

ANNEX III

STANDING OPERATING PROCEDURE
NUMBER 755-10-001

OPERATION OF USARL RADIOACTIVE MATERIAL
DISPOSAL FACILITY (RMDF)



STANDING OPERATING PROCEDURE
NUMBER 755 - 10 - 001

HEADQUARTERS
UNITED STATES ARMY, ALASKA
SUPPORT COMMAND
APO Seattle 98749
28 January 1966

OPERATION OF USARAL RADIOACTIVE MATERIAL
DISPOSAL FACILITY (RMDF)

1. PURPOSE. This SOP furnishes procedures for handling, storage, packaging, shipping and accounting for radioactive waste by the USARAL RMDF, Ft. Richardson, Alaska.
2. APPLICABILITY. This SOP is applicable to all persons who work in, visit or otherwise support the operation of the USARAL RMDF.
3. RESPONSIBILITIES.
 - a. Facility Director. The Chief, Chemical Laboratory, USARAL Support Command is responsible for overall operation of the RMDF. He will:
 - (1) Keep the Commanding Officer informed of all matters pertaining to the disposal of radioactive waste.
 - (2) Coordinate all staff actions.
 - (3) Report immediately all accidents, incidents, injuries or overexposures which occur in the operation of RMDF to:
 - (a) Commanding Officer, USARAL Support Command
 - (b) USARAL Radiological Safety Officer
 - (c) Post Safety Officer, Fort Richardson
 - (d) Post Surgeon, Fort Richardson
 - (4) Prepare and submit through channels reports of thefts or accidents required by Section 20.403, Title 10, Code of Federal Regulations.
 - (5) Maintain property records reflecting transactions in RMDF from receipt through processing the ultimate disposal, in accordance with directives from higher authority and this SOP.
 - (6) Prepare other records and reports of radioactive material disposal as required by AR 755-380, TM 3-260 and Parts 20 and 30, Title 10, Code of Federal Regulations.

(7) Insure that proper security of RMDF is maintained and that keys required for entrance into the facility are kept in the Chemical Laboratory Office. Access to the RMDF area is controlled by admission pass and keys are controlled by locked compartment when not in use.

(8) 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.

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

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

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

(12) Supervise personnel and property decontamination.

(13) Insure that radiation exposures of personnel working in or visiting the RMDF are reported to the Custodian of Individual's Medical Records.

(14) Provide necessary laboratory support for RMDF.

b. Chief, Distribution Branch, Logistical Control Center, USARAL Support Command is responsible for furnishing necessary material handling equipment for operation of RMDF.

c. Chief, Ammunition Branch, Logistical Control Center, USARAL Support Command 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.

d. Radiological Safety Officer.

(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 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, Chemical Laboratory, USARAL Support Command is, in addition to being the Facility Director, the Alternate USARAL Radiological Safety Officer.

e. Post Surgeon. The Post Surgeon, Fort Richardson is responsible for the following medical services for personnel who work in RMDF to include:

(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 40-582.

(4) Maintenance of DD Form 1141 (Record of Exposure of 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 40-14).

f. Chief, Electronic Equipment Repair Branch, Maintenance Division, LCC. The repair and field calibration of radiation measuring and detecting instruments will be performed by the Electronic Equipment Repair Branch, Maintenance Division, LCC, USARAL Support Command.

g. Post Engineer. The Post Engineer, Fort Richardson is responsible for furnishing and operating certain equipment as specified in par 6c, Annex B for the packaging of radioactive waste as well as maintenance of the RMDF, to include the concrete pad, buildings, and fence.

4. DEFINITIONS.

a. RMDF. Radioactive Material Disposal Facility.

b. AEC. Atomic Energy Commission.

c. Overexposure. An exposure to ionizing radiation greater than the maximum permissible exposure set forth by AEC and Army Regulations.

5. GENERAL. The RMDF is operated by USARAL Support Command and is located on Storage Pad 45886 in restricted area C. Correspondence concerning radioactive waste should be addressed to Commanding Officer, USARAL Support Command, ATTN: ARCG, APO Seattle 98749. Annex A shows the layout of the RMDF.

6. PROCEDURE.

a. General. Two methods of disposal of radioactive material are authorized.

(1) Release of liquid into sanitary sewage systems. Disposal of radioactive liquids into the sanitary sewage system will be restricted to those liquids generated in the decontamination of personnel, equipment, or surfaces. Criteria established in 10 CFR 20.303 will not be exceeded and records will be maintained to show compliance with these criteria.

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

b. Receipt of Radioactive Material.

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

(2) Upon arrival of shipment, disposal facility personnel will survey waste containers and vehicle in which it arrived. Vehicles which are contaminated will be decontaminated by facility personnel prior to release. The USARAL Radiological Safety Officer will be notified immediately upon discovery of any contaminated vehicle or container, damaged, or improper shipment.

(3) Except in the case of vehicles containing radioactive materials to be delivered to destinations other than RMDF, the driver or in case of railroad cars, the local agent will be given a statement to attach to the trip ticket or bill of lading certifying that the vehicle is free of contamination. The format of the certificate is shown in Annex G.

(4) Contents of shipment will be checked against information listed on shipping document. Any discrepancies will be noted.

c. 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 above waste. It will be stored in the open under protective cover to prevent a build-up of radioactive gases.

(3) Liquid radioactive waste awaiting disposal will be stored in heated storage facilities during those months in which freezing temperatures prevail to prevent freezing and damage to containers.

d. Transportation of Radioactive Waste. (1) Prior to Shipping radioactive waste to RMDF, notification of impending shipment will be sent to the Commanding Officer, USARAL Support Command, ATTN: ARCO, APO Seattle 98749. This notification will be in accordance with the current USARAL Support Command Logistical Manual. Acknowledgement of notification will include any special shipping instructions. Radioactive waste will not be shipped to the RMDF until acknowledgement of notification is received.

(2) Transportation of radioactive material from waste-generating agency to RMDF and from RMDF to designated land burial sites or from generating facility directly to land burial site shall be in accordance with applicable regulations of the Interstate Commerce Commission (ICC), US Army and local and state authorities. Where regulations are not applicable, transportation, including packing, marking and labeling shall be in accordance with paragraph 6e (3).

(3) Each vehicle in which licensed material is transported shall be marked or placarded on each side and rear with lettering at least 3 inches as follows: DANGEROUS-RADIOACTIVE MATERIAL.

(4) In the event of an accident involving any vehicle transporting licensed material, immediate steps shall be taken to prevent exposure of persons to radiation and control the contamination.

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

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

e. 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 RMDF 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 78 of ICC Regulations:

1 15A, 15B, 12B, 6A, 6C, 17C, 17H, 21A, or 21B for the containment of ¹radioactivity 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.

(h) Material containing radionuclides of plutonium, americium, polonium, or cerium or the isotope strontium-90, shall be packed in containers which meet ICC Specifications 2R.

(i) Liquid radioactive waste will be solidified by mixing with concrete and shipped in a solid state.

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

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

(b) Principal radioisotope, the words "Chemical Waste, Not Otherwise Specified", will not be used. If the principle or most dangerous isotope is not known, the use of Mixed Fission Products or Mixed Activation Products is authorized if applicable.

(c) Radiation level at the surface of container and at one (1) meter from the source.

(d) Name and address of the licensee.

f. Radiological Protection. (1) The Radioactive Material Disposal Facility will be posted as required by 10 CFR 20.203, and 20.204 with signs as prescribed in AR 385-30. Every entrance into the area will have the radiation area sign located approximately four feet above the entrance ground level and as close to the entrance as it is feasible. Based upon the results of radiological surveys, the RMDF will be posted with high radiation area signs to delineate the dose rate contours where the dose rate exceeds 100 mr/hr. High radiation areas established for periods longer than 30 days will be equipped with an automatic alarm as required by 10 CFR 20.203 (c) (2).

(2) Operating Personnel will:

(a) Follow prescribed radiological safety precautions.

(b) Wear a film badge and pocket dosimeter (IM-9 or equal) when in RMDF, while handling unprocessed radioactive waste being brought into RMDF, or while handling processed radioactive waste.

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

(d) Wear and use such protective clothing and equipment as directed by the Facility Director, to prevent ingestion of radioactive material and overexposure to external radiation sources.

(e) Report all injuries and accidents occurring in RMDF to Facility Director.

(f) Never enter or work alone in RMDF.

(g) Perform necessary surveys and personnel monitoring (Annexes C & D).

(Annexes E & F). (h) Decontaminate self, areas or equipment as required.

(i) Escort all visitors to RMDF. Visitors will be provided with a film badge and pocket dosimeter (IM 9 or equal).

(j) Insure that smoking, eating, drinking or chewing tobacco or gum within RMDF is not allowed.

(k) Insure that contaminated individuals change to clean outer clothing and are transported to the Radiochemical Laboratory where they will shower and be monitored. In event of an injury, contaminated personnel will be removed from the area under supervision of medical personnel. Clothing will be monitored upon leaving processing area or more frequently as required. Contaminated clothing will be disposed of as radioactive waste.

(3) References in Paragraph 10 are furnished for additional guidance in radiological protection.

E. Procedure In Case of Emergency. (1) The USARAL Radiological Safety Officer will be notified immediately.

(2) In the event of gross contamination of military or civilian property the Radiological Monitoring and Decontamination Teams (CBR Alpha Teams) organized in support of the USARAL Nuclear Accident-Incident Control Plan (NAICP) may be requested through the commanding officer of the nearest Army installation.

(3) The reports covering emergency situations listed in 10 CFR 20.403, 20.405, AR 40-582 and AR 385-40 will be forwarded through Headquarters USARAL.

(4) Emergencies will probably be of the following types:

(a) Spill or radioactive material.

(b) Explosion.

(c) Fire.

(d) Overexposure.

(e) Injury to personnel.

(5) 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.

(a) Spills. (1) Notify all persons not involved with spill to vacate area at once.

(2) If spill is liquid and hands are protected, right the container and take steps to contain the spillage.

(3) If spill is on the skin, flush thoroughly.

(4) If spill is on clothing, discard outer or protective clothing at once.

(5) Notify radiological safety officer.

(6) Decontaminate personnel.

(7) Decontaminate area.

(8) Monitor all persons involved in spill and cleaning operation to determine adequacy of decontamination.

(9) Permit no person to resume work in area until an area survey is made and area is cleared by radiological safety officer.

(10) Prepare a complete history of accident and decontamination operation related thereto RMDF records.

(b) Accidents involving radioactive dusts, mists, fumes, organic vapors and gases. (1) Notify all other persons to vacate area immediately.

(2) Hold breath and switch off any air circulating devices; e.g., fans, air conditioners, blowers, etc.

(3) Vacate area.

(4) Notify radiological safety officer.

(5) Close all entrances into area and post conspicuous warning sign or guards to prevent doors from being opened accidentally.

(6) Immediately report all known or suspected inhalations of radioactive materials to local radiological safety officer and local medical officer.

(7) Evaluate hazard and safety devices required for safe re-entry.

(8) Determine cause of contamination and rectify the condition.

(9) Decontaminate area.

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

(11) Monitor all persons suspected of contamination.

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

(c) Injuries to personnel involving radiation hazards.

(1) Wash minor wounds immediately under running water while spreading edges of wound.

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

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

(4) Report all personnel radiation accidents (over-exposure, wounds, ingestion, inhalation, etc.) to local radiological safety officer.

(5) Permit no person involved in a radiation injury to return to work without approval of attending physician and radiological safety officer.

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

(d) Fires and other major emergencies.

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

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

(3) Notify fire department and other emergency personnel.

(4) Notify radiological safety officer.

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

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

(7) Decontaminate.

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

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

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

(11) 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 H&DF from reports required by AR 385-40.

7. REVISIONS. None.

8. DESIGNATION OF ORIGINATOR. Chief, Chemical Laboratory, USARAL Support Command.

9. CONCURRENCES. a. Post Engineer, Fort Richardson

b. USARAL Radiological Safety Officer

c. Logistics Control Center, USARAL Support Command

d. Post Surgeon, Fort Richardson

10. REFERENCES. a. Radiological Protection

(1) AR 40-4, U.S. Army Environmental Hygiene Agency.

(2) AR 40-14, Control and Recording Procedures
Occupational Exposures to Ionizing Radiation.

(3) AR 700-52, Licensing and Control of Radioactive
Materials.

(4) AR 40-582, Evaluating and Reporting Internal
Exposure to Radioactive Materials.

(5) AR 55-55, Transportation of Radioactive and
Fissile Materials Other Than Weapons.

- (6) AR 385-10, Army Safety Program.
 - (7) AR 385-30, Safety Color Code Marking and Signs.
 - (8) AR 385-10, Accident Reporting and Records.
 - (9) AR 700-323, Safe Handling, Storage and Transportation of the Radioactive Source Set, M3.
 - (10) SB 11-206, Film Badge Dosimetry, Supply and Service for Technical Radiation Exposure Control.
 - (11) TB MED 232, Radioactive Luminous Compounds, Protective Measures.
 - (12) TB MED 249, Protection Against Radiation from Sealed Gamma Sources.
 - (13) TM 3-220, Chemical, Biological and Radiological (CBR) Decontamination.
 - (14) TM 3-260, Operation of Radioactive Material Disposal Facility.
 - (15) TM 39-20-3, (CLASSIFIED)
 - (16) Title 10, Code of Federal Regulations, Atomic Energy Commission.
- b. Radiation Detection Instruments. (1) TB SIG 226-4, Radiac Meter IM 9E/PD
- (2) TB SIG 226-6, Radiac Meter IM 93/UD and IM 147/PD Operation.
 - (3) TB SIG 226-7, Radiac Meter IM 93/UD and IM 147/PD.
 - (4) TM 3-6665-207-12, Operators Organizational Maintenance Manual Radioactive Source Set, M3 (End Item Code 624).
 - (5) TM 11-5543, Radiac Sets AN/PDR 27A, 27C, 27E.
- c. Radioactive Material. (1) AR 755-380, Disposal of Unwanted Radioactive Material.
- (2) Title 14, Part 49 of Code of Federal Regulations.
 - (3) Title 46, Part 146 of Code of Federal Regulations.

(4) Title 49, Parts 71 thru 78 of Code of Federal Regulations.

(5) Handbook of Federal Regulations Pertaining to Transportation of Radioactive Materials, AEC.

(6) TM 5-9340-1, Metascope Type US/F.

(7) TM 30-20-6, (CLASSIFIED).

(8) TM 39-N-11, (CLASSIFIED).

(9) MIL-M-3935A, Markers, Self-Luminous.

(10) MIL-C-1043C, Compasses, Lensatic, Luminous Dial.

(11) National Bureau of Standards Handbooks Number 42, 48, 51, 53, 58, 59, 62, 65, 69, 72, and 73.

(12) Radiological Health Handbook, US Department of Health, Education and Welfare.

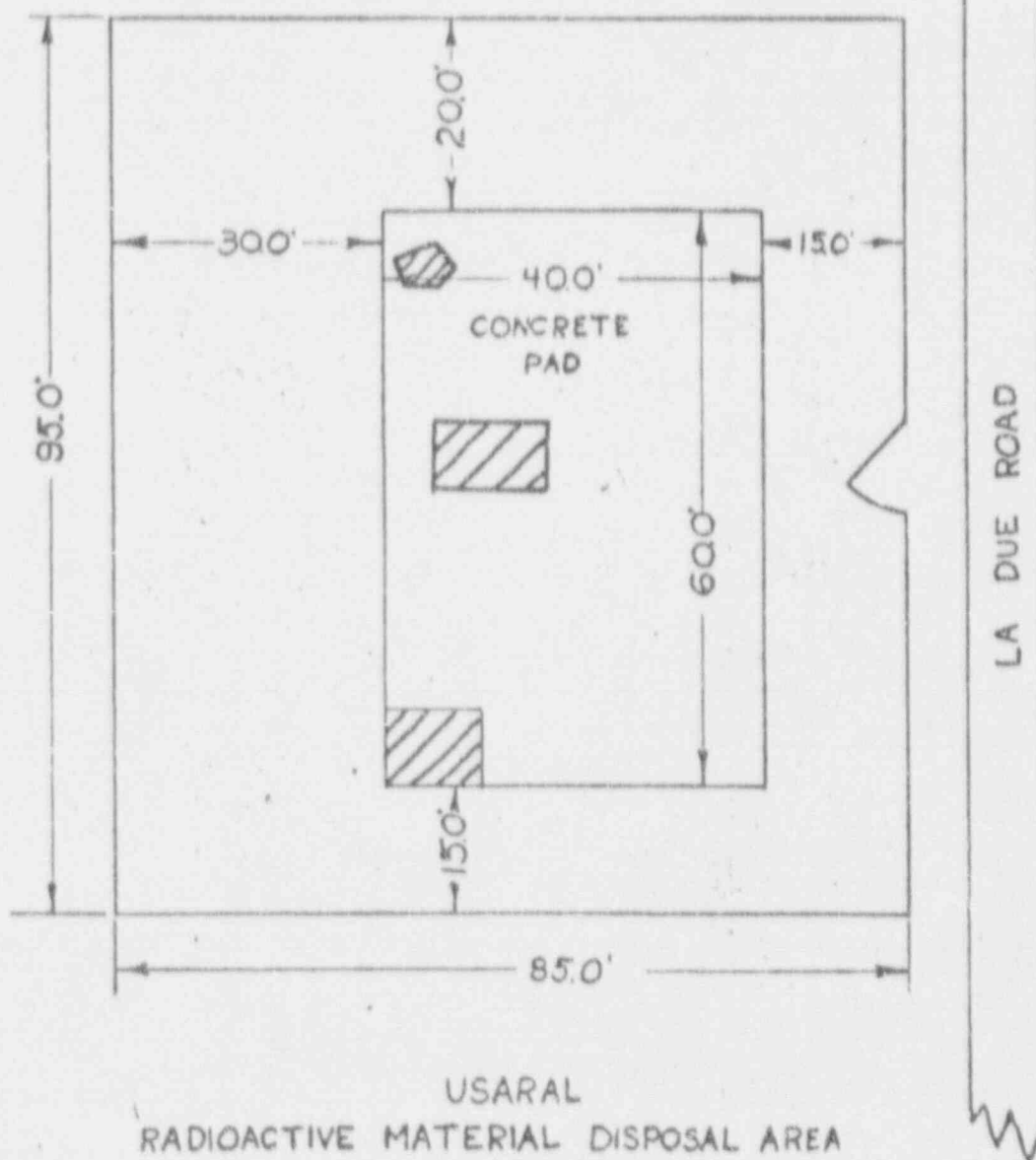
FOR THE COMMANDER:

Julius A. Schallermuller
JULIUS A. SCHALLERMULLER
Major, Arty
Adjutant

ANNEXES: A - RMDF Physical Layout
B - Protective Clothing and Equipment
C - Radiological Surveys
D - Personnel Monitoring
E - Personnel Decontamination
F - Equipment and Area Decontamination
G - Certificate of Car or Vehicle Decontamination
H - Records Administration and Accounting Procedures for USARAL
RMDF, Ft. Richardson, Alaska

ANNEX A

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



USARAL
RADIOACTIVE MATERIAL DISPOSAL AREA
SCALE 1.0" = 20.0'

ANNEX B

PROTECTIVE CLOTHING AND EQUIPMENT

1. Protective clothing and equipment do not protect the wearer from penetrating radiation but are intended to prevent particles of radioactive materials from contacting the body. Protective clothing consists of those items listed in paragraph 6 below. The USARAL Radiological Safety Officer will recommend the type and the extent of protective clothing and equipment that will be used.
 2. In order to prevent tracking of radioactive contamination into clean areas, protective clothing used in RMDF will be marked to limit its use to RMDF operations. A complete set of clothing is provided for disposal facility personnel to preclude the possible contamination 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 RMDF 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 cuffs. The sleeve cuffs should be taped over protective gloves.
 - b. Rubber boots, overshoes 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 by the indicated reading, corrects for the chamber's response to cobalt-60 or radium gamma rays under average temperature and pressure. When the dosimeter is subsequently exposed to a standard radium or cobalt-60 source, the corrected reading should be within 20% of the actual exposure. Dosimeters are used to give the wearer an estimate of his exposure while receiving the dose in order that he may limit himself to permissible levels.

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

6. Protective Clothing and Equipment List

a. The following clothing and equipment will be on hand for personnel working within RMDF.

<u>FSN</u>	<u>NOMENCLATURE</u>	<u>QTY REQUIRED</u>
8405-082-Series	Coveralls, men's cotton, herringbone twill, 8.5 oz, Shade #7.	2 ea per operator
8420-682-Series	Drawers, men's cotton, white.	2 ea per operator
8420-543-Series	Undershirt, men's, cotton, white.	2 ea per operator
8430-753-Series	Shoes, safety, plain toe, high top.	2 pair per operator
8430-144-Series	Overshoes, rubber, men's, high, black, cleated rubber outsole and heel, 5 buckle, MIL-C-836.	2 pair per operator
8440-543-Series	Socks, men's wool, black MIL-S-48-C.	2 pair per operator
8415-266-Series	Gloves, rubber, men's 10½ in long, black	2 pair per operator
8405-261-Series	Cap, field, cotton, wind resistant, poplin, MIL-C-1011A.	2 ea per operator

<u>FSN</u>	<u>NOMENCLATURE</u>	<u>QTY REQUIRED</u>
8405-255-Series	Jacket, field, cotton, wind resistant sateen.	2 ea per operator
8415-082-6108	Apron, chemist's, synthetic resin coated, Fisher Scientific Company.	2 ea per operator
4240-542-4452	Mask, protective, field M-17 cannister.	2 ea per operator
4240-817-9233	Respirator, air filtering, M-5	2 ea per operator
4240-540-0624	Respirator filter w/100 extra pads.	2 per operator
8135-266-5016	Tape, pressure sensitive, cloth, roll	2 each
8135-634-1166	May be substituted for 8135-266-5016	
8135-579-8494	"	"
8135-579-8495	"	"
8135-634-1170	"	"
6542-922-1200	First aid kit, general purpose	1 each
6530-783-7295	Litter, folding, rigid pole	1 each
5110-273-0128	Shears, metal cutting, hand, 1 1/4 in long overall, 3/4 in cut, compound lever.	1 each
NSN	Syringe, luer, 10cc capacity.	1 each
6240-260-0392	Lamp, infrared, 375W, 115-125V	1 each
6810-543-7415	Alcohol, denatured, Fed-O-E-760b, grade III, 1 gal can.	as required

b. The following equipment will be available for personnel working within RMDF from the Chief, Distribution Branch, Logistical Control Center, USARAL Support Command.

<u>FSN</u>	<u>NOMENCLATURE</u>	<u>QTY REQUIRED</u>
3920-257-4869 (or equal)	Truck, lift, fork, gas operated	1 each
6670-164-0556	Scale, weighing, platform, caster mounted	1 each

c. The following equipment will be available for personnel working within the RMDF from the Post Engineer.

<u>FSN</u>	<u>NOMENCLATURE</u>	<u>QTY REQUIRED</u>
3895-238-5097 (or equal)	Mixer, concrete trailer mounted, GED, 4 wheel, pneumatic tire, 16 cf, end discharge.	1 each
3432-ENG	Welding and cutting outfit (Presto-O-Weld, #111 or equal).	1 each
4230-289-3410	Decontaminating apparatus, power driven, truck mounted.	1 each

ANNEX C

SURVEYS

1. Radiation detection instruments consist of those items listed in Annex F.

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 20. 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 radiac 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 miliroentgens per 24 hours for Beta-gamma and 500 dpm per 100 square cm for Alpha radiations.

(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 sewage system, the USARL 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.

b. 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 RMD. The survey should be made under representative conditions and techniques.

(2) Instruments used for the survey should be properly maintained and calibrated.

(3) Written records of all surveys shall be maintained.

(4) 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. A table can be used to find the dosage rates for these positions.

(5) The report shall include recommendations as to corrections in operational techniques that will eliminate radiation hazards.

(6) The surveys should be initiated with the assumption that all types of hazards are present until proven otherwise.

c. Alpha surface contamination monitoring.

(1) General. An alpha particle of greater than 7.5 mev energy is needed 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 low 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 using either the AN/PDR 60 or by means of smear techniques. The smear technique is described in paragraph 2f of this annex. Before initiating alpha monitoring, the performance of AN/PDR 60 should be checked with a standard alpha source. The AN/PDR 60 should be used in accordance with the guidance found in the instruction manual. Alpha contamination levels obtained by use of the AN/PDR 60 should be recorded in terms of counts per minute (CPM) and later converted to dpm or microcuries.

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

(1) The smear technique area monitoring is a procedure used to determine the presence of contamination and whether or not the contaminant is likely to rub off, thereby presenting a potential contamination control and inhalation or ingestion problem. The smear procedure consists of smearing a known area with a piece of filter paper and counting the emanations from the paper with a laboratory scaler.

(2) This method of surveying contamination permits results to be obtained in areas when 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 pocket 2"x2".
- (d) Secure the pages of the packet by stapling the packet at a point $\frac{1}{4}$ " 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 fit the scaler. 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 pocket until it can be taken to the radiological laboratory and counted on scaler for alpha and beta-gamma contamination.

e. 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 subsequently 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:

PARTICLE DIAMETER

PROBABLE FATE

Below-	0.5 microns	Probably exhaled
	8-25 microns	Deposited in nose and throat
	2-8 microns	Deposited in bronchial tubes
	0.5-2 microns	Deposited in alveolar breathing cells of lungs

(c) Whatman number 41 filter paper has been found to have a 98% filtering efficiency for particles with a size range of 0.18 to 2.1 microns and has a low air resistance, therefore, it is used as the filtering medium for air sampling.

(3) 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 building wherein radioactive materials are stored or handled in such a fashion that the airborne contaminate will be uniformly 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.

(4) Comparison of general air sampling and breathing zone sampling. General air sampling is used to evaluate the air concentration within a building or in a storage area. This type of sampling is used to evaluate the airborne radioactivity resulting from the storage of radium devices or from incineration and is used to determine whether posting is required. Breathing zone sampling on the other hand evaluate the airborne hazard incident to the worker while he is performing some particular

function which could give rise to contamination of the air. Breathing zone sampling would be used to evaluate various operations to determine the type and extent of respiratory equipment required.

(5) Counting and calculation of the sample.

(a) Determination of air background count. Any air filtered sample will show an appreciable radioactive background due to naturally occurring radiation. The effect of this determined by taking and air sample of 30 minute duration at a point unwind from RMDF. 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 an air sample. In order to make use of the background correction listed above, air samples taken 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 is impossible 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 following formula will be used to determine airborne radioactive contamination:

$$\text{Activity of Air Sample in uc/ml} = \frac{\left[\frac{(a)(b)(c)(d)}{(f)(g)} \right] - [e]}{1}$$

(a) CPM on scaler minus background

(b) Filter paper absorption factor = 2

(c) Instrument efficiency (Scaler)

(d) $\frac{\text{Total filter paper area in sq in}}{\text{Area of filter paper counted}}$

(e) Air background

(f) $2.22 \times 10^6 \text{ dpm} = 1 \text{ uc}$

(g) $10M^3 = 10^7 \text{ cc} : \text{cpm}/m^3 = \frac{\text{CPM} \times 1000}{\text{CFM} \times T}$

ANNEX D

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 slower needle response. While monitoring, the meter will be placed as close to the portion of the body being checked as possible without bringing the probe into physical contact. The probe would 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 probe held within one quarter of an inch from 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.

ANNEX E

PERSONNEL DECONTAMINATION

1. Thorough washing with nonabrasive soap and tepid water is the best general method of decontamination of the hands and other parts of the body regardless of contaminant. If the contaminant is localized, it is often more practical to mask 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 decontamination 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 medical officer for application of the more drastic chemical decontamination listed in National Bureau of Standards Handbook 48.

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 the 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 hands 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 and assistant for traces of soap. The presence of soap will indicate which area of the 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 F

EQUIPMENT AND AREA DECONTAMINATION

1. General. a. Care must be taken during decontamination process to avoid further spread of the contaminat. 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 monitoring, 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 contamination.

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

(3) Steam Cleaning.

(4) Cleaning with solvents other than water.

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

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

a. Metals: (1) Remove any oily surfaces with organice 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. Plastic. 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 stripable paint, peel paint from surface.

e. Rubber, including respirators, gas masks, wash with detergent water or with about 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.

4. Radiation Measuring Equipment.

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

a. Military:

FSN	NOMENCLATURE	RANGE	QUANTITY
6665-234-8199	Dosimeter, IM 9/PD	0-200 mr	6
6665-542-1177	Dosimeter Charger, PP-1578/PD		2
6665-538-6365	Beta-Gamma Survey Meter, AN/PDR-27E	0-500 mr/hr	2

FSN	NOMENCLATURE	RANGE	QUANTITY
		0-50 r/hr	2
	Alpha Survey Meter AN/PDR-60	0-1X10 ⁵ cpm	1

b. Commercial:

NSN	Scintillation Alpha Counter, SAC-2	0-1X10 ⁶ cpm	1
6665-K52-0049	Alpha Meter Eberline, PAC-1S	0-1X10 ⁵ cpm	1
NSN	Film Badges (Sacramento Army Dept Type)		60
6665-K54-1777	r-Chamber, High Energy	0-2.5 r	1
6665-K54-3873	r-Condenser, Model 570	0-2.5 r	1
6665-K54-4252	r-Chamber, Medium Energy	0-0.25 r	1
6665-K54-1776	r-Chamber, Medium Energy	0-1.0 r	1
NSN	Staplex Hi-Volume Air Sampler		1

c. Source, Calibration

6665-308-3601	Radioactive Source Set, M-3		1
6665-692-6601	Radioactive Source Set, TS-784/PD		1
NSN	Check Source, Pu ²³⁹		1
6665-752-7699	Radio Calibrator, TS-1230/PD		1
6665-K54-4253	Beta Reference Source, Set of Five		1

¹⁴C 0.0150 uC on 11/60
⁶⁰Co 0.0455 uC on 11/60
²¹⁰Bi 0.0220 uC on 11/60
²³⁴Pa 0.0110 uC on 11/60
²⁰⁴Tl 0.343 uC on 11/60

ANNEX G

CERTIFICATE OF CAR OR VEHICLE DECONTAMINATION

The certificate required by paragraph 6b (3) will be in the format shown below:

Letter Head

SUBJECT: Radiation Survey Results

1. Reference Bill of Lading No. _____.

Trip Ticket No. _____.

2. This is to certify that a radiation survey of the interior of unloaded

Railroad Car No. _____

Truck Body No. _____

belonging to _____ indicates that the levels of
(Name of Carrier)
radioactive contamination are less than 0.40 millirems per hour, Beta-
gamma radiation and less than 500 distintegrations per minute per 100
square centimeters alpha contamination.

Signature _____

Type Name and Title of
Local Radiation Protection
Officer

ANNEX H

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

1. General. 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.

b. Types of Records.

(1) Personnel records of exposure to radiation will be maintained in accordance with AR 40-114 and 10 CFR 20.

(2) Notification of forthcoming shipments. A copy of the shipping instructions furnished to shipping units 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 or 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) Radioisotope (s) present and millicuries of activity of each, if known.

(e) Mode of shipment.

(f) Stock number (if applicable), description of materials, quantity (number, weight, volume), weight, gross, net cube of packages.

(g) Receiver's voucher number.

(h) Consignor's report number of voucher number.

(i) Bill of lading number.

c. 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.

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

e. Radioactive waste materials received by shipping documents (liquids, paper, wood, glass, rubber, metals, cardboards, tiles, carcasses, soil, etc.) will be posted to stock record cards designating the types of radioisotopes. Radioactive waste materials generated at the radioactive material disposal facility be 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.

f. 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.

g. 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) serviceability 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 CBR Agency, Edgewood Arsenal, Maryland. Disposal requests on new materials (Chemical Corps Issue Stocks) will be submitted 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).

b. Voucher will be numbered in accordance with the provisions of paragraph 4d.

3. SIGNING PROPERTY VOUCHERS.

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

4. VOUCHER REGISTER. a. DA Form 272 (Register of Vouchers to Stock Record Account) on which all vouchers listing property received, transferred or otherwise disposed of, will 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 to which the voucher pertains will be entered, USARAL RMDP, USARAL Support Command.

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 worksheet.

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

d. Vouchers to each account will be numbered serially for each fiscal year, beginning in July with the number 1 (e.g, the first voucher for Fiscal Year 1963 is numbered 63-1). Numbers on "adjustment" vouchers will be prefixed with the letter "A".

5. ENTRIES ON 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 placed in voucher file.

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 (PTI).

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

e. In column 5, enter the quantity, major noun of item, stock number (whenever 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 has 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 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 coinsignee or consignor, 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 documentary 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. ARRANGEMENT 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. 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.

b. All vouchers will be filed in an appropriate folder in numerical sequence by fiscal year.

c. 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 replaced by the original of a charge-out sheet and will be filed in suspense of follow-up file to insure prompt return of loaned voucher.

9. STOCK RECORD CARDS. a. Radioactive Material stock numbered property will be posted to stock record cards indicating recurring receipts, disposals and transfers. Separate cards will be maintained for each like item having a different radioisotope such as luminous marker with radium. Luminous marker with strontium, metascopes with radium, metascopes with strontium, etc. Radioactive electron tubes will be on three different stock cards and designated types A, B and C. The property 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, calt 60, etc., and filed in numerical sequence. When cards become 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 waste. A separate card will be used for each applicable item as listed in paragraph 1c. Records will be maintained as outlined in paragraph 9a, above, except that the card will include the general nomenclature and unit of measure (lb, gal or other appropriate measures).

10. INVENTORY PROCEDURES. a. Property accounted for on stock record cards (balance on hand) will be inventoried semi-annually by the "shut down" method (AR 780-45).

b. Discrepancies disclosed by inventories will be adjusted in accordance with AR 711-16.

11. DISPOSITION OF RECORDS.

Files recording disposal action will be in accordance with AR 345-210.

