

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete 6, 7, items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT (Institution, firm, hospital, person, etc.) Headquarters, US Army Chemical-Biological-Pathological Agency, ATTN: S-UCB-TO-XA Army Chemical Center, Maryland		(b) STREET ADDRESS, IF AT WHICH BYPRODUCT MATERIAL WILL BE USED (different from 1 (a).) USARAL Radioactive Material Disposal Facility, Headquarters, USARAL Support Command, Fort Richardson, Alaska
2. BYPRODUCT MATERIAL USARAL Radioactive Material Disposal Facility, USARAL Support Command, Fort Richardson, Alaska		3. PREVIOUS LICENSE NUMBER(S) (If this is an application for renewal of a license, please indicate and give number.) (AEC License No. 8-5246-1)
4. INDIVIDUALS USING: (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.) Radiologically trained personnel designated by the Radiation Protection Officer.		5. RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.) Halvor E. Hude, Major, CmlC, 068120 (See Appendix 1, Annex II) R. S. Malcooley, Captain, CmlC, 072135 (On-the-site representative) (See Appendix 2, Annex II)
6. (a) BYPRODUCT MATERIAL (Elements and mass number of each.)	(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLCURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)	
(1) Any byproduct material with Atomic Numbers 1 thru 84 inclusive	Any chemical and/or physical form 100 curies total	
(2) Source material.	Any chemical and/or physical form 6000 pounds total	
(3) Special nuclear material	Any chemical and/or physical form 300 grams total	

7. PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED (If byproduct material is for "human use," supplement A (form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

This is an application for an AEC License to authorize the USARAL Radioactive Material Disposal Facility, Fort Richardson, Alaska, to accumulate, package and dispose of unwanted radioactive material by transfer to authorized licensees or to the National Land Burial Site, Idaho Falls, Idaho. Radioactive waste will be received from U. S. Army installations and activities and from such other Federal agencies who, in the interest of safety and economy, desire to utilize the Army's disposal service. Also see Annex I.

(Continued on reverse side)

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)				
Type of Training	Where Trained	Duration of Training	On the Job (Check one)	Formal Course (Check one)
a. Principles and practices of radiation protection	See Appendix 3 of Annex III		Yes No	Yes No
b. Accuracy measurement standards, techniques, monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of ionizing radiation			Yes No	Yes No

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience)			
Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience
See Annex II			

RADIATION DETECTION INSTRUMENTS (Use supplemental sheets if necessary)					
Type of Instruments (Include make and model number of each)	Number Available	Radiation Detected	Sensitivity Range (mR/hr)	Window Thickness (mg/cm ²)	Use (Monitoring, surveying, measuring)
See Appendix 3 of Annex III					

11. METHODS, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE

Instruments are calibrated every 30 days or more often, if required, and are checked before each use. See Appendix 3 of Annex III.

12. FILM, BATH, DEVELOPER, AND PROCESSING PROCEDURES USED (Use for subject, method of calibrating and processing, or name of supplier)

Film badge service is supplied by U.S. Army Signal Corps. Dosimeters and other monitoring devices are issued as required. Bioassay evaluation of internal exposures will be conducted by U.S. Medical Corps when required.

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

13. FACILITIES AND EQUIPMENT: Describe laboratory facilities and related building equipment, storage containers, shielding, fume hoods, etc. Explain safety features. (Circle answer) Yes No

See Annexes III & IV

14. RADIATION PROTECTION PROGRAM: Describe the radiation protection program including control measures. If application covers sealed sources, submit hot labing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

See Annex III

15. WASTE DISPOSAL: If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

T/A

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE, OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 20, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

Applicant named in item 1

15 APR 1963

SEP 12 1963

WILLIAM S. WILEY JR, Lt Col, G-3
Chief, CBR Division, G-3
Headquarters, U. S. Army, Alaska

Title of certifying official

Headquarters, U. S. Army, Alaska

WARNING—18 U. S. C., Section 1001, Act of June 25, 1948, 52 Stat. 749, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States in any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE: 1961 O-541883

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ANNEX I

CONCEPT OF OPERATION

1. US Army units and activities generating radioactive waste will request and receive disposition instructions from Commanding Officer, USARAL Support Command, Fort Richardson, Alaska in accordance with AR 755-330

2. Radioactive waste will be collected by or forwarded to the USARAL Radioactive Material Disposal Facility, Fort Richardson, Alaska where waste will be consolidated, processed and packaged for transfer to AEC-designated sites for land burial. Where it is more advantageous to the Army, waste will be transferred directly from generating agency to ultimate disposal site. In addition to handling Army radioactive waste, the USARAL Radioactive Disposal Facility will dispose of waste generated by Federal agencies which, in the interest of safety and economy, desire to utilize the Army's disposal service.

ANNEX II
RADIATION PROTECTION OFFICERS

1. The USARAL Radiation Safety Officer is Major Halvor E. Hude. The Alternate USARAL Radiation Safety Officer is Captain T. S. Malcooley. Resumes of the training and experience of Major Hude and Captain Malcooley are attached as Appendixes 1 and 2 to this annex.

2. In addition to the responsibilities assigned him in the Director of Supply and Procurement Operating Procedure Number A001 (attached as Annex III to ASD Form 313) the USARAL Radiation Safety Officer and his alternate are responsible for assuring that prior to handling radioactive material or being exposed to radiation therefrom, personnel receive the training required by 10 CFR 20.206 and such additional detailed training which is required to meet the needs of the individual.

Appendix 1 - Training and Experience of Major Halvor E. Rude

1. Educational Background.

<u>Degree</u>	<u>Major</u>	<u>Educational Institution</u>	<u>Year</u>
BS	Chemistry	Delta State Teachers College	1950
MS	Physics	US Navy Postgraduate School	1960

2. Specialized Formal Training in Radiation and Supporting Subjects.

<u>Course Title</u>	<u>Where Received</u>	<u>Duration</u>	<u>When Received</u>
Radiation Defense and Protection Problems	US Army Chemical Corps School	30 hours	1950
Radiological Instruments	"	8 hours	"
Lab Work on Scalers and Radiation Detection Instruments, to include determination of Unknown Isotopes, Calibration, and Survey Techniques	"	45 hours	"
Mathematics and Chemistry Review as it pertains to Radiation Protection and Defense	"	11 hours	"
Medical Aspects of Radiation Effects	"	7 hours	"
Monitoring	"	12 hours	"
Physics, General	"	13 hours	"
Radiological Defense Training Programs	"	10 hours	"
Nuclear Explosion Phenomena and Fallout	"	6 hours	"
General Biology	Delta State Teachers College	11 Qtr hours	1947-1948
General Chemistry	"	12 Qtr hours	"
College Algebra	"	8 Qtr hours	"
Plane Trigonometry	"	4 Qtr hours	"

2. Gen'l

<u>Course Title</u>	<u>Where Received</u>	<u>Duration</u>	<u>When Received</u>
Organic Chemistry	Delta State Teachers College	12 Qtr hours	1948-1949
General Physics	"	12 Qtr hours	"
Analytical Geometry	"	4 Qtr hours	"
Bacteriology	"	5 Qtr hours	"
Physiology	"	6 Qtr hours	1949-1950
Vertebrate Anatomy	"	5 Qtr hours	1948-1949
Theory of Equations	"	3 Qtr hours	1949-1950
Advance Qualitative Analysis Chemistry	"	4 Qtr hours	"
Calculus	"	12 Qtr hours	"
Quantitative Analysis Chemistry	"	12 Qtr hours	"
Analytical Geometry	"	4 Qtr hours	"
Electronics	US Navy Postgraduate School	12½ Qtr hours	1958-1959
Optics	"	4½ Qtr hours	"
Engineering Mechanics	"	6 Qtr hours	"
Mechanics	"	4 Qtr hours	"
Physical Chemistry	"	5 Qtr hours	"
Fourier Series and Complex Variables	"	5 Qtr hours	"
Atomic Physics	"	3 Qtr hours	"
Atomic Physics Lab	"	1½ Qtr hours	"
Probability & Statistical Inference for Engineers	"	5 Qtr hours	"
Nuclear Physics	"	4 Qtr hours	1959-1960

2. Course

<u>Course Title</u>	<u>Where Received</u>	<u>Duration</u>	<u>When Received</u>
Nuclear Physics Lab	US Navy Postgraduate School	1½ Qtr hours	1959-1960
Heat Transfer	"	3 Qtr hours	"
Shock Wave in Fluids	"	4 Qtr hours	"
General Biology	"	5 Qtr hours	"
Electricity & Magnetism	"	6 Qtr hours	"
Thermodynamics	"	3 Qtr hours	"
Introduction to Quantum Mechanics	"	4 Qtr hours	"
Animal Physiology	"	5 Qtr hours	"
Radiation Biology	"	5 Qtr hours	"
Radiochemistry	"	4 Qtr hours	"
Blast & Shock Effects	"	3 Qtr hours	"
Kinetic Theory of Statistical Mechanics	"	4 Qtr hours	"
Nuclear Weapons Employment Course	Armed Forces Special Wpns Course, Albuquerque, NM	6 weeks	1956
Nuclear Weapons Employment Course (Includes approx 50 hours of instruments, calibration, monitoring, surveying and Medical Aspects)	US Army Chemical Corps School, Ft McClellan, Alabama	6 weeks	1955

3. Vocational Experience.

a. Instructor in Radiac Instrumentation at the Special Weapons Orientation Course and Instructor in CBR Defense, US Army Air Defense School, August 1952 to May 1953.

b. Instructor in Physical Sciences, US Army Chemical Corps School, Fort McClellan June 1956 to June 1958.

3. Service

a. Student, Nuclear Engineering, US Navy Postgraduate School, Monterey, California, August 1950 to May 1951.

b. Department of Army Project Officer, US Navy Radiological Laboratory, San Francisco, California, June 1960 to June 1961.

c. Nuclear Effects Engineer to include duty as USARAL Radiation Protection Officer, US Army, Alaska, APO 949, Seattle, Washington. July 1961 to present.

4. Vocational Experience with Ionizing Radiation.

<u>Place of Employment</u>	<u>Projects involved</u>	<u>Time Frame</u>
US Army Air Defense School, Fort Bliss	Classroom demonstration of instrument operation using 100 milli curie Cobalt 60 source and a 40 milli curie Strontium 90 source.	August 1952 to May 1953

5. Specialized Training and Experience.

a. Principles and Practices of Radiation Protection.

<u>Where Trained</u>	<u>Kind of Training</u>	<u>Duration</u>
US Army Chemical Corps School, Edgewood, Maryland.	Formal	5 weeks
US Army Chemical Corps School, Fort McClellan.	Formal	50 hours
US Army Chemical Corps School, Fort McClellan.	On the job	2 years
US Navy Postgraduate School, Monterey.	On the job Formal	3 months 3 months
US Army Alaska	On the job	15 months

b. Radioactivity Measurement, Standardization and Monitoring Techniques and instruments.

<u>Where Trained</u>	<u>Kind of Training</u>	<u>Duration</u>
US Army Chemical Corps School, Edgewood.	Formal	65 hours
US Army Air Defense School, Fort Bliss.	On the job	10 months

<u>Where Trained</u>	<u>Kind of Training</u>	<u>Duration</u>
US Army Chemical Corps School, Fort McClellan.	Formal	50 hours
US Navy Postgraduate School, Monterey.	Formal	40 weeks
US Army, Alaska	On the job	15 months

c. Mathematics and Calculations Basic to the Use and Measurement of Radioactivity.

<u>Where Trained</u>	<u>Kind of Training</u>	<u>Duration</u>
Delta State Teachers College.	Formal	72 weeks
US Army Chemical Corps School, Edgewood.	Formal	165 hours
US Navy Postgraduate School, Monterey.	Formal	80 weeks
US Army Alaska	On the job	15 months

d. Biological Effects of Radiation.

<u>Where Trained</u>	<u>Kind of Training</u>	<u>Duration</u>
US Army Chemical Corps School, Edgewood.	Formal	7 hours
US Army Chemical Corps School, Fort McClellan.	Formal	2 hours
US Navy Postgraduate School, Monterey.	Formal	10 weeks

e. Actual Experience with Radiation.

<u>Isotope</u>	<u>How Acq</u>	<u>Where Experience Gained</u>	<u>Duration</u>	<u>Type of use</u>
Ra ²²⁶ (un-sealed)	104 millicurie	Fort Richardson, Alaska	15 months	Storage & disposal operations
Pu ²³⁹ (un-sealed)	8 millicurie	"	15 months	"

<u>Isotope</u>	<u>Max Amt</u>	<u>Where Experience Gained</u>	<u>Duration</u>	<u>Type of Use</u>
Co ⁶⁰ (sealed)	300 milli-curie	Fort Richardson	15 months	Calibration, radiological defense project
Co ⁶⁰ (sealed)	100 Milli-curie	Fort Bliss	10 months	Calibration, radiological defense project
Co ⁶⁰ (sealed)	100 milli-curie	Edgewood	20 hours	"
Co ⁶⁰ (sealed)	100 milli-	Fort McClellan	8 hours	"
Miscellaneous unsealed, included: ⁵⁹ Co, ⁶⁰ Co, ⁶⁴ Cu, ⁶⁵ Cu, ²⁰⁴ Tl, ²¹⁰ Bi, ²³⁴ Pa	Microcurie quantities	US Navy Postgraduate School	8 days	Radiochemical Analysis, half-life determination, isotopic separations, radio-chemical assay.
I 131 (unsealed)	170 milli-curie	"	7 days	Radiochemical assay.

C. The above training has been supplemented with the two week on-the-job training course at the Army Chemical Center, Maryland, 22 October through 3 November 1952, and the Occupational Radiation Protection Course, given at the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, 5 November through 16 November 1952, in order to acquire the requisite actual experience and radiation protection training. This on-the-job training included:

- Radiation Protection
- Regulations
- Administration and operation of radioactive waste disposal program
- Personnel and area monitoring
- Radiological emergencies
- Actual experience in utilization as: leak testing of multi curie sources.

Appendix 2 - Training and Experience of Captain R. S. Malooley

1. Educational Background.

<u>Course</u>	<u>Major</u>	<u>Educational Institution</u>	<u>Year</u>
33	General Engineering	US Military Academy (USMA)	1955
34	Physical Chemistry	Columbia University	1961

2. Specialized Formal Training In Radiation and Supporting Subjects.

<u>Course Title</u>	<u>Where Received</u>	<u>Duration</u>	<u>When Received</u>
Radiochemistry	Columbia University	15 weeks	Spring 1961
Chemical Physics	Columbia University	15 weeks	Fall 1960
Biological Chemistry	Columbia University	15 weeks	Spring 1961
Calculus, Differential	USMA and Columbia	15 weeks	Fall 1958 Fall 1959
Calculus, Integral	USMA and Columbia	15 weeks	Spring 1958 Spring 1960
Calculus, Advanced	USMA	10 weeks	Spring 1961
College Algebra	USMA	14 weeks	Fall 1951
Trigonometry, Solid	USMA	10 weeks	Fall 1951
Electronics	USMA	12 weeks	Spring 1951
Nuclear Physics	USMA	10 weeks	Spring 1951
Instrumental Methods of Analysis	Columbia	28 weeks	1960-61
Battery Officers Nuclear Weapons Effects Course	Ft Sill, Oklahoma	5 weeks	1958

3. Professional Society Memberships.

Phi Lambda Upsilon - Honorary Chemical Society

4. Vocational Background.

1955 - Present, US Army

5. Vocational Experience in Ionizing Radiation.

<u>Place of Employment</u>	<u>Projects Involved</u>	<u>Time Frame</u>
Fort Richardson	Chief, Radiochemical Laboratory	July 1961-Present
Fort Richardson	Radiological Monitoring and Decontamination Team Leader	July 1961-Present

6. Specialized Training and Experience.

a. Principles and Practices of Radiation Protection.

<u>Where Trained</u>	<u>Kind of Training</u>	<u>Duration</u>
Columbia University	Formal	15 weeks
Columbia University	On-the-job	13 weeks
Fort Richardson	On-the-job	60 weeks

b. Radioactivity Measurement, Standardization and Monitoring Techniques.

<u>Where Trained</u>	<u>Kind of Training</u>	<u>Duration</u>
Columbia University	Formal	35 weeks
Fort Richardson	On-the job	60 weeks
USMA	Formal	12 weeks
Fort Sill, Oklahoma	Formal	5 weeks

c. Mathematics and Calculations Basic to the Use and Measurement of Radioactivity.

<u>Where Trained</u>	<u>Kind of Training</u>	<u>Duration</u>
Columbia University	Formal	60 eeks
USMA	Formal	64 weeks
Columbia University	On-the-job	30 weeks
USMA	On-the-job	22 weeks
Fort Sill,	On-the-job	5 weeks
Fort Richardson	On-the-job	60 weeks

d. Biological Effects of Radiation.

<u>Where Trained</u>	<u>Kind of Training</u>	<u>Duration</u>
Columbia University	Formal	15 weeks
Fort Richardson	On-the-job	60 weeks

e. Actual Experience with Radiation.

(1) Isotopes

<u>Isotopes</u>	<u>Max Amount</u>	<u>Where Experience Gained</u>	<u>Duration of Experience</u>
Radium 226	104 milli- curies	Fort Richardson	60 weeks
(Used at Radiological Disposal Waste Facility (Storage & Disposal))			
Cobalt 60	300 milli- curies (sealed sources)	Fort Richardson	60 weeks
(Used for Calibration; radiological warfare and defense projects)			

(2) Other Sources of Ionizing Radiation.

<u>Source</u>	<u>Duration</u>	<u>Where</u>	<u>Type of Use</u>
X-ray Diffraction	3 weeks	Columbia University	Laboratory
Electron Microscope	3 weeks	Columbia University	Laboratory

(3) Or Equivalent Experience

<u>Other Experience</u>	<u>Type</u>	<u>Where</u>
Toxic Disposal	Sodium Cyanide (125 pounds)	Fort Richardson, Alaska
Large Area G-Agent Contamination	Chemical Weapons Effects, Research Tests	Dugway, Utah

7. The above training has been supplemented with the two week on-the-job training course at Army Chemical Center, Maryland, 22 October through 3 November 1962 and the Occupational Radiation Protection Course, given at the Robert A Taft Sanitary Engineering Center, Cincinnati, Ohio, 5 November through 16 November 1962 in order to acquire the requisite actual handling experience and radiation protection training. This on-the-job training included:

- a. Radiation protection
- b. Regulations

- e. Administration and operation of a radioactive waste disposal program
- f. Personnel and area monitoring
- g. Radiological emergencies
- h. Actual experience in utilization and leak testing of multi curie sources.

ANNEX III

OPERATING PROCEDURE FOR THE USARAL
RADIOACTIVE MATERIAL DISPOSAL FACILITY, FT. RICHARDSON, ALASKA



USARAL RADIOACTIVE MATERIAL DISPOSAL FACILITY

FT RICHARDSON, ALASKA

Director of Supply & Procurement
Operating Procedure A001

4 March 1963

1. PURPOSE OF THE PROGRAM

Effective Date: Number:

2. SCOPE OF THE PROGRAM

1. March 1963 A001

3. GENERAL OPERATING PROCEDURES FOR THE
USE OF RADIOACTIVE MATERIAL DISPOSAL
FACILITY, Fort Richardson, Alaska

Supersedes: Page:
15 Jan 61 Entirety
ISSUED THROUGH DIRECTORATE

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ANNEX A - REFERENCES

ANNEX B - PHYSICAL LAYOUT OF RADIOACTIVE MATERIAL DISPOSAL FACILITY

ANNEX C - PROTECTIVE CLOTHING AND EQUIPMENT

ANNEX D - RADIOLOGICAL SURVEYS

ANNEX E - PERSONNEL MONITORING

ANNEX F - PERSONNEL DECONTAMINATION

ANNEX G - EQUIPMENT AND AREA DECONTAMINATION

ANNEX H - CERTIFICATE OF CAR OR VEHICLE DECONTAMINATION

ANNEX I - ACCOUNTING PROCEDURES FOR THE RADIOACTIVE MATERIAL DISPOSAL
FACILITY

1. PURPOSE. This SOP furnishes procedures for the storage, handling, packaging and subsurface for radioactive waste by the USARAL Radioactive Waste Disposal Facility (RWDF), Ft Richardson, Alaska.

2. REFERENCES. See Annex A.

3. GENERAL. The RWDF is operated by USARAL Support Command and located on 1-3 1/2 acres in restricted area C. Correspondence concerning radioactive waste should be addressed to the Commanding Officer, USARAL Support Command, APO Seattle, Washington. Annex B shows the layout of the RWDF.

4. RESPONSIBILITIES.

a. Facility Director. The Chief, Chemical Operations Office, Director Supply and Procurement, USARAL Support Command is responsible for overall operation of the RWDF. He will:

(1) Keep the commanding officer informed of all matters pertaining to the disposal of radioactive waste.] who
USA
ALB

(2) Coordinate all staff actions.

(3) Maintain property records reflecting transactions in RWDF receipt through processing to ultimate disposal, in accordance with directives of higher authority and this SOP.

(4) Prepare other records and reports of radioactive material management required by AR 757-500, TM 5-260 and Parts 20 and 30, Title 10, Code of Federal Regulations.

(5) Report immediately all accidents, incidents, injuries or overexposures which occur in the operation of RWDF to:

(a) Commanding Officer, USARAL Support Command.

(b) USARAL Radiological Safety Officer.

(c) Post Safety Officer.

(d) Post Surgeon.

(6) Prepare and submit through channels reports of thefts or accidents required by Sections 20.403, Title 10, Code of Federal Regulations.

b. Facility Supervisor. The Chief, Radiochemical Laboratory is the facility supervisor and is responsible for the operations of RWDF.

He will:

(1) Insure that proper security of RWDF is maintained and that access required for entrance into the facility are kept in the Chemical Operations Office.

(2) Establish inspection and monitoring procedures as necessary to insure that personnel working with radioactive materials are complying with designated safety measures and are not working under unsafe conditions.

Who does the instruction? (3) Insure that personnel working in RMDF are instructed in procedures for radiation safety, radiation protection and the requirements of applicable federal regulations.

(4) Insure that proper radiation dosimeters are provided to personnel working in or visiting the RMDF.

(5) Report all accidents or overexposures which occur in the operations of RMDF to the Facility Director.

(6) Provide information and guidance to damage control and fire fighting personnel in the event of fire or other emergencies.

(7) Supervise personnel and property decontamination.

(8) Insure that radiation exposures of personnel working in or visiting the RMDF are reported to the CO, 514th Medical Company.

(9) Provide necessary laboratory support for RMDF.

c. Chief, Storage Division. The Chief, Storage Division is responsible for:

(1) Furnishing storage labor to the Facility Director as needed.

(2) Furnishing necessary material handling equipment for operation of the RMDF.

d. Chief, Ammunition Division. The Chief, Ammunition Division is responsible for:

(1) Providing a secure area for the RMDF within the ammunition area.

(2) Insuring that no personnel enter the RMDF without the permission of the Facility Director.

5. SUPPORT FOR THE RADIATION PROTECTION PROGRAM.

a. Radiological Safety Officers.

(1) USARAL Radiological Safety Officer: This officer represents the Commanding General, USARAL, on all Atomic Energy Commission licensing matters and is staff coordinator in all matters pertaining to storage, packaging, shipping and disposal of radioactive waste. He exercises technical staff supervision over the operations of the RMDF and reviews all plans for radioactive waste processing to insure that appropriate safety regulations are complied with.

(2) Alternate USARAL Radiological Safety Officer. The Chief, Radiochemical Laboratory, USARAL Support Command is, in addition to being the Facility Supervisor, the Alternate USARAL Radiological Safety Officer.

Medical Center, The Director of Services, USARAF Support Command, will provide medical services for personnel who work in the facility.

(1) Preplacement physical examinations.

(2) Evaluation and treatment of radiation injuries incurred by personnel of the facility.

(3) Collection and shipment of samples for the accomplishment of laboratory tests prescribed by AR 40-502.

(4) Maintenance of DD Form 1181 (Record of Exposure to Ionizing Radiation). This form will be maintained on all personnel working in the facility and will be a permanent part of the individual's health record (see AR 40-502).

(5) Instrument calibration and maintenance. The repair and field calibration of radiation measuring and detecting instruments will be performed by the Maintenance Division, USARAF Support Command.

6. RADIOLOGICAL PROTECTION.

(a) The radioactive material disposal facility will be posted as required by AR 20-201 and 20-204 with signs as prescribed in AR 385-30. Personnel entering the area will have the radiation area sign located approximately 10 feet above the entrance ground level and as close to the entrance as possible. Based upon the results of radiological surveys, RMDF will be posted with radiation area signs to delineate the dose rate contours where the dose exceeds 10 mR/hr. High radiation areas established for periods longer than 30 days will be equipped with an automatic alarm as required by 10 CFR 20.170 (d).

(b) Entering personnel will:

(1) Observe prescribed radiological safety precautions.

(2) Wear an ILL badge and pocket dosimeter (IM-9) when in RMDF, when high-level radioactive waste is being brought into RMDF, or when working in the high-level radioactive waste.

(3) Monitor their own and visitors' hands, shoes and body for contamination before leaving RMDF.

(4) Wear and use such protective clothing and equipment as prescribed to prevent ingestion of radioactive material and over exposure to external radiation sources (See Annex C).

(5) Report all injuries and accidents occurring in RMDF to Facility Supervisor.

(6) Never enter or work alone in RMDF.

(1) Perform necessary surveys and personnel monitoring (Annexes 2 and 6).

(2) Decontaminate self, areas or equipment as required (Annexes 7 and 8).

(3) Report all visitors to RWDF. Visitors will be provided with a radiation badge and a pocket dosimeter (IN-9).

(4) Insure that smoking, eating, drinking or chewing tobacco or ice cream and candy is not allowed.

(5) Insure that contaminated individuals change to clean outer clothing and are transported to the radiochemical laboratory where they will be decontaminated. In event of an injury, contaminated personnel will be removed from the work under supervision of medical personnel from 514th Medical Co. (MC). Clothing will be monitored upon leaving processing area or more thoroughly as required. Contaminated clothing will be disposed of as radioactive waste.

6. References in Annex A are furnished for additional guidance in radiological protection.

7. TRANSPORTATION OF RADIOACTIVE WASTE.

a. Prior to shipping radioactive waste to RWDF, notification of the RWDF will be sent to the Commanding Officer, USARL Support Command, APO SF, San Francisco, California. This notification will be in accordance with the current version of the Department of Defense Manual. Acknowledgement of notification will include any special shipping instructions. Radioactive waste will not be shipped to the RWDF until acknowledgment of notification is received.

b. Shipping of radioactive material from waste-generating agency to RWDF will be by air to the nearest land burial site or from Generating Agency directly to RWDF by air. The RWDF will be in accordance with applicable regulations of the Department of Defense (DDO), US Army and local and state laws. Labels, marks, markings and any applicable, transportation, including packaging, marking and labeling shall be in accordance with paragraph 8 d (3).

c. Waste packages in which licensed material is transported shall be marked on the outside with the words "RADIOACTIVE" and "RWDF" with lettering at least 3 inches in height.

d. In the event of an accident involving any vehicle transporting licensed material, the waste bags shall be taken to prevent exposure of persons to radiation and control the contamination.

e. The RWDF will obtain specific approval from the AEC for modification of or exemption from the above requirements. Requests for such approval will be directed through channels to Chief, Isotopes Branch, Division of Licensing and Regulation, Atomic Energy Commission.

This headquarters will load packaged containers of radioactive material on military or commercial vehicles, vessels or rail cars for transportation to burial sites under conditions specified in this application.

B. RADIOACTIVE MATERIAL DISPOSAL FACILITY PROCEDURES AND OPERATIONS.

1. General. The methods of radioactive material disposal are authorized as discharge of liquid into sanitary sewage systems and burial at national burial site.

(1) Disposal of radioactive liquids. Disposal of radioactive liquids into sanitary sewage systems is authorized provided the criteria established in 10 CFR 20.303 are fulfilled and records maintained to show compliance with 10 CFR 20.303. Radioactive liquids which cannot be disposed of by discharge into sanitary sewage systems will be solidified and processed for disposal at national burial site.

(2) Disposal by burial. Disposal of radioactive waste at national burial site will be accomplished either by direct shipment from site or shipment to the RDTF for storage until sufficient quantities are accumulated for shipment economically feasible.

2. Receipt of radioactive material.

(1) Insofar as possible shipments of radioactive waste will be scheduled and coordinated with the RDTF to assure availability of proper personnel and equipment to receive shipments.

(2) Upon arrival of shipment, disposal facility personnel will inspect containers and vehicle in which it arrived. Vehicles which are contaminated will be decontaminated by facility personnel prior to release. The RDTF Biological Safety Officer will be notified immediately upon discovery of contaminated vehicle or container.

(3) Receipt. In the case of vehicles containing radioactive material to be delivered to destinations other than RDTF, the driver or in case of rail cars, the locomotive agent will be given a statement to attach to the trip log or bill of lading certifying that the vehicle is free of contamination. The format of the certificate is shown in Annex H.

(4) Contents of shipment will be checked against information provided in shipping documents. Any discrepancies will be noted.

3. Storage of Radioactive Material

(1) Radioactive material awaiting disposal and processing will be stored according to type, i.e., metasopes in one group, markers in a separate group, combustibles in another group, etc. The material will be covered to protect it from weather and prevent spreading of contamination.

(2) Waste containing radium or tritium will be stored separately from other waste. It will be stored in the open under protective cover to prevent buildup of radioactive gases.

d. Preparation of radioactive waste for land burial.

(1) The cost for land burial at national sites is based on a fixed price per unit volume or per unit weight with a minimum price per shipment. The NEDP therefore, will act as a collection and consolidation point to avoid costly small shipments to land burial sites.

(2) Packaging of waste will be done only when necessary to comply with ICC regulations. Other than to meet transportation regulations, no special packaging is required for land burial. In the event shipment cannot be made to meet ICC regulations a waiver or special permit will be requested from the ICC. In most cases this will require shipment to be escorted by facility or other qualified personnel.

(3) Packing and shielding. Careful packaging and shielding insures safe handling of radioactive materials during shipment to consignee. The following specifications will be strictly enforced:

(a) The design and preparation of the package must be such that there will be no significant radioactive surface contamination of any part of the container.

(b) The smallest dimension of outside shipping container shall not be less than four inches.

(c) The radiation level at any accessible surface of outside shipping container shall not exceed 200 mrem/hr.

(d) The outside shipping containers shall meet any one of the following specifications given in Part 70 of ICC Regulations:

1. 15A, 15B, 15C, 6A, 6C, 17C, 17H, 21A, or 21B, for the containment of radioactivity in amounts not in excess of 2.7 curies; except polonium, 2 curies and tritium, 5 curies.

2. Specification 55 for containment of solid cobalt-60, cesium-137, iridium-192 or gold-198 in amounts not in excess of 300 curies.

(e) At one meter from any point on the radioactive source container, radiation level shall not exceed 10 mrem/hr.

(f) Containers which contain radioactive material emitting only alpha and/or beta radiation shall contain sufficient shielding to prevent the escape of primary corpuscular radiation to exterior surface and reduce secondary radiation at the surface of container to at least 10 mrem/24 hours at any time during transportation.

(g) Solid and gaseous radioactive materials shall be packed in suitable inside containers designed to prevent rupture and leakage under conditions incident to transportation.

(4) Materials containing radioisotopes of plutonium, americium, or curium, or the isotope strontium-90, shall be packed in containers meeting 100 Specifications 2R.

(1) Liquid radioactive materials will be packed in tight containers or other suitable inside containers. The container will be covered at all sides by an absorbent material sufficient to absorb entire contents and be of such nature that its efficiency will not be impaired by chemical reactions with the contents. Where shielding is required, the absorbent material will be placed within the shield. If inside container meets 100 Specification 2R, absorbent material is not required.

(2) Each outside container label required under 10 CFR 20.203 shall bear the following information:

(a) Total activity, or in the case of source and special nuclear material, total weight.

(b) Principal radioisotopes.

(c) Radiation level at the surface of container and at one meter from the source.

9. PROCEDURE IN CASE OF EMERGENCY.

a. The USARAL Radiological Safety Officer will be notified immediately.

b. In the event of gross contamination of military or civilian personnel, the Radiological Assistance Monitoring and Decontamination Teams (RAMDET) will be requested in support of the USARAL Nuclear Accident-Incident Control Plan (NAICP) through the commanding officer of the nearest Army installation.

c. The reports covering emergency situations listed in 10 CFR 20.403, 20.404, AR 40-502 and AR 385-40 will be forwarded through Headquarters USARAL.

d. Emergencies will probably be of the following types:

(1) Spill of radioactive material.

(2) Explosion.

(3) Fire.

(4) Overexposure.

(5) Injury to personnel.

e. In an emergency, the primary concern must always be the protection of personnel from radiation hazards and secondary concern should be the confinement of the contamination to the local area of the accident if this is possible.

(1) Spills.

- (a) Notify all persons not involved with spill to vacate area at once.
- (b) If spill is liquid and hands are protected, right the container and take steps to contain the spillage.
- (c) If spill is on the skin, flush thoroughly.
- (d) If spill is on clothing, discard outer or protective clothing at once.
- (e) Notify radiological safety officer.
- (f) Decontaminate personnel.
- (g) Decontaminate area.
- (h) Monitor all persons involved in spill and cleaning operation to determine adequacy of decontamination.
- (i) Permit no person to resume work in area until an area survey is made and area is cleared by radiological safety officer.
- (j) Prepare a complete history of accident and decontamination operation related thereto for RMDF records.

(2) Accidents involving radioactive dusts, mists, fumes, organic vapors and gases.

- (a) Notify all other persons to vacate area immediately.
- (b) Hold breath and switch off any air circulating devices; e.g., fans, air conditioners, blowers, etc.
- (c) Vacate area.
- (d) Notify radiological safety officer.
- (e) Close all entrances into area and post conspicuous warning signs or guards to prevent doors from being opened accidentally.
- (f) Immediately report all known or suspected inhalations of radioactive materials to local radiological safety officer and local medical officer.
- (g) Evaluate hazard and safety devices required for safe re-entry.
- (h) Determine cause of contamination and rectify the condition.

(2) Decontaminate area.

(j) Perform area survey (including air samples) of area before resuming normal operations.

(k) Monitor all persons suspected of contamination.

(1) Prepare a complete history of accident and subsequent activity related thereto for RMD records.

(3) Injuries to personnel involving radiation hazards.

(c) Wash minor wounds immediately under running water while standing edges of wound.

(b) Regardless of size of wound, patient will be removed to the nearest medical facility.

(c) Personnel with minor wounds should be monitored and discontinued, if necessary, before leaving RMD. If wounds are of a serious nature, individual will be expeditiously removed to local medical facility. Persons accompanying him will warn medical personnel that there is a possibility that injured individual is contaminated.

(d) Report all personnel radiation accidents (overexposure, burns, ingestion, inhalation, etc.) to local radiological safety officer.

(e) Permit no person involved in a radiation injury to re-enter work without approval of attending physician and radiological safety officer.

(f) Prepare a complete history of accident and subsequent activity related thereto for laboratory records. Forward an information copy to OJ, OH Agency, within three working days of occurrence of incident.

(4) Fires and other major emergencies.

(a) Notify all other persons in area at once.

(b) Attempt to put out fires if radiation hazard is not immediately present.

(c) Notify fire department and other emergency personnel.

(d) Notify radiological safety office.

(e) Radiological safety officer will advise and assist the emergency personnel.

(f) Following emergency, monitor area and determine protective devices necessary for safe decontamination.

(c) Decontaminate.

(h) Monitor all persons who were in emergency area and those who were involved in combating the emergency.

(i) Permit no one to resume work without approval of local radiological safety officer.

(j) Prepare a complete history of the emergency and subsequent activity related thereto for facility records.

(k) Emergency reports. Reports covering the emergency situations listed in 10 CFR 20.403 and AR 40-582 will be complied with as established earlier in this manual. These special reports do not exempt RMDF from reports required by AR 385-40.

10. RECORDS AND ADMINISTRATION.

a. All records will be maintained permanently. Due to the hazardous nature of radioactive material and to federal regulations governing the production, use, release, disposal and presence of radioactive material, the RMDF and its records are subject at all reasonable times to an inspection by the Atomic Energy Commission; The Surgeon General; CBR Agency, Edgewood Arsenal, Maryland or their duly designated representative. Detailed accounting procedures are included in Annex I.

b. Types of Records.

(1) Personnel records of exposure to radiation will be maintained in accordance with AR 40-431 and 10 CFR 20.

(2) Notification of forthcoming shipments. A copy of the shipping instructions furnished by the Chemical Operations Office to shipping units will be forwarded to the operating personnel of the facility as notification of forthcoming shipments of radioactive waste. These instructions will be kept in suspense until the arrival of the shipment and will be used for follow-up in event shipment is not received as anticipated.

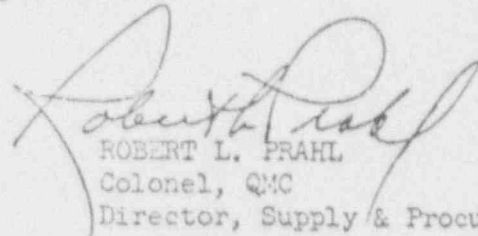
(3) The facility director is responsible but not accountable for material turned over to him for disposal. He will keep records necessary to enable an inspector to trace material from date of receipt to ultimate disposal. Formal accounting records will not be maintained (TM 3-260, Sec XV, para 56)

(4) Records of area and special radiological surveys of RMDF will be maintained. Area surveys and special surveys will be maintained in separate files according to type performed.

(5) Records will be maintained to enable an estimate of the cost of operation per bulk of material received.

(6) Information required to be entered on each voucher of the radioactive material disposal account is as follows:

- (a) Consignor, consignee and locations.
- (b) Date and type of packages received.
- (c) Mr/hr readings at surface and at one meter from package.
- (d) Radiotope(s) present and millicuries of activity of
same, if known.
- (e) Mode of shipment.
- (f) Stock number (if applicable), description of materials,
quantity (number, weight, volume), weight, gross, net cube of package.
- (g) Receiver's voucher number.
- (h) Consignor's report number of voucher number.
- (i) Bill of lading number.


ROBERT L. PRAHL
Colonel, QMC
Director, Supply & Procurement

APPENDIX A

REFERENCES

1. RADIOLOGICAL PROTECTION

- a. AR 40-25, US Army Environmental Hygiene Agency.
- b. AR 40-414, Noncombat Personnel Dosimetry.
- c. AR 40-431, Records of Exposure to Ionizing Radiation.
- d. AR 40-580, Control of Hazards to Health from Radioactive Materials.
- e. AR 40-582, Evaluating and Reporting Internal Exposure to Radioactive Materials.
- f. AR 385-10, Army Safety Program.
- g. AR 385-30, Safety Color Code Marking and Signs.
- h. AR 385-40, Accident Reporting and Records.
- i. AR 700-373, Safe Handling, Storage and Transportation of the Radioactive Source Set, 193.
- j. SS 11-204, Film Badge Dosimetry, Supply & Service for Technical Radiation Exposure Control.
- k. TD MED 232, Radioactive Luminous Compounds, Protective Measures.
- l. TD MED 249, Protection Against Radiations from Sealed Gamma Sources.
- m. TD MED 254, Permissible Dose from External Sources of Ionizing Radiation.
- n. TM 3-220, Chemical, Biological, and Radiological (CBR) Decontamination.
- o. TM 3-260, Operation of Radioactive Material Disposal Facility.
- p. TM 39-20-3, (Classified).
- q. Title 10, Code of Federal Regulations, Atomic Energy Commission.

2. RADIATION DETECTION INSTRUMENTS

- a. TB SIS 226-3, Radiac Detector Charger PP-630/PD and PP-630A/PD.
- b. TB SIS 226-4, Radiac Meter EM-93/PD.

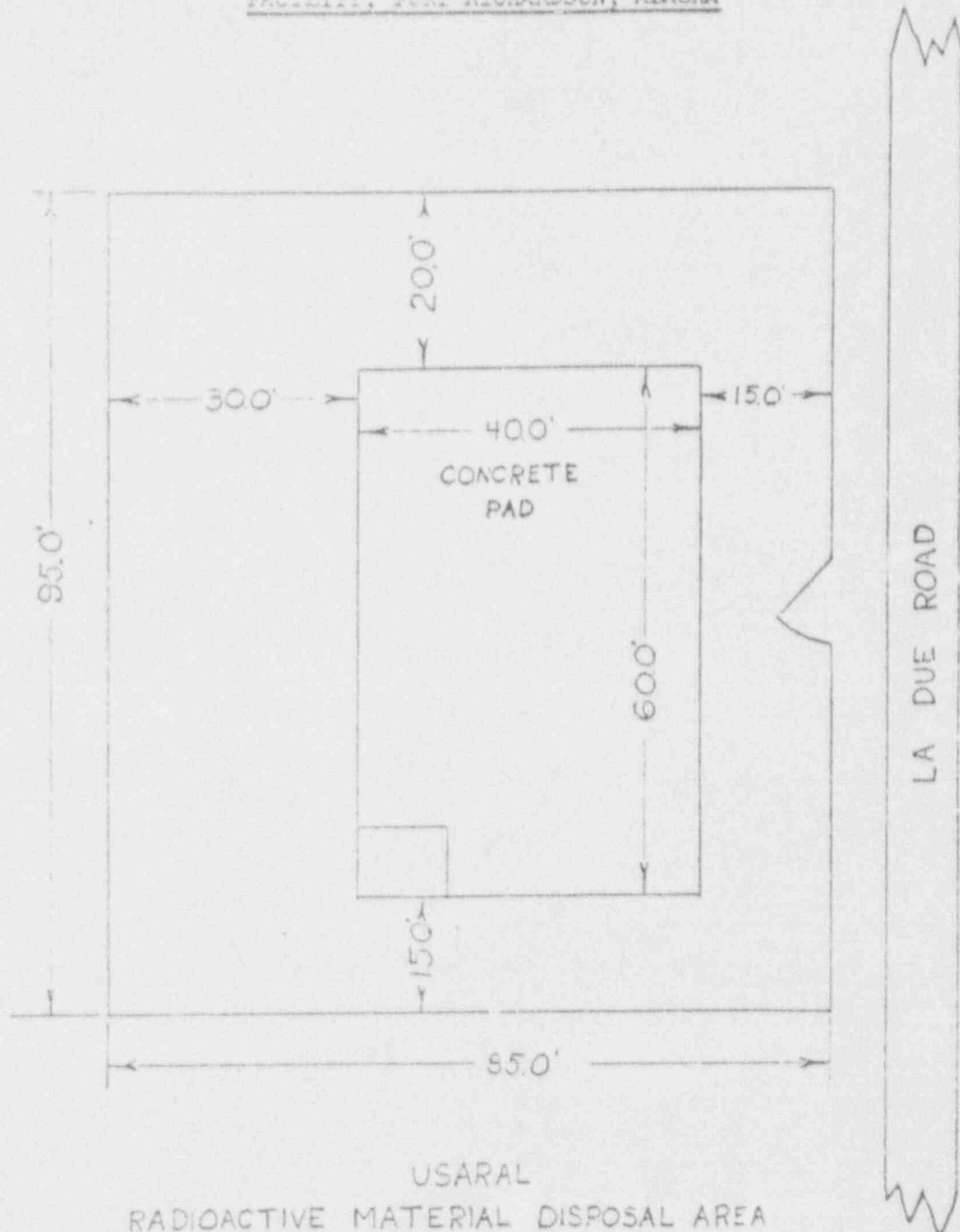
1. TM 313-215-5, Radiac Meter TM-93/UD and TM-147/PD Operation
2. TM 313-225-7, Radiac Meter TM-93/UD and TM-147/PD
3. TM 3-2165-207-12, Operators Organizational Maintenance Manual
Radiac Course Set, 13 (End Item Code 624).
4. TM 11-5514, Radiac Training Sets AN/PDR-T1A, AN/PDR-T1B, and Radiac
Set AN/PDR-39.
5. TM 11-5514, Radiac Sets, AN/PDR-39 and AN/PDR-39A.
6. TM 11-5515, Radiac Sets AN/PDR-27A, -27C, and -27E.

1. RADIOACTIVE MATERIAL

- a. AR 755-330, Disposal of Unwanted Radioactive Material.
- b. Title 16, Part 49 of Code of Federal Regulations.
- c. Title 16, Part 146 of Code of Federal Regulations.
- d. Title 49, Parts 71 thru 73 of Code of Federal Regulations.
- e. Handbook of Federal Regulations Pertaining to Transportation of
Radioactive Materials, AEC.
2. TM 5-534C-1 Metascope Type US/F.
3. TM 50-20-6, (Classified).
4. TM 55-1-11, (Classified).
5. MIL-N-1555A, Markers, Self-Luminous.
6. MIL-C-16-30, Compasses, Lensatic, Luminous Dial.
7. National Bureau of Standards Handbooks Numbers 42, 48, 51, 53,
54, 55, 56, 57 and 73.
8. Entomological Health Handbook, US Department of Health, Education
and Welfare.

ANNEX B

PHYSICAL LAYOUT OF USARAL
RADIOACTIVE MATERIAL DISPOSAL
FACILITY, FORT RICHARDSON, ALASKA



USARAL
RADIOACTIVE MATERIAL DISPOSAL AREA
SCALE 1.0" = 200'

PROTECTIVE CLOTHING AND EQUIPMENT

1. Protective clothing and equipment do not protect the wearer from radioactive contamination and are intended to prevent particles of radioactive material from contacting the body. Protective clothing consists of those items listed in Appendix 1. The USARAF Radiological Safety Officer will recommend the type and the extent that protective clothing and equipment will be used.

2. In order to prevent tracking of radioactive contamination into clean areas, protective clothing used in RDP will be limited to limit its use to one operation. A complete set of clothing is provided for disposal facility personnel to preclude the possible contamination of personal clothing.

3. Protective clothing will be monitored at the end of each work day and accumulated for decontamination if necessary. If decontamination of the clothing to a safe level is impractical, the item will be destroyed as waste.

4. Personnel assigned to RDP will don their protective clothing prior to handling radioactive materials or entering a potentially contaminated area. Protective clothing consists of seasonal disposal facility undergarments and the following where appropriate:

a. Coveralls worn over the top of undergarments. Pockets will be taped shut with masking tape as will be the front seam, trouser and sleeve seams. The sleeve cuffs should be taped over protective gloves.

b. Rubber boots, overboots or similar protective shoe covers will be worn while walking on surfaces known to be contaminated. The protective shoe covers will be removed prior to walking over "clean areas" to avoid tracking the radioactive material.

c. Protective gloves or remote handling tools will be used when handling radioactive materials. Telephones, notebooks and reports should never be handled with contaminated gloves.

d. Rubber aprons will be worn while handling radioactive liquids.

e. Dosimeters.

(1) In addition to the use of film badges, a self-reading pocket dosimeter will be worn per individual. The dosimeters will be used to obtain daily personnel dose information. In the event two dosimeters are worn and doses recorded on the dosimeters differ, and if these dosimeters have been worn in close proximity to one another by the same individual, the higher reading will be used for planning purposes.

(2) Dosimeters which leak 5% of full scale after 24 hours in a radiation-free area will be returned for repair. Each dosimeter should bear a label showing the correction factor which when multiplied by the indicated reading, corrects for the chamber's response to cobalt-60 or radium gamma rays.

temperature and pressure. When the dosimeter is subsequently exposed to a standard radium or cobalt-60 source, the corrected reading is within 20% of the actual exposure. Dosimeters are used to give the worker an estimate of his exposure while receiving the dose in order that he may limit himself to permissible levels.

3. Protective clothing and equipment will be marked with the radiation symbol so as to limit their use for radioactive operations.

APPENDIX I

PROTECTIVE CLOTHING AND EQUIPMENT LIST

1. The following clothing and equipment will be on hand for personnel working within RMLF:

ITEM	NOMENCLATURE	QTY REQUIRED
8435-261-Q1	Coveralls, men's cotton, herringbone twill, 8.5 oz, Shade 17.	2 each per operator
8435-262-Q1	Drawers, men's cotton, white.	2 each per operator
8435-263-Q1	Undershirt, men's, cotton, white.	2 each per operator
8435-733-Q1	Shoes, safety, plain toe, high top.	2 pair per operator
8435-144-Q1	Overshoes, rubber, men's, high, black, cleated rubber outsole and heel, 5 buckle, MIL-O-836.	2 pair per operator
8440-543-Q1	Socks, men's wool, black, MIL-S-48-C.	2 pair per operator
8415-266-8662	Gloves, rubber, men's 10½ in long, black.	2 pair per operator
8405-268-Q1	Cap, field, cotton, wind resistant, poplin, MIL-C-1011A.	2 each per operator
8405-255-Q1	Jacket, field, cotton, wind resistant sateen.	2 each per operator
NON	Apron, chemist's, synthetic resin coated, Fisher Scientific Company.	2 each per operator
840-361-6095	Mack, protective, field, M9A1, cannister, left cheek.	2 each per operator
840-151-3190	Respirator, air filtering, M-5.	2 each per operator
840-310-0034	Respirator filter w/100 extra pads	2 each per operator
8435-266-5016	Tape, pressure sensitive, cloth, CD, 2 in wide (roll).	2 each
841-314-1200	First aid kit, general purpose.	1 each
8435-733-7205	Litter, folding, rigid pole.	1 each
8410-Q1	Shears, metal cutting, hand, 14 in long overall, 3/4 in cut, compound lever.	1 each
NON	Syringe, luer, 10cc capacity.	1 each
NON	Lamp, infrared, 375W, 115-125V.	1 each
8410-343-7615	Alcohol, denatured, Fed-O-E-760b, grade III, 1 gal can.	as required

2. The following equipment will be available for personnel working within RMLF from the Chief, Storage Division, Director of Supply and Procurement:

ITEM	NOMENCLATURE	QTY REQUIRED
3520-237-4869 (or equal)	Truck, lift, fork, gas operated, solid rubber tire.	1 each

	<u>NOMENCLATURE</u>	<u>QTY REQUIRED</u>
100-100-0557	Scale, weighing, platform, caster mounted	1 each

3. The following equipment will be available for personnel working within the MDP from the Director of Services:

	<u>NOMENCLATURE</u>	<u>QTY REQUIRED</u>
100-100-0097 (or equal)	Mixer, concrete, trailer mounted, GED, 4 wheel, pneumatic tire, 16 cf, end discharge.	1 each
100-100-0000	Welding and cutting outfit (Presto-O- Weld, #111 or equal).	1 each
100-100-0410	Decontaminating apparatus, power driven, truck mounted.	1 each

ANNEX D

RADIOLOGICAL SURVEYS

1. Radiation detection instruments consist of those items listed in Appendix 1.

2. Area surveys: Although pre-planning of the operations will help control contamination to a large extent, the RMDF will be surveyed at least once every month or more frequently, if necessary, in order to meet the requirements of 10 CFR 80. The area survey is an evaluation of the radiation hazards incident to the production, use, release, disposal or presence of radioactive material. Such evaluation includes a physical survey of the location of materials and equipment, and measurements of levels of radiation or concentrations of radioactive materials in and around the area. The area survey should be done using radline instruments plus smear and air sampling techniques. The location of the monitoring points should be marked on a scale drawing of the area. The location of the monitoring points together with results and recommendations as to decontamination procedural changes will form the area survey record file.

a. Special surveys:

(1) Incoming shipments of radioactive waste will be monitored for alpha, beta and gamma radiation upon receipt from the carrier. The vehicle delivering radioactive material will be checked for radiation after the shipment is unloaded and radiation levels will be recorded. If necessary, disposal facility personnel will decontaminate the vehicle before releasing it. A certificate shall be attached to the bill-of-lading and given to the driver or agent of the common carrier or in case of military vehicles shall be attached to the trip ticket to certify that the levels of contamination on the interior surfaces of the vehicle are less than 10 milliroentgens per 24 hours for beta-gamma and less than 500 disintegrations per minute per 100 square centimeters for alpha (see Annex H).

(2) Packages of radioactive waste for final disposal will be monitored to assure conformance with ICC regulations.

(3) Prior to, during and after operations in which radioactive material in significant amounts is disposed of by release into the sewerage system, the USARMC Radiological Safety Officer will provide the necessary monitoring.

(4) Any special or unusual operation in which overexposure, internal hazard to personnel or contamination of unrestricted areas is likely to occur will be monitored.

d. General recommendations for radiological survey techniques.

(1) The survey should include a study of the personnel habits and the handling and packaging procedures used in RMDF. The survey should be made under representative conditions and techniques.

- (4) Instruments used for the survey should be properly maintained.
- (5) Written records of all surveys shall be maintained. Copies of records of surveys will be given to the Facility Director.
- (6) Dose rates should be indicated in millirem per hour. Locations of survey points should be marked on a scale drawing of the facility. These positions can be identified by numbers or letters on the scale drawing. The scale can be used to give the dosage rates for these positions.
- (7) The report shall include recommendations as to corrections in operational techniques that will eliminate radiation hazards.
- (8) The surveys should be initiated with the assumption that all types of hazards are present until proven otherwise.

d. Alpha surface contamination monitoring.

(1) General. An alpha particle of greater than 7.5 mev energy is unable to penetrate the protective outer layer of the skin. Few isotopes emit alpha particles of that energy. Therefore, alpha monitoring is aimed at the detection of contamination which might find its way into the body and there do considerable damage because of its high ionizing power. The short range and the penetrating ability of the alpha particle complicate its detection. Thin films of oil or water can partially or completely hide alpha contamination. Porous surfaces (wood and concrete) may harbor several times the activity measurable with a survey meter.

(2) Alpha monitoring methods. Alpha emitters may be monitored with the AM/EM-60 or by means of smear techniques. The smear technique is described in paragraph 2f of this annex. Before initiating alpha monitoring the efficiency of AM/EM-60 should be checked with a standard alpha source. The AM/EM-60 should be used in accordance with the guidance found in the instruction manual. Alpha contamination levels obtained by use of AM/EM-60 should be recorded in terms of counts per minute (CPM) and should be related to dpm or microcuries.

f. Smear technique for alpha, beta and gamma contamination.

(1) The smear technique area monitoring is a procedure used to determine the extent of contamination and whether or not the contaminant is removable. It is thereby presenting a potential contamination control and a means of hazard reduction. The smear procedure consists of smearing a surface with a piece of filter paper and counting the emanations from the smear with a liquid scintillation counter.

(2) This method of surveying contamination permits results to be obtained in areas where the background radiation is high enough to interfere with the use of portable survey meters. Also, this method is more sensitive than most survey meters.

(3) For ease in handling, smear packets are prepared from sheets of paper free from radioactive contamination. The packets are prepared as follows:

- (a) Cut paper into rectangular pieces 2"x4".
- (b) Stack six of these sheets on top of one another.
- (c) Fold the stack in half to form a packet 2"x2".
- (d) Secure the pages of the packet by stapling the packet at a point $\frac{1}{2}$ " from the crease and midway between the two sides.

(4) The smears are prepared by cutting sheets of number 41 Whatman filter paper into discs which will fit the staler. In order to strengthen the paper, the discs may be dipped into saturated table salt solution and dried.

(5) The prepared filter paper smears are inserted between the pages of the packet. Each packet will include 10 smears and 1 blank. The smears are numbered consecutively to permit their identification with the spots monitored.

(6) The individual employing this method will wear a surgical rubber glove on his favored hand. The first and second fingers of the gloved hand are placed on one of the papers and an area of 100 sq cm is smeared. This is roughly equivalent to a square four inches on each side. The number of the smear and the item or location of the spot smeared are recorded. The used smear is returned to its position within the smear packet until it can be taken to the radiological laboratory and counted for alpha and beta-gamma.

c. Air Monitoring.

(1) Atmospheric contamination. Evaluation of the airborne radioactivity incident to the storage and processing of radioactive materials must be part of the radiological survey. Radioactive contaminated air subjects the respiratory system to radiation from the contaminant deposited on the lining of the respiratory tract. Further, soluble radioactive material deposited on the bronchial lining is absorbed directly into the blood stream and is deposited preferentially in selected organs. The radioactive contaminant in the atmosphere will often settle out over "clean" areas in the environment increasing the possibility of internal hazard through ingestion or skin absorption.

(2) Deposition of airborne radioactive particulate matter.

(a) Three major determining factors as to whether or not the particulate matter will be deposited in the respiratory system are: its mass, size and chemical composition.

(b) The probable fate of airborne dust according to the particulate size is tabulated below:

Probable Fate

0.1 microns
2-25 microns
0-3 microns
0.1-3 microns

Probably exhaled
Deposited in nose and throat
Deposited in bronchial tubes
Deposited in alveolar breathing cells
of lungs

(c) Whatman number 41 filter paper has been found to have a filtering efficiency for particles with a size range of 0.18 to 2.1 microns and a low air resistance, therefore, it is used as the filtering medium for air sampling.

(d) Air Sampling Method. There are two types of air sampling methods depending upon where the air sample is taken. They are:

(a) General air sample method. The general air sampling method is one in which an air sample is collected to evaluate the airborne radioactivity of air in rooms or buildings wherein radioactive materials are stored or handled in such a fashion that the airborne contaminants will be fairly distributed.

(b) Breathing zone sampling method. A breathing zone sample of air is collected within one foot of the worker's nose while he is working under conditions representative to the operation being monitored.

(c) Comparison of general air sampling and breathing zone sampling. General air sampling is used to evaluate the air concentration of a radioactive material in a large area. This type of sampling is used to determine the airborne radioactivity resulting from the storage of radium deuterium, which is used to determine whether posting is required. Breathing zone sampling on the other hand evaluates the airborne hazard in which a worker is performing some particular function which may cause the release of contamination of the air. Breathing zone sampling would be used to evaluate the operations to determine the type and extent of respiratory equipment required.

(d) Counting and calculation of the sample.

(a) Determination of air background count. Any air filtered sample will show an appreciable radioactive background due to the radon exhaled from the earth and to the fission products in the air as a result of nuclear reactions. The effect of the fission products and radon daughters is eliminated by adding an air sample of 353 ft³ which is equivalent to 10 m³ of air at a point upwind from F&DT. This sample should be counted within one hour after collection and should be evaluated for alpha and beta-gamma.

(b) Determination of the activity of the air sample. In order to make use of the background correction listed above, air samples collected to evaluate the airborne radioactivity must be counted within 60 minutes after obtaining the sample, however, the background sample and air sample must be held the same amount of time before counting. In the event it

If possible to count the entire paper, a known area taken from the center of the filter paper may be counted. Assuming uniform distribution over the paper, it is necessary to obtain and apply an area correction factor which is the ratio of the total effective filtering area of paper to the filter area of the portion to be counted.

(c) The counts per minute alpha must be corrected by a factor of two due to the 50% alpha activity loss due to filter absorption. Further, both the alpha and the beta-gamma count must be corrected for the efficiency of the counting system. The instrument efficiency factor applied is a factor used to correct the counting rate obtained from a detector to the disintegration rate of the radioactive material being counted. The efficiency factor is determined by counting the activity of a standard and then comparing the result with the actual activity of the standard.

APPENDIX I

RADIATION MEASURING EQUIPMENT

The following radiation measuring equipment will be available to the NSAF from the Chemical Operations Office, Director of Supply and Procurement:

1. Equipment

a. Military:

ICN	DESCRIPTION	RANGE	QUANTITY
6183-234-0199	Dosimeter, DI-9/PD	0-200 mr	6
6555-9-2-1177	Dosimeter Charger, PP-1578/PD		2
6183-518-0303	Beta-Gamma Survey Meter, AN/PDR-27E	0-500 mr/hr	2
6555-326-0043	Gamma Survey Meter, AN/PDR-39	0-50 r/hr	2

b. Commercial:

ICN	DESCRIPTION	RANGE	QUANTITY
6183-K32-0049	Scintillation Alpha Counter, SAC-2	0-1x10 ⁶ cpm	1
6183-K34-1777	Alpha Meter Eberline, PAC-1S	0-1x10 ⁵ cpm	1
6183-K34-1777	Film Badges (Lexington Signal Depot Type)		60
6183-K34-3873	r-Counter, Model 570	0-2.5 r	1
6183-K34-1777	r-Counter, High Energy	0-2.5 r	1
6183-K34-4232	r-Counter, Medium Energy	0-0.25 r	1
6183-K34-1777	r-Counter, Medium Energy	0-1.0 r	1
6183-K34-1777	Staplex Hi-Volume Air Sampler		1

2. Sources, Calibration

ICN	DESCRIPTION	QUANTITY
6183-363-0001	Radioactive Source Set, M-3	1
6183-363-0001	Radioactive Source Set, TS-784/PD	1
6183-363-0001	Radioactive Source, Pu-239	1
6183-712-7535	Radioactive Source, TS-1230/PD	1
6183-K34-4232	Radioactive Source, Set of Five	1
	Th-232, 0.0150 uC on 11/60	
	Co-60, 0.0-55 uC on 11/60	
	Cs-137, 0.0220 uC on 11/60	
	Pu-239, 0.0110 uC on 11/60	
	Tl-204, 0.343 uC on 11/60	

ANNEX E

PERSONNEL MONITORING

1. General. Personnel monitoring includes the use of swipes and scanning of clothing and the body with portable survey meters. In order to be free of the influence of radiation from the stored radioactive material, the personnel monitoring area must be located away from the radioactive material stored in the facility. This is necessary to prevent low levels of contamination from being masked by high levels of background radiation emanated by radioactive material in the radioactive material disposal facility.

2. Swipes:

a. A swipe is the procedure used to determine the presence of contamination and whether or not the contaminant is likely to rub off. A swipe is made by rubbing a piece of absorbent tissue, filter paper, or cheesecloth over the area in question and counting it with laboratory scaler counting equipment. Before being used, the swipe may be moistened with water or an alcohol-water solution. If the swipe has been moistened, it must be dried prior to being counted since the moisture will prevent the alpha particles from being counted; booties, shoe covers and other footwear, appropriately checked after being worn through a contaminated area, can be a good indication of the likelihood of spreading contamination.

(1) Nose swipes, a method of determining the effectiveness of respiratory protection, are made with a 3"x $\frac{1}{2}$ " strip of paper wrapped tightly around the end of a swab stick. Applications are dipped in distilled water and used by the subject to swab each nostril. The swab is placed in an envelope on which is written the date and the individual's name. After drying, the outer 1 inch of paper is counted in a gas-flow proportional counter. If the respiratory protection being used is adequate, the activity on swipes taken for the radiation workers should be comparable to those taken as controls using individuals not working near the radioactive material disposal facility.

b. Personnel Scanning. Personnel monitoring will be done with the AN/PDR-27 and AN/PDR-60. Both meters when used for personnel monitoring may be equipped with earphones to permit aural indication to supplement the slow-needle response. While monitoring, the meters will be turned on their lowest range to achieve the highest electronic sensitivity of the meter. The sensory portion of the meter probe will be placed as close to the portion of the body being examined as possible without bringing the probe into physical contact. The probe should not be moved faster than one linear inch per second. An individual will be considered to be contaminated with alpha emitters if there is any observable needle response on the AN/PDR-60, while checking him with the sensory portion of the AN/PDR-60 probe within one quarter inch of his body. An individual is contaminated with beta-gamma emitters if there is an aural response or if there is 0.1 mr/hr or higher needle response of the AN/PDR-27 when the sensory portion of the probe, with the beta shield open, is placed as close to the skin as possible without touching the skin.

PERSONNEL DECONTAMINATION

1. Thorough washing with nonabrasive soap and tepid water is the best method of decontamination of the hands and other parts of the body for loss of contaminant. If the contaminant is localized, it is often more practical to rub off the affected area and cleanse with swabs, rather than risk the danger of spreading the contaminant by general washing. Organic solvents must be avoided as decontaminating agents because they may increase the probability of the radioactive materials penetrating through the pores of the skin. Special attention must be given to the areas between the fingers and around the nails, also the outer edges of the hands are readily contaminated and often neglected in the washing.

2. After repeated washings the skin will tend to chap. To avoid this, apply lanolin or hand cream and then continue to wash. If repeated washing with soap and water is unsuccessful in the personnel decontamination, the individual should be referred to the local medical officer for application of the more drastic chemical decontamination listed in National Bureau of Standards Handbook 44.

3. In the event several individuals have become contaminated or the contamination on an individual is not localized to a small portion of the body, the following decontamination procedure will be used.

- a. Place individual under a tepid shower.
- b. Using a mild toilet soap, individual will cover entire body with lather.
- c. While still covered with lather, individual will step out of shower.
- d. An assistant will sprinkle a heavy coat of mild soap flakes all over lathered individual. (Purpose of lather is to cause soap flakes to adhere to person).
- e. Using his hands, the contaminated individual will rub the soap flakes on his body into a paste.
- f. Individual will then return to shower and attempt to rinse soap off of his person by starting at the top and working his way down. Note: It will be necessary for individual to rub body surfaces with his hand while rinsing in order to remove soap paste. Soap paste will remain on those areas which have not been thoroughly washed. Although a soft cloth may be used, a brush may not. Particular attention should be given hairy portions of the body.
- g. When the individual has rinsed himself to the point that he no longer feels slimy and while still under shower, he will be examined by an

Remove the traces of soap. The presence of soap will indicate which areas of body have not been decontaminated.

h. After removing all traces of soap, individual will leave the shower and dry himself.

i. After drying off, individual will be monitored. If individual is still contaminated, procedures will be repeated.

ANNEX G

HAZARDOUS AND AREA DECONTAMINATION

1. General.

a. Care must be taken during decontamination process to avoid further spread of the contaminant. This can be accomplished by:

(1) Always working from area of least contamination toward the area of the heaviest contamination.

(2) Taking precautions not to track contamination by use of decontamination, protective clothing and shoe covers.

(3) Using a minimum amount of decontamination liquids, being aware that the run-off solutions, mops, rags and brushes will all be contaminated.

b. The following methods should be tried in the following sequence:

(1) The area is wiped with a damp rag. The wiping surface of the rag is changed repeatedly to minimize spread of contaminant.

(2) The area is wet with a minimum amount of detergent solution, then wiped dry with absorbent gauze or cloth.

(3) Steam Cleaning.

(4) Cleaning with solvents other than water.

(5) Surface removal by use of chemicals, abrasives, sand-blasting, grinding, etc.

2. If preceding decontamination methods do not work, the following specific methods may be tried:

a. Metals:

(1) Remove any oily surfaces with organic solvent.

(2) Soak in a solution of citric acid prepared by adding one pound citric acid to 1 gallon of water.

(3) Use metal polish.

(4) Soak in a solution of diluted hydrochloric acid prepared by carefully adding 1 part of commercial grade concentrated hydrochloric acid to 4 parts of water. Hydrochloric acid should not be used on stainless steel because of the etching which will destroy the smooth surface.

b. Plastics. Clean with ammonium citrate, dilute acids or organic solvents.

c. Glass and porcelain. Clean with detergent solution. If this does not work, soak in concentrated nitric acid or chromic acid cleaning solution.

d. Painted surfaces. Use a paint remover, or in cases where surfaces were coated with a strippable paint, peel paint from surface.

e. Rubber, including respirators, gas masks. Wash with detergent water or with a hot 20% (by weight) water solution of sodium citrate.

3. Decontamination of Clothing:

a. Determine extent of contamination using an AN/PDR-27 with the beta shield removed or AN/PDR-60.

b. Segregate the clothing into two classes: Class 1 for low activity, less than 0.1 mr/hr above background on AN/PDR-27 and 50 counts per minute on AN/PDR-60. Class 2 for activity higher than 0.1 to 10 mr/hr on AN/PDR-27 and 50 counts per minute on AN/PDR-60. Wash in special laundry facility for washing "hot" clothing only. Use the following steps:

(1) Soak overnight in water solution of laundry detergent.

(2) Drain.

(3) Wash for 15 minutes with hot water and powdered soap or laundry detergent.

(4) Dry and remonitor.

ANNEX H

CERTIFICATE OF CAR OR VEHICLE DECONTAMINATION

Letter Head

SUBJECT: Radiation Survey Results

DATE:

1. Reference Bill of Lading No. _____.

2. This is to certify that a radiation survey of the interior surfaces of unloaded Railroad Car No. _____ belonging to _____ (Name of Carrier) indicates that the levels of radioactive contamination are less than 0.40 millirems per hour beta-gamma radiation and less than 500 disintegrations per minute per 100 square centimeters alpha contamination.

(SIGNATURE)

Typed Name and Title of
Radiological Safety Officer

ANNEX I

ACCOUNTING PROCEDURES FOR USARAL
RADIOACTIVE MATERIAL DISPOSAL FACILITY
FORT RICHARDSON, ALASKA

1. GENERAL. The records of all property received, on hand, or disposed of will include a single voucher register, voucher file and stock record card file. Formal accounting records will not be maintained.

a. DA Form 14-110 (Installation Property Record Card), used as stock record card, will be used to record all transactions for radioactive materials and waste. Entries will be made based upon line items received.

b. Radioactive waste materials received by shipping documents (liquids, paper, wood, glass, rubber, metals, cardboards, tiles, carcasses, etc., etc.) will be posted to stock record cards designating the types of radioisotopes. Radioactive waste materials generated at the radioactive material disposal facility by the removal of wrapping, coverings, and outside containers which were used to enclose radioactive material will also be processed into waste inventory records. Combustibles will be segregated from noncombustibles and processed into the records as the quantities are received daily or at close of each working week. Material will be accounted for by method described in 1a, above.

c. Where use of manufacture's serial numbers is required for identification of like items, these numbers will be reflected on all property documents and property record cards, unless specific exemption is provided in Army Regulations.

d. Chemical Corps issue stocks of radioactive material received at the RMDF and which are listed on documents as New-Excellent (N-1 or CRC-1) or satisfactory condition, will be tagged as "New" and segregated from similar unserviceable material. Disposal of such items will be requested from Commanding General, U. S. Army CER Agency, Edgewood Arsenal, Maryland. Disposal requests on new materials (Chemical Corps Issue Stocks) will be admitted when such items are received at the RMDF.

2. VOUCHERS TO A DISPOSAL ACCOUNT.

a. The following vouchers will be used for radioactive material disposal accounts:

(1) Debit Voucher. (Any document indicating receipt of material).

(2) Credit Voucher. (Any document indicating disposal or release of material).

(3) Inventory Adjustment Report (DA Form 444).

Vouchers will be numbered in accordance with the provisions of

3. ISSUING INVENTORY VOUCHERS.

All vouchers evidencing a property transaction in a radioactive material account must be authenticated by the official in charge of the radioactive material disposal facility for authenticating inventory adjustments.

4. VOUCHER REGISTER.

a. DA Form 272 (Register of Vouchers to Stock Record Account) on which all vouchers linking property received, transferred or otherwise disposed of, shall be recorded and will be maintained for each radioactive material disposal facility account. In the box (Account of) at the right of the heading Register of Vouchers to Stock Record, the official designation of the account in which the voucher pertains will be entered, USARAL R/DF, USARAL R/DF, etc.

b. Headings of the columns of the DA Form 272 will not be changed. Additional columns will not be added and it will not be used as a statistical document.

c. Entries on the DA Form 272 may be typewritten or printed in ink, and must be correct at all times and any changes or corrections must be initialed.

d. Vouchers to each account will be numbered serially for each month, beginning in July with the number 1 (e.g., the first voucher for July 1963 is numbered 01-1). Numbers on "adjustment" vouchers will be preceded with the letter "A".

5. FILLING OUT DA FORM 272.

a. In column 1, enter voucher numbers in numerical sequence.

b. In column 2, enter the date on which the permanent voucher is received or filed.

c. In column 3, indicate by use of the appropriate abbreviation the type of document: Shipping Documents (SD), Inventory Adjustment Report (IAR), Property Turn-In (PII).

d. In column 4, enter the name of the installation, organization or activity from which radioactive material was received or to which it was transferred. If the material is released to an outside agency, enter the name of that agency.

e. In column 5, enter the quantity, major noun of item, stock number (wherever applicable), of the first item on the document being processed.

f. In column 6, enter the date on which the voucher number is assigned to the document.

g. In column 7, enter any other office identification number pertaining to the document being registered (e.g., excess report number of consignor and shipping document number) or any other information that improves the clarity of the accounting.

6. CANCELLATION OF VOUCHER NUMBERS.

a. Voucher numbers which are cancelled for any reason after use, will be overprinted "cancelled" and the reason for the cancellation and the signature of the responsible account officer will be entered thereon. If the voucher have been previously posted, the posting will be corrected on the stock record cards to indicate the cancellation. The cancelled voucher will be annotated to indicate the date on which the corrective postings were made and will be filed in the voucher file, in proper sequence, to support the posting. Each cancelled voucher number will not be reused during the fiscal year.

b. At the end of each fiscal year, a red ink entry will be made after the last voucher entry indicating the last voucher number used.

7. LOST OR MISSING VOUCHER.

a. When it is determined after thorough search that a voucher is missing or lost, a statement in lieu of the lost or missing voucher will be placed immediately in the voucher file and the word lost will be entered in column 2, DA Form 272 opposite the voucher number assigned.

b. The statement will include voucher number, name of the consignee or assignor, description of the first item, date on which the number was assigned and any other identification which may be available. It will also include any detailed information concerning the circumstances of loss, as far as they can be determined, and all action taken to locate the voucher or a copy thereof. This statement will be supported by correspondence or other evidence to the extent necessary to verify that all known sources were exhaustively checked for the missing voucher. This statement will be signed by the officer responsible for the account and filed in the voucher file.

8. APPROPRIATE OF VOUCHER FILES.

a. Vouchers will be annotated to indicate that proper postings have been made including initials of the posting clerk and date of entry. The notation will be placed in the right margin of the face of the voucher. Before filing, vouchers should be given final check against postings to insure that postings are complete. The officer responsible for the account will, to the maximum extent possible, practice a systematic preaudit of all vouchers to the account.

2. All vouchers will be filed in an appropriate folder in accordance with AR 780-45 by fiscal year.

3. Vouchers normally will not be removed from voucher file. In a rare instance, when it is necessary to remove a voucher from file, the voucher will be marked by the original of a charge-out sheet and will be filed in a separate follow-up file to insure prompt return of loaned voucher.

4. STOCK RECORD CARDS.

a. Radioactive material stock numbered property will be posted to stock record cards indicating recurring receipts, disposals and transfers. Stock cards will be maintained for each like item having a different radioisotope, such as luminous marker with radium, luminous marker with strontium, etc. Radioactive electron tubes will be on three different stock cards and designated types A, B and C. Radioisotopes containing different radioisotopes will have separate cards. If more than one isotope is present, the predominant amount only will be used for entry on the card. Cards will be grouped by radioisotope type, e.g., radium, strontium 90, cesium 60, etc., and filed in numerical sequence. When stock cards filled, a new one will be prepared and attached to the original, e.g., Page 2, etc. After a property inspection or audit, cards will be filed separately pending the retirement disposition of records.

b. Stock Record cards will be used to account for radioactive material. A separate card will be used for each applicable item as listed in AR 780-45. Cards will be maintained as outlined in paragraph 9a, above, except that the card will include the general nomenclature and unit of measure (e.g., g, mg or other appropriate measures).

5. INVENTORY PROCEDURES.

a. Inventory procedures for on stock record cards (balance on hand) will be maintained semi-annually by the "shut down" method (AR 780-45).

b. Discrepancies disclosed by inventories will be adjusted in accordance with AR 780-45.

6. RETIREMENT OF RECORDS.

Records regarding disposal action will be in accordance with AR 345-210.

BYPRODUCT, SOURCE & SPECIAL NUCLEAR MATERIAL LICENSE

Licensee
Department of the Army
Headquarters, U. S. Army Alaska
APO 949
Seattle, Washington
Material

Entirely amended

(See license for places of use)

Form

License No: 50-10023-1

Date: 6-16-64

Expiration Date: ~~6-30-66~~ 2/5/68

Amendments: /

Docket No. 27-38

Limit

See license for material

Use: To receive, transport, possess, and package waste byproduct, source and special nuclear material and to transfer said material to authorized land burial sites for disposal.

Visits	Rpt'd.
8-5-64	8-5-64
9-1-65	9-17-65
9-22-66	9-22-66
8-1-67	8-8-67
7-19-68	7-22-68
9-17-70	9-22-70

Licensee	Address	License #	Cat.	Pr.
Department of the Army (Alaska)	Fort Richardson	10023-1	D(1)	III

EXPERT SYSTEM LICENSE EVALUATION
EVALUATION REPORT FOR LICENSE 50-10023-01
**** This report is generated from a previous expert system ***
** evaluation done for this license number.

The final ranking for SITE CONTAMINATION is: 547

--Type and form of materials licensed--
Material-- --Form--
ANY BYPRODUCT OR ANY Loose material

--For evaluation purposes, amount of following materials were obtained--
Material-- --Form-- --Amount-- --Unit--
ANY BYPRODUCT OR ANY 100.0000000 CI

Rank of the license based on the loose materials licensed: 301

1. License was for loose materials, or materials handled loose
2. The inclusion of any byproduct material on the license was for the purpose of possessing waste material.
3. There was one identifiable site with this license.
4. Some likelihood that activity could have generated significant contamination
Rank=rank*1.0
5. There was NO verifiable decontamination of the site at closeout. Rank=rank*1.2
6. There was no evidence of releases to the environment.
Rank not changed.
7. Information insufficient to judge frequency of turnover for operation
Rank not changed
8. There was limited use of contaminated waste material in the operation.
Rank=rank*1.2.
9. Contaminated waste material was probably appropriately disposed of. No change in rank
10. There was adequate documentation of the disposition of materials. Rank=rank*0.7

H/1

11. There was no information in file indicating burial or dumping by licensee.
Rank not changed
12. There were no verifiable intermediate decontamination efforts. No change in rank
13. No closeout survey was conducted for this license. Rank=rank*2.
14. There was NOT an NRC FINAL INSPECTION of the facility. Rank not changed.

CATEGORY FOR POTENTIAL SITE CONTAMINATION:
HIGHEST PRIORITY-Category 1A

The final ranking for SITE CONTAMINATION is:	547
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Reviewer's comments concerning license 50-10023-01

This license was apparently for storage, disposal, and packaging of various forms of radioactive waste from nuclear reactor facilities, and possibly from non-Army agencies. In a letter from John R. Carpenter, Acting Chief of the Industrial Support Branch to the USAEC, it was stated that the waste would be forwarded from the facility directly to licensed land burial sites. It also stated that the the USARAL installations would package radioactive wastes resulting from material covered by AEC licenses issued to Army activities, and transfer waste directly to land burial sites. Since the license 50-10023-1 was for possession of the waste, termination was requested. There is no evidence of any survey subsequent or intermediate to the closure of the site, in order to determine the extent of contamination at the site. This license is of a form issued by the AEC which authorized possession of source material, byproduct material, and special nuclear material all under the regulatory authority of a Part 30 (byproduct materials license).

EXPERT SYSTEM EVALUATION WAS BASED ON THE
INVENTORY RECORD IN JOB 0764, BOX 18

Docket -

Licensee: DEPT. OF THE ARMY-US ARMY ALASKA

Address: SEATTLE, WA APO 949

Zip:

State of operation: AK

Site used: FORT RICHARDSON, ALASKA

Disposition information present: OTHER DOCUMENT PRESENT IN FILE
CONTENTS OF OTHER:

According to AEC inspection, all material had been transferred to land burial sites.

This license was listed as terminated on 12/23/70

Remarks: THE DOCKET NUMBER IS 27-38.

* * * JOB NUMBER: 0764 BOX NUMBER: 18
