling, radioisotope analyses, site characterization report, and decommissioning plans for closed processing facilities. Assisted the client with scope negotiations with the NRC and in developing presentations to regulators.

Task Order Manager for RCRA Facility Investigation/Corrective Measures Study for Naval Surface Warfare Center, Ordnance Station, Louisville Kentucky for the US Navy CLEAN contract, SouthDiv. Responsible for planning and direction of a $6.1 MM RFI/CMS at a 144 acre conventional weapons refurbushing facility including evaluation and closure of over 50 SWMUs and Areas of Concern. Also serve as active member of Environmental Restoration Management Alliance providing support to the Navy project manager and the Base Closure Team in negotiating the regulatory agreement for base closure.

Project Manager for the Environmental Baseline Survey at the Redstone Arsenal Rocket Engine Facility, Alabama for the Army COE Mobile District. Planned, implemented, and supervised the Phase 1 EBS for this 300 acre former chemical weapons and rocket propellant manufacturing facility in accordance with ASTM E-1527-94 including records review, site reconnaissance survey, air photo evaluation, personnel interviews, and off-site data base searches. A screening matrix was developed with recommendations for Phase 2 sampling and analysis. The EBS was successfully completed on time, on a four month accelerated schedule, and under budget.

Team Leader for an Environmental Baseline Survey at the Naval Ordnance Station, Louisville, Kentucky for the US Navy CLEAN contract, Southern Division. Supervised the evaluation of the environmental condition of process buildings being considered for the US Navy privatization initiative. Actively participated in the Phase 1 visual inspection survey and records search of the 144 acre conventional weapons refurbishing facility which included large machine shops, electronics assembly, plating operations, and waste water treatment. Currently supervising Phases 2 and 3 of the EBS which include sampling, analysis, data management and evaluation of contaminated environmental media.

Project Director for operable units 1 and 3 at the Fernald Environmental Restoration Project, Ohio for the US Department of Energy. As a FERMCO team member, managed and supervised up to 400 personnel and $52 million/yr budget in the remediation, decontamination, and decommissioning of 200 buildings and waste pits at this former nuclear weapons complex facility. Directed the CERCLA and RCRA portions of the remediation of the two operable units including low level radioactive, mixed, and hazardous waste.

Program Manager for the US Bureau of Land Management Hazardous Materials program technical support contract. Conducted technical oversight of RCRA and CERCLA RI/FS projects for active and inactive landfills on Federal leased lands. Planned and implemented PA/SI (Phase 1 & 2 equivalent) investigations for landfills containing hazardous and toxic wastes, prepared RFPs for federal contracts, and served as senior technical advisor to the BLM hazardous materials group.

Project Manager for hazardous waste investigations for many commercial clients with a wide range of industrial facilities including pesticide, paint and adhesive coating manufacturing plants, crude oil and asphalt refineries, and general chemical plants. Developed and implemented RCRA Facility Investigations/Corrective Measures Studies for solid and hazardous waste management units including disposal pits, ponds, sumps, and other impoundments, landfills, drum storage areas, hazwaste accumulation areas, incinerators, sewer and utility systems.

D. Dwaine Brown, RRPT

4031 Glenside Lane
Aiken, SC 29803
(803) 649-7963 (work) (803) 649-5960 (home)

SUMMARY

- Project Management
- Major Production Facility Startup
- Government Consulting
- Major Decommissioning Project Management
- NRC License Renewal
- Program Management
- Commercial Nuclear Experience
- Marketing/Business Development
- Facility Equipment Design
- NRC License Termination

EDUCATION

B.S. Nuclear Technology, University of the State of NY

ADDITIONAL TRAINING

- DOE Cost Schedule Control System
- Contract Administration
- Radioactive Hot Particle Seminar
- Quality Assurance Awareness
- Business Ethics
- RCRA, CERCLA
- Hazardous Waste Site Worker Training
- Hazardous Waste Site Operations, Awareness Level
- Hazardous Waste Site Operations, First Responder/On-Scene Commander
- SARA hazardous materials regulations.

REGISTRATIONS/CLEARANCES

1994, DOE "Q" Clearance (Active)
1993, National Registry of Radiation Protection Technologists

EXPERIENCE

6/93 to Present — **Halliburton NUS Corporation,** Aiken, SC
10/96 to Present - **Environmental Project Manager/Safety Officer**
9/94 to 10/96 - **Executive Health Physicist/ Safety Officer**
6/93 to 9/94 - **Senior Health Physicist**

1/90 to 5/93 — **RUST Geotech, Inc.,** Grand Junction, CO
Contractor for a major DOE environmental restoration project.
4/92 to 5/93 - **Manager Radiation Protection Programs**
1/90 to 4/92 - **Principal Health Physicist**

12/87 to 1/90 — **Illinois Power Company, Clinton Power Station,** Clinton, IL
A commercial nuclear station consisting of a single 970 Mwe boiling water reactor.
Supervisor Radiological Controls

1984 to 1987 — **Institute for Resource Management,** Palo Verde Nuclear Generating Station
Senior Radiological Engineer

1983 to 1984 — **Combustion Engineering,** Palo Verde Nuclear Generating Station, Phoenix, AZ
Radiological Engineer

9/82 to 8/83 — **American Nuclear Services Corporation**
Chemistry and Radiological Controls Foreman

1981 to 1982 — **Allen Nuclear Associates**
Health Physicist

1980 to 1981 — **Allied Nuclear, Inc.,**
Health Physics Supervisor

SIGNIFICANT ACCOMPLISHMENTS

- Provided technical support to the Radiation Protection Manager at a DOE complex in Eastern Washington State to facilitate program implementation of Title 10, Part 835 of the Code of Federal Regulations.
- Assessed DOE facility programs, procedures, and management implementation of these programs at a major DOE weapons complex facility.
- Responsible for supporting accident investigations, determination of OSHA recordability, maintenance of OSHA required documentation, scheduling of medical surveillance exams, and coordination of safety related training.
- Review, evaluate, and interpret health physics practices and regulations related to nuclear fuel cycle facilities including fuel fabrication, production reactors, fuel processing radioactive waste processing and disposal, and nuclear research and development facilities.
- Provide health physics technical support for the development of National Environmental Policies Act (NEPA) documentation preparation. Planned, coordinated, reviewed, and prepared health physics-related input to various NEPA documents.
- Provide consulting services to the Department of Energy (DOE) and commercial clients in the area of general and occupational health physics, decontamination and decommissioning, environmental restoration, ALARA, radioactive waste management, regulatory compliance and hazardous waste site characterization.
- Provide project management support for NRC license termination activities for commercial laboratories and manufacturing facilities.
- Prepared successful proposals
- Direct interface with various clients and regulators
- Developed and implemented the Halliburton NUS Aiken facility safety program.
- Managed the radiological control program for the DOE environmental restoration activities of the Uranium Mill Tailings Recovery ACT (UMTRA) and Defense Decontamination and Decommissioning (D&D) Programs.
- Previewed and implemented DOE Orders and guidance for the control of radiation protection programs and practices including programmatic audits of compliance.
- Developed the implementation plan and implementing documents for DOE Radiological Controls Manual.
- Developed and issued the facility Safety Analysis Report.
- Performed chemical hazard and chemical safety assessments for onsite laboratory facilities with a chemical inventory of 2000+ chemicals and chemical compounds.
- Prepared an annual $6 million budget in support of environmental restoration activities for 4,000+ private residences and 200+ businesses that had been contaminated with Uranium mill tailings.
- Completed the implementation of the DOE Radiological Control Manual prior to the DOE mandated deadline with no significant impact on the facility mission.
- As project manager and senior editor, developed the facility Safety Analysis Report (SAR), which addressed laboratory operations, environmental restoration sites with chemical, radiological, and construction hazards and included operations on 5 sites in 3 states.
- Responsible for HP program development of the radiological control program for DOE environmental restoration projects to ensure compliance with DOE Order 5480.11 and Industrial Hygiene tasks.
- Developed the company ALARA Program and necessary procedures for implementation.
- Functioned as the company ALARA Coordinator and chairman of the ALARA Committee.
- Responsible for the assessment of remediation projects for the UMTRA, Comprehensive Environmental Response Compensation and Liability Act (CERCLA), and Superfund Act and Reauthorization Amendments of 1986 (SARA), (29 CFR 1910.120 and 29 CFR 1910.1200.

- Responsible for the administration and management of a $3.5 million annual technical support contract in addition to a $7 million annual department budget.
- Managed an operating staff of 6 non union shift supervisors and 34 union health physics technicians, and 75 additional technicians during scheduled plant maintenance outages.
- Tock part in union negotiations and strike avoidance measures as a part of a management team at a commercial nuclear facility.
- Assigned to Arizona Public Service, Palo Verde Units 1,2, and 3 for start up testing of the radiological effluent monitoring system for the 3 unit reactor site.
- Designed and constructed a portable sampling system for use in the post accident environment. This system was used to provide effluent monitoring capability in an action statement condition during the initial fuel loading of Palo Verde Unit 1 when the installed systems did not operate as designed.
- Designed and developed isokinetic sampling systems for the station contaminated laundry and radioactive waste handling facilities.
- Supplemented the staff of Georgia Power Company's Plant E.I. Hatch nuclear station, a 2 unit boiling water reactor station.
- Responsible for the routine chemistry and radiological controls activities in support of the operation of both units and logistical control of staffing resources during maintenance outages.
- Developed the decontamination plan that resulted in the release for open access of the joint unit 1 and unit 2 refueling floor and the development of a program in support of spent fuel pool diving operations for the repair of a damaged steam drier.
- Responsible for the startup testing of the radiological effluent monitoring systems for Southern California Edison's San Onofre Nuclear Generating Station Units 1 and 2.
- Developed a station training manual for the operation of the radiation monitoring systems for units 1 and 2.
- Developed the operating procedures for the installed radiation monitoring systems.
- Supervised 78 health physics technicians and 35 decontamination technicians during the steam generator repair project at Southern California Edison's San Onofre Nuclear Generating Station, Unit 1.
- Implemented remote monitoring capability for monitoring workers in high radiation areas.
- Designed specialty shielding for use inside the steam generator channel head that resulted in a factor of 10 reduction in personnel radiation exposures.
- Developed a radiological training program for steam generator repair activities.

1968 to 1980 **U.S. Navy**
Chief Petty Officer, Honorably discharged

PAPERS AND PUBLICATIONS

- Dwaine Brown, ALARA Aspects of Decontamination and Decommissioning at Grand Junction. Presented at the Department of Energy ALARA Workshop, Brookhaven National Laboratory, April 1992.
- Dwaine Brown, Determination of Absorbed Beta Dose in Materials, "Radiation Protection Management," Volume 9, No. 4, July/August 1992
- Dwaine Brown, Evaluation of Available Data for the Determination of Plutonium Concentrations Immediately Dangerous to Life and Health (IDLH), research conducted in support of Department of Energy-Savannah River Field Office, Department of Environmental Safety and Health.

MEMBERSHIPS American Nuclear Society
Health Physics Society
National Registry of Radiation Protection Technologists

APPENDIX C

Technical Basis Document for Ronson Metals Facility Release Criteria

Introduction

The planning and cost estimation for the Decontamination and Decommissioning of the Ronson Metals Facilities part of the licensing process to establish the cost schedule for license termination. This effort is based on current radiological conditions as found in the laboratory. This document establishes the technical basis by which current radiological surface release criteria are applied to accomplish decontamination prior to final decommissioning.

Radiological release criteria for surfaces are defined in ANSI N13.11, "Control of Radioactive Surface Contamination on Materials, Equipment, and Facilities to Be Released for Uncontrolled Use" and are published in U. S. Nuclear Regulatory Commission Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors". There is no appreciable difference in decontamination criteria between these two standards. Both documents serve as guidance for establishing release criteria.

Release Criteria

The surface radiological contamination release criteria for the Ronson Metals Facility are shown in Table 1, "Surface Contamination Guidelines for the Ronson Metals Facility." These criteria are provided by US NRC Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors". The criteria in Table 1 are the maximum allowable quantities of radioactive material that may be left on surfaces of equipment and facilities that are to be released to the general public for unrestricted use. The term "Unconditional Free Release" is a generally accepted term in industry and is used synonymously with unrestricted use. It is the policy of Brown & Root Environmental to apply the As Low As is Reasonably Achievable (ALARA) philosophy to release criteria. Good engineering practices, sound judgment, and economic consideration dictate the intent of Brown & Root Environmental to typically release surfaces at or below the detection capabilities of the instrumentation being used. The release criteria stated in Table 1 shall be applied only as the upper limit of radioactive surface contamination for free release of equipment, materials and areas by Brown & Root Environmental when special circumstances warrant.

Release limits are grouped into several categories depending on the radiotoxicity of the radioisotope as seen in Table 1. For each area, Brown & Root Environmental will identify radioisotopes through analytical techniques and determine their corresponding activity fractions. Release limits can then be determined on the weighted activity fraction of each isotope. If radioisotopes or activity fractions are not known or vary significantly, then release limits will be based on the most restrictive nuclides to be encountered by Brown & Root Environmental. These release limits for gross alpha and gross beta-gamma are shown in Table 2.

Table 1. Surface Contamination Guidelines

Radionuclides (2)	Allowable Total Residual Surface Contamination (dpm/100 cm^2)		
	Average (3,4)	Maximum (4,5)	Removable (4,6)
Transuranics, I-125, I-129, Ra-226, Ac-227, Ra-228, Th-228, Th-230, Pa-231	100	300	20
Th-Natural, Sr-90, I-126, I-131, I-133, Ra-223, Ra-224, U-232, Th-232	1,000	3,000	200
U-Natural, U-235, U-238, and associated decay products, alpha emitters	5,000	15,000	1,000
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission, except Sr-90 and others noted above(7)	5,000	15,000	1,000

[1]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 measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

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

[3]Measurements of average contamination should not be averaged over and area of more than 1 m^2. For objects of less surface area, the average should be derived for each such object.

[4]The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr, respectively at 1 cm.

[5]The maximum contamination level applies to an area of no more than 100 cm^2.

[6]The amount of removable material per 100 cm^2 of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. 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. It is not necessary to use wiping techniques to measure removable contamination is direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

[7]This category of radionuclide includes mixed fission products, including Sr-90 which has been separated from the other fission products or mixtures where Sr-90 has been enriched.

Table 2. Release Limits for Gross Activity (Unknown Isotopes) - Regulatory

Emission	Removable (dpm/100 cm^2)	Total (Fixed and Removable) (dpm/100 cm^2)
Alpha	*20	*300
Beta-Gamma	**200	**1000

* Based on TRU, Ra-226 and Th-230
** Based on Sr-90 and Th-232

Release Limits for Gross Activity (Unknown Isotopes) - ALARA Goal

Emission	Removable (dpm/100 cm^2)	Total (Fixed and Removable) (dpm/100 cm^2)
Alpha	LLD*	15
Beta-Gamma	LLD*	400

* Based on count times presented in Attachments

Natural and Electronic Background

The application of release criteria standards cannot be successfully applied without the understanding of background. Two types of background exist: natural and electronic. Natural and electronic background significantly impact the release criteria by the following:

- Natural background, by providing a quantity of radioactive material which is available to be detected.

- Electronic background, by influencing the least amount of radioactivity that can be measured by a particular instrument.

It is necessary to distinguish the difference of the two types of background. Obviously, the term background could apply to either. The following are the terms as accepted by industry practice.

Generic term - natural background, the amount of radioactive material that exists in a substance, surface, or material as a result of nature. The quantity of natural background is generally expressed in terms of picocuries per gram (pCi/g), femtocuries per liter (10^{-15} Ci/l), milligrams per milliliter (mg/ml), disintegrations per minute (dpm), or other suitable combinations of activity or quantity per unit mass or area.

Generic term - electronic background, the amount of electronic signal produced by electronic noise which results in a meter or scalar deflection. Instrument background is generally expressed in counts per minute (cpm), picocuries per gram (pCi/g), milligrams per liter (mg/l), or other suitable units.

Determining Background

Accurately determining both types of background must be accomplished before applying release criteria. Two industry accepted practices exist for determining natural background in materials. The first method is to measure accurately the naturally-occurring radioactivity in materials with the appropriate analytical instrument. This is accomplished by collecting a clean sample of similar material from an uncontaminated source. An example of this type of natural background determination is to measure the radioactivity in a piece of lumber from the hardware store or a quart of motor oil obtained from a retail store. The expected results for such an analysis would be 1 to 2 pCi/g in wood for natural uranium and less than 0.1 pCi/l for mixed fission products in oil. The same process can also be applied to chemical contaminants in various matrices.

The other type of material background analysis is a statistical procedure called Chauvenet's Determination. This process requires making a large number of radiation measurements in a defined area and then casting out the larger measured results. The average of the smaller remaining results is considered to be background for the defined population.

Both of these techniques may be applied for determination of natural background for the Ronson Metals Facility.

Electronic background is determined by measuring the signal output for a particular instrument when subjected to an area or matrix that contains no radioactive material other than natural or cosmic radiation. For field beta/gamma type instruments, the background typically range from 100 to 500 counts per minute. For a laboratory type alpha scintillation counter, the background could be less than 1 count per 2 minutes of counting time.

Instrumentation and Application

The Ronson Metals Facility will use field instruments, laboratory techniques, and survey techniques capable of achieving detection limits at or below the upper bounds of the release criteria stated in Table 1. Current Brown & Root Environmental instruments have LLDs lower than the surface contamination guidelines for the most restrictive nuclides shown in Table 1. However, Brown & Root Environmental will not continue to upgrade with state-of-the-art detection systems simply to drive the lower limit of detection (LLD) continually lower. Surfaces with detectable radioactive contamination levels greater than the LLD but less than the stated release criteria will be evaluated based upon ALARA analyses for decontamination, disposal, or free release. Materials greater than the release criteria will be decontaminated or disposed of as radioactive waste.

Lower Limits of Detection

The LLD as used in this technical basis document is the smallest amount of sample activity that will yield a net count for which there is a 95% confidence level that the activity is present. The LLD is *a priori* (before the fact) estimate of the capabilities of a given detection system. The LLD does not depend on the sample activity but rather on the detection capability of the detection process itself (i.e., detection efficiency and background count rate).

The formula for LLD is given below:

$$LLD = \frac{3 + 4.65(S_b)}{Eff(T)}$$

Where:

S_b = standard deviation of background or blank counts (C) for a counting time, defined as $\sqrt{C_b}$

T = counting time for samples, background or blanks; in units of minutes (m). All counting times are set equal.

Eff = counting efficiency in units of c/d; the number of counts (detections) per the number of disintegration from a calibration source.

This approach uses the methodology contained in Brodsky's and Gallagher's Paper, "Statistical Considerations in Practical Contamination Monitoring" published in Radiation Protection Management, Volume 8, Number 4, which discusses the derivation of the LLD formula and discusses Type I α (false detection) and Type II β (false non-detection) errors. For radioactivity measurements performed by Brown & Root Environmental, the LLD, as defined above, establishes a 5% chance of incorrectly detecting activity when it is absent and a 95% confidence that activity will be detected when it is present.

Typical LLDs shown in Appendix 2 have been calculated for the detection equipment used by Brown & Root Environmental to determine free release levels.

Instrument Calibration

Field instruments and laboratory instruments shall be calibrated in accordance with ANSI N323, "Radiation Protection Instrumentation Test and Calibration". Instrument calibrations will be in accordance with formal procedures including reference checks and documented maintenance programs.

Quality Assurance

Instrument calibrations shall be performed with National Institute of Standards and Testing (NIST) traceable standards. Reference checks shall be performed in accordance with formal Brown & Root Environmental procedures. Final release of buildings and grounds shall be verified by an Independent Verification Contractor (IVC).

Summary

Surface contamination release criteria have been developed for the Ronson Metals Facility as shown in Table 1. Latest instrumentation technology and nuclear industry standards have been used to develop and apply these criteria. Brown & Root Environmental will release materials at or below the limits defined in Table 1. It is Brown & Root Environmental's policy to release for unrestricted use materials, equipment, and areas at the lower level of detection of our radiation detection equipment when it is based on sound ALARA analyses to do so.

LLDs for 1 Minute Static Counts

T = 1 min.

$S_b = \sqrt{C_{Bkg}}$

R Bkg α = 0.2 cpm
R Bkg β = 200 cpm
Eff_α = .42 c/d (Pu-239)
Eff_β = .50 c/d (Sr-90)

C Bkg α = 0.2c
C Bkg β = 200c
$S_{b\alpha}$ = 0.45
$S_{b\beta}$ = 14.14

$$LLD_\alpha = \frac{3 + (4.65)(S_b\alpha)}{(Eff_\alpha)(T)}$$

$$= \frac{3 + 4.65(0.45)}{(0.42)(1)}$$

14.14 dpm per probe area

$$LLD_\beta = \frac{3 + 4.65(S_b\beta)}{(Eff_\beta)(T)}$$

$$= \frac{3 + 4.65(14.14)}{(.50)(1)}$$

=138 dpm per probe area

LLDs for Scanning Uniformly Distributed Sources of Surface Radioactivity

LLDs for uniformly distributed sources are expected to approach those of the minute static counts. Brown & Root Environmental will also instruct technicians to perform a static 1 minute count if increased count rate is detected.

LLDs for Scanning Point Sources of Surface Radioactivity

Width of probe = 5 cm
Assume Scanning Speed = 3 cm/sec
Time for Probe to Pass Over Point Source = 1.67 sec = .028 min

LLD α Point Source Scan

$$C_{bkg} = \frac{0.2c}{min} \times 1.67\sec \times \frac{1\min}{60\sec} = 0.0056C$$

$$S_b a = \sqrt{C_{Bkg}}\, a = \sqrt{0.0056} = 0.07$$

$$\frac{3 + 4.65(0.075)}{.42(0.028)} = 284\text{dpm} = 290\text{dpm}$$

=284 dpm = 290 dpm

LLD β Point Source

$$C_b = \frac{200c}{min} \times 1.67\sec \times \frac{1\min}{60\sec} = 5.56C$$

$$S_b \beta = \sqrt{C_b}\,\beta = \sqrt{5.56} = 2.36$$

$$T = 1.67\sec \times \frac{1\min}{60\sec} = 0.028\min$$

$$\frac{3 + 4.65(2.36)}{.5 \times (0.028)} = 998\text{dpm} = 1000\text{dpm}$$

Many assumptions are made when estimating the LLD for detection of a point source of surface radioactivity (i.e., scanning speeds, distance of the probe from the source, background rates, etc.) and all may fluctuate under given field conditions. Based on the above assumptions, the LLDs for the Bicron instrument for a point source of surface radioactivity are approximately 290 dpm (alpha) and 1000 dpm (beta). Both activity levels are less than the most restrictive "maximum" values given in Table 1.

JAN 12 1995

Mr. Erwin Gary Ganz
Ronson Metals Corporation
P.O. Box 6707
Campus Drive
Somerset, NJ 08875

SUBJECT: LICENSE RENEWAL APPLICATION

Dear Mr. Erwin:

This is to acknowledge receipt of your application for renewal of material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified above.

Sincerely,

ORIGINAL SIGNED BY:
SHERYL VILLAR

Sheryl Villar, Chief
Licensing Assistance Section
Division of Radiation Safety
and Safeguards

Docket No. 040-08843
License No. STB-1451
Control No. 121068

DOCUMENT NAME: S:\PENDING\RONSON.DTL
To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	RI/DRSS		RI/DRSS		/					
NAME	Brown/GMP		Villar							
DATE	01/12/95		01/12/95		01/ /95		01/ /95		01/ /95	

OFFICIAL RECORD COPY

ML 10

040-08843

WALDER, SONDAK & BROGAN, P.A.

A PROFESSIONAL CORPORATION

COUNSELLORS AT LAW

5 BECKER FARM ROAD

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TELECOPIERS: (201) 992-1505
(201) 992-1006

January 4, 1995

REFER TO FILE NO.

40010.125

CERTIFIED MAIL R.R.R.

Tara L. Weidner
United States Nuclear Regulatory Commission
Region 1, 475 Allendale Road
King of Prussia, PA 19406-1415

RE: Ronson Metals Corporation ("RMC")

Dear Ms. Weidner:

I write, in accordance with your instructions, in response to the November 4, 1994 letter from the United States Nuclear Regulatory Commission ("NRC") pertaining to of Ronson Metals Corporation's License No. STB-1451. This license expires as of February 28, 1995. As you know, RMC has been actively involved within the NRC relative to delicensing the facility for which the subject license has been issued. Recognizing that this delicensure process may not be concluded prior to the February 28, 1995 expiration of RMC's license, please accept this letter as RMC's formal request to renew its license until such time as the delicensure process is concluded.

Should you require any additional information, please feel free to contact me.

WALDER, SONDAK & BROGAN, P.A.
Attorneys for Ronson Metals Corporation

BY: _____
JEFFREY A. WALDER

JAW:jp
cc: Louis V. Aronson, II

Check No. 527 $1400
Type of Fee: RCN 3/3/95
Date Check Rec'd
Date Completed: JAN - 6 1995
By

121068

OFFICIAL RECORD COPY ML 10

NRC FORM 577 (10-94)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSE FEE REQUIREMENTS

LICENSE FEE AND DEBT COLLECTION BRANCH
DIVISION OF ACCOUNTING AND FINANCE
OFFICE OF THE CONTROLLER
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001
ATTN: BRENDA BROWN

RONSON METALS CORP.
ATTN: JEFFREY A. WAIDER
5 BECKER FARM ROAD
ROSELAND, NJ 07068-1777

TYPE OF ACTION

- [ ] NEW LICENSE
- [X] RENEWAL OF LICENSE
- [ ] AMENDMENT TO LICENSE

REQUESTED DATE: LETTER DTD 1/4/95

LICENSE NUMBER: STB-1451

CONTROL NUMBER: 12068

I. APPLICATION FEE DUE

Your request for a licensing action is subject to the fee(s) in the category(ies) noted below in accordance with Section 170.31 of the enclosed Federal Register notice. Payment of the fee is required prior to the issuance of the license, renewal, or amendment.

FEE CATEGORY	APPLICATION	RENEWAL	AMENDMENT
2.C.	$	$ 1,400	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$

FEE(s) DUE $ 1,400
PAYMENT RECEIVED $ -0-
AMOUNT DUE $ 1,400

- [X] Your request was received without the prescribed application fee.
- [ ] We received your Check No. _____ in the amount of $_____. Payment of the additional fee noted above is required.
- [ ] Your request will increase the scope of your license program Therefore, your request is subject to the application fee(s) noted above. Refer to Section 170.31 and Footnote 1(d)(2).
- [ ] Your license expired prior to the receipt of your application for renewal. Therefore, your request is subject to the application fee(s) noted above. Refer to Section 170.31 and Footnote 1(a).

MAKE PAYMENT OF THE FEE(S) TO THE U.S. NUCLEAR REGULATORY COMMISSION AND MAIL THE PAYMENT TO THE ADDRESS LISTED AT THE TOP OF THIS FORM. IF WE DO NOT RECEIVE A REPLY FROM YOU WITHIN 30 CALENDAR DAYS FROM THE DATE LISTED BELOW, WE SHALL ASSUME THAT YOU DO NOT WISH TO PURSUE YOUR APPLICATION AND WILL VOID THIS ACTION.

II. FEE NOT REQUIRED

- [ ] Enclosed is Check No. _____ which accompanied your request. The fee is not required because:
  - [ ] We received your Check No. _____ in payment of the fee.
  - [ ] The Licensing staff has informed us that your request is to be considered as a continuation of your request dated _____, Control No. _____.
  - [ ] Your request was combined, prior to review, with your _____ request, Control No. _____.

III. CHECK RETURNED

- [ ] Enclosed is Check No. _____ which was returned to us by the bank for:
  - [ ] INSUFFICIENT FUNDS
  - [ ] ACCOUNT CLOSED
  - [ ] OTHER

MAIL THE REPLACEMENT CHECK TO THE ADDRESS LISTED AT THE TOP OF THIS FORM AND REFERENCE THE ABOVE CONTROL NUMBER.

IV. LICENSE ISSUED WITHOUT THE REQUIRED FEE

- [ ] License No. _____, Amendment No. _____, issued on _____ was issued without the required fee being collected. The fee required is noted in Section I of this form.
- [ ] The scope of your licensed program was increased. Therefore, your request is subject to the application fee(s) noted in Section 1 of this form. Refer to Section 170.31 and Footnote 1(d)(2).
- [ ] Because of the urgency of your request, the license was issued without remittance of the prescribed fee noted in Section 1 of this form.

SIGNATURE -- LICENSE FEE ANALYST	LFDCB	LFDCB
Brenda Brown	BB 1/11/95	1 1

DISTRIBUTION
OC/DAF/RF
LFDCB R/F (2)
Pending fee file
Region I

DATE 1/10/95

NRC FORM 577 (10-94)

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 11200
STATUS CODE: 2
FEE CATEGORY: 2C
EXP. DATE: 19950228
FEE COMMENTS: STORAGE ONLY EFF 9/30
DECOM FIN ASSUR REQD: _

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: RONSON METALS CORP.
RECEIVED DATE: 950106
DOCKET NO: 4008843
CONTROL NO.: 121068
LICENSE NO.: STB-1451
ACTION TYPE: RENEWAL

2. FEE ATTACHED
AMOUNT: 0
CHECK NO.: 0

3. COMMENTS

SIGNED M. A. Perkins
DATE 1/12/95

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED /✓/)

1. FEE CATEGORY AND AMOUNT: 2C *1400

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
AMENDMENT ✓
RENEWAL
LICENSE

3. OTHER

SIGNED
DATE 3/3/95

LFMS 07/15/93