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ENVIRONMENTAL RESTORATION PROJECT

A Department of Energy Environmental Cleanup Program

Environmental Restoration Project
Standard Operating Procedure

for:

Management of Environmental Restoration Project Waste

☑ **NES Approved**

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Management of Environmental Restoration Project Waste

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Management of Environmental Restoration Project Wastes

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the process for managing ER Project waste generated during corrective action activities at the Los Alamos National Laboratory (Laboratory) Environmental Restoration (ER) Project.

2.0 SCOPE

2.1 This SOP is a mandatory document and shall be implemented by all ER Project personnel when they anticipate the generation of ER Project waste.

2.2 The process described herein includes planning and implementation/management requirements associated with ER Project waste management activities.

2.3 This procedure outlines the preparation, approval, and retention of all required documents associated with waste generation.

2.4 This SOP shall be used in conjunction with the most current revision of Laboratory Implementation Requirements (LIRs) and Laboratory Implementation Guidance (LIGs) associated with waste management activities; these LIRs and LIGs include

- LIR 404-00-02, General Waste Management Requirements
- LIR 404-00-03, Hazardous and Mixed Waste Requirements
- LIR 404-00-04, Managing Solid Waste
- LIR 404-00-05, Managing Radioactive Waste
- LIR 404-00-06, Managing Polychlorinated Biphenyls
- LIR 405-10-01, Packaging and Transportation
- LIR 402-700-01, Occupational Radiation Protection Requirements
- LIG 404-00-02, Acceptable Knowledge Guidance
- LIG 404-00-03, Waste Profile Form Guidance
- LIG 404-00-04, Chemical Waste Disposal Request Guidance
- LIG 404-00-05, Preparing the Waste With No Disposal Path Approval Package

Note: The LIRs and LIGs listed above are subject to change. ER Project personnel shall utilize the most current revision of LIRs or LIGs.

Note: Subcontractors performing work under the ER Project's quality program shall follow this SOP for management of ER Project wastes or may use their own procedure(s) as long as the substitute meets the requirements prescribed by the ER Project Quality Management Plan and is approved by the ER Project's Quality Program Project Leader (QPPL) before the commencement of the designated activities**.**

3.0 TRAINING

3.1 ER Project personnel using this SOP are trained by reading the procedure and all applicable Laboratory-wide LIRs and LIGs listed in Section 2.4 above.

Note: All LIRs and LIGs are found on the Laboratory's home page.

3.2 The training shall be documented in accordance with Quality Procedure (QP)-2.2, Personnel Orientation and Training.

3.3 The Field Team Leader (FTL) shall monitor the proper implementation of this procedure and ensure that relevant team members have completed all applicable training assignments in accordance with QP-2.2.

4.0 DEFINITIONS

Note: A glossary of definitions is located on the ER Project internal homepage at http://erinternal.lanl.gov/WritingGuide.shtml

4.1 *Acceptable knowledge (AK)*—A waste stream characterization method that can be used to meet all or part of the waste analysis requirements appropriate for the waste media. The method may include documented process knowledge, supplemental waste analysis data, and/or facility records of analysis. {LIG 404-00-02}

4.2 *Accumulation date*—The date a *hazardous waste* is first generated, or the date that *hazardous waste* collected in a *satellite accumulation area* exceeds 55 gallons of hazardous waste or 1 kilogram of *acute hazardous waste* or 100 kilograms of any residue or contaminated soil, waste, or other debris resulting from the cleanup of a spill, into or on any land or water of any acute hazardous waste.

4.3 *Acute hazardous waste*—Environmental Protection Agency (EPA) hazardous waste number designated with an (H) in the "hazard code" column of Title 40, Code of Federal Regulations (40 CFR) § 261.31-33.

4.4 *Area of contamination (AOC)*—Existing area of continuous contamination of varying amounts and types that are identified on a case-by-case basis.

4.5 *By-product material*—Radioactive material resulting from producing or processing nuclear materials.

4.6 *Committed dose equivalent*—The predicted dose equivalent to a tissue or organ over a 50-year period after an intake of a radionuclide into the body. It does not include dose contributions from radiation sources external to the body. {DOE Order 5400.5}

Note: Committed dose equivalent is expressed in units of rem (or sievert).

4.7 *Committed effective dose equivalent (CEDE)*—The sum of the *committed dose equivalents* to various organs or tissues in the body from radioactive material taken into the body, each multiplied by the tissue-specific weighting factor. {DOE Order 5400.5}

Note: Committed effective dose equivalent is expressed in units of rem (or sievert). {DOE Order 5400.5}

4.8 *Construction and demolition debris*—Materials generally considered to be not water soluble and non-hazardous in nature, including, but not limited to, steel, glass, brick, concrete, asphalt roofing materials, pipe, gypsum wallboard, lumber, and other materials discarded during the construction or destruction of a structure or project. It also includes rocks, soil, tree remains, trees, and other vegetative matter that normally results from land clearing. {Title 20 of the New Mexico Administrative Code, Chapter 9, Part 1, Section 105.T (20.9.1.105.T)}

4.9 *Environmental Media* —Borehole cuttings and core, soil, rock, sediments, surface water, and groundwater that are displaced during corrective action.

4.10 *Hazardous waste*—A *solid waste* that is not excluded from regulation as a hazardous waste and

- exhibits any of the defined characteristics of *hazardous waste* (ignitability, corrosivity, reactivity, or toxicity), or
- is a listed hazardous waste, or
- is a mixture of *solid waste* and *hazardous waste,* or
- is derived from a listed *hazardous waste*. {ER Project Glossary}

4.11 *High-level waste*—A highly *radioactive waste* material resulting from the reprocessing of *spent nuclear fuel*, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations, and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation. {DOE Order 435.1 and LIR 404-00-05}

4.12 *Investigation-derived waste (IDW)*—*Solid* or *hazardous waste* that was generated as a result of investigation/characterization corrective action activities.

Note: *IDW* includes, but is not limited to sample media, personal protective equipment, contaminated sampling supplies, plastic, and decontamination fluids.

4.13 *Low-level waste*—*Radioactive waste* that is **not** classified as *high-level waste*, *spent nuclear fuel*, *transuranic* (TRU) *waste*, *by-product material* (as defined in Section 11e.(c) of the Atomic Energy Act of 1954, as amended), or *naturally occurring and accelerator-produced radioactive material*. {DOE Order 435.1 and LIR 404-00-05}

4.14 *Mixed waste*—Any waste containing both *hazardous waste* and *source*, *special nuclear*, or by *product materials* subject to the Atomic Energy Act of 1954. {LIR 404.00.03}

4.15 *Naturally occurring and accelerator-produced radioactive material*—Radioactive materials that are considered either naturally occurring and are **not** *source*, *special nuclear*, or *by-product material* or are produced in a charged particle accelerator.

4.16 *Non-radioactive waste*—Waste that meets the appropriate release criteria for both surface and volume contamination.

4.17 *Polychlorinated biphenyl (PCB)*—Any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substance. {40 CFR §761.3}

4.18 *PCB remediation waste*—Waste containing *PCBs* as a result of a spill, release, or other unauthorized disposal, at the following concentrations:

- materials disposed of prior to April 18, 1978, that are currently at concentrations greater than or equal to 50 part per million (ppm) PCBs, regardless of the concentration of the original spill;
- materials that are currently at any volume or concentration where the original source was greater than or equal to 500 ppm PCBs beginning on April 18, 1978, or greater than or equal to 50 ppm beginning on July 2, 1979; and
- materials that are currently at any concentration if the PCBs are spilled or released from a source not authorized for use under 40 CFR Part 761. {40 CFR § 761.3}

Note: PCB remediation waste means soil, rags, and other debris generated as a result of any PCB spill cleanup, including, but not limited to

- *Environmental media* containing PCBs, such as soil and gravel; dredged materials (e.g., sediments); settled sediment fines; and aqueous decantate from sediment.

- Sewage sludge containing less than 50 ppm PCBs and not in use according to 40 CFR § 761.20(a)(4); PCB sewage sludge; commercial or industrial sludge contaminated as the result of a spill of PCBs including sludges located in or removed from any pollution control device; or aqueous decantate from an industrial sludge.
- Building and other man-made structures (such as concrete floors, wood floors, or walls contaminated with a leaking PCB or PCB-contaminated transformer), porous surfaces, and non-porous surfaces.

Radioactive waste—Solid, liquid, or containerized gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and is of negligible economic value, considering costs of recovery.

Note: *Radioactive waste* has radioactive surface contamination or volume contamination in excess of the appropriate release criteria.

4.19 *Radiological controlled area (RCA)*—Any area to which access is managed to protect individuals from exposure to radiation or radioactive materials.

Note: For RCAs controlled for surface contamination, a reasonable potential shall exist for contamination to occur at levels in excess of those specified in DOE Order 5400.5, Figure IV-1, or a reasonable potential shall exist for an individual to receive more that 0.1 rem *CEDE* during a year from intakes.

Note: For RCAs controlled for volume contamination, a reasonable potential shall exist for the presence of volume-contaminated materials that are not individually labeled.

4.20 *Radiation Control Technician*—A person who verifies that waste packages meet DOT shipping requirements for external contamination, contact and one-meter dose requirements, through screening and measurements.

Note: An *RCT* implements the Laboratory's Radiation Control Program.

4.21 *Recycled*—A material that is *used, reused*, or *reclaimed*. {LIR 404-00-03}

4.22 *Reclaimed*—A material that is processed to recover usable products or is regenerated. {LIR 404-00-03}

4.23 *Satellite accumulation area*—A designated space for accumulating hazardous and mixed waste where the volume of waste shall not exceed 55 gallons or the volume of acutely hazardous/mixed waste shall not exceed 1 kilogram. {40 CFR § 262.34, 20.4.1.300, and LIR 404-00-03}

4.24 *Segregate*—To separate wastes that can be managed together based on similar characteristics and ultimate handling approach (such as radioactively contaminated vs. *non-radioactive waste*).

4.25 *Site-Specific Health and Safety Plan (SSHASP)*—A health and safety plan that is specific to a site or ER-related field activity that has been approved by

an ER health and safety representative. This document contains information specific to the project including scope of work, relevant history, descriptions of hazards by activity associated with the project site(s), and techniques for exposure mitigation (e.g., personal protective equipment [PPE]) and hazard mitigation.

4.26 *Solid waste*—Any garbage; refuse; sludge from a waste treatment plant, water-supply treatment plant, or air-pollution-control facility; and other discarded material including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. {20.9.1.105.BV and LIR 404-00-04}

Note: Refer to 20.9.1.105.BV for specific exclusions from the definition of solid waste.

Note: LIR 404-00-04 contains specific requirements for managing solid waste.

4.27 *Source material*—Material containing any combination of uranium or thorium in any physical or chemical form or ores containing 0.05% or more uranium, thorium, or both.

Note: *Source material* excludes *special nuclear material*.

4.28 Special nuclear material— Plutonium or uranium enriched to a higher-than-natural assay. *Special nuclear material* includes plutonium-239, uranium-233, uranium containing more than the natural abundance of uranium-235, or any material artificially enriched in one of these isotopes.

4.29 *Special waste*—Solid waste identified in the New Mexico Solid Waste Management Regulations (20.9.1.105. BZ) as requiring unique handling, transportation, or disposal to assure protection of the environment and the public health, welfare, and safety.

Note: *Special waste* includes: treated formerly characteristic hazardous waste, asbestos waste, ash, infectious waste, sludge, industrial solid waste, spill of a commercial chemical product, dry chemicals that become characteristic hazardous waste when wetted, and petroleum-contaminated soil.

Note: LIR 404-00-04 contains specific requirements for managing special waste.

4.30 *Spent nuclear fuel*—Fuel that has been “burned” (irradiated) in a nuclear power plant’s reactor to the point where it no longer contributes efficiently to the nuclear chain reaction.

Note: Spent fuel is hot and highly radioactive.

4.31 *Surface contamination*—Radioactive contamination present on the surface of material in excess of the appropriate release criteria.

4.32 *Transuranic waste*—*Radioactive waste* containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the EPA, does not need the degree of isolation required by 40 CFR Part 191 disposal regulations; or (3) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61. {DOE Order 435.1 and LIR 404-00-05}

4.33 *Use or reuse*—A material that is either employed as an ingredient in an industrial process to make a product or employed in a particular function or application as an effective substitute for a commercial product. {LIR 404-00-03}

4.34 *Volume contamination*—Radioactive contamination dispersed throughout a matrix in excess of the appropriate release criteria.

Note: Examples of volume contamination are contaminated liquids and soils, materials activated by irradiation (e.g., beams of charged particles), and smelted metals (i.e., where the smelting process incorporates radioactive material into the matrix of the metal).

4.35 *Waste generator*—ER Project person, by site, whose act or process produces *hazardous waste* or whose act first causes a *hazardous waste* to become subject to regulation. {40 CFR §260.10 and Title 20 of the New Mexico Administrative Code, Chapter 4, Part 1, Section 100 (20.4.1.100) and LIR 404-00-03}

Note: The definition above is specific to hazardous waste because it is defined in the hazardous waste management regulations. The specific responsibilities of a waste generator for any other type of waste are provided in LIR 404-00-03.

4.36 *Waste Management Coordinator (WMC)*—The person responsible for coordinating waste-management activities on behalf of waste generators, line managers, facility managers, Field Project Leaders, the Waste Management Groups, and other Laboratory organizations. {SOP 1.10, Waste Characterization}

Note: The specific functions of a WMC are provided in LIR 404-00-02.3, General Waste Management Requirements.

4.37 Waste management record—A complete package of documents constituting the written record for a *waste stream*.

4.38 *Waste staging*—The accumulation of *radioactive waste* to facilitate transportation, transfer, treatment and/or disposal. { LIR 404-00-05 and LIG-404-00-04}

4.39 *Waste stream*—A group of wastes from one site than can be managed together because of the similar characteristics and ultimate handling approach.

5.0 BACKGROUND AND PRECAUTIONS

5.1 This SOP shall be used in conjunction with an approved SSHASP. Consult the SSHASP for information on and use of all PPE.

Note: Potential waste management hazards (i.e., chemical, radiological, and physical) at each waste-generating site are documented in the SSHASP. Hazards that are not addressed in the SSHASP (i.e., pinch points, drum and container lifting and moving, etc.) are addressed and documented at tailgate safety meetings.

5.2 This SOP shall be used in conjunction with the appropriate waste management LIRs and LIGs with the following exceptions:

- municipal refuse and routine office trash;
- wastes managed by another Laboratory group under a Facility Tenant Agreement; and
- wastes managed by the Laboratory's maintenance contractor.

5.3 Documentation and characterization requirements beyond those described in this procedure may exist for the Laboratory's treatment, storage, and disposal (TSD) facilities or off-site TSD facilities.

5.4 The waste generator or the waste management coordinator shall verify the most recent documentation requirements and facility waste acceptance criteria **prior** to waste characterization or waste profile form submittal to avoid redundant or unnecessary activities.

5.5 Conflicting requirements between this document and other regulations or criteria shall be resolved by implementing the requirements that are regulatory drivers.

Note: Identified discrepancies shall be noted to the author of this procedure so that they can be included in subsequent revisions of this SOP.

5.6 This SOP does not address all conceivable situations. For waste management assistance, contact a waste management coordinator or the Regulatory Compliance Focus Area.

6.0 RESPONSIBLE PERSONNEL

The following personnel are responsible for activities identified in this procedure.

6.1 Author

6.2 ER Project personnel

6.3 Focus area project leader (FAPL)

6.4 Quality Program Project Leader

6.5 Regulatory Compliance Focus Area (RCFA) representative

6.6 Subcontractors

6.7 Supervisor

6.8 Team leader

6.9 Waste management/minimization coordinator

6.10 Waste management coordinators

6.11 Waste generator

6.12 Radiological control technicians

6.13 Waste hauler

7.0 EQUIPMENT

7.1 Descriptions of commonly used forms are given below. These forms are required to document waste management activities.

7.1.1 Waste Characterization Strategy Form (WCSF). This form and requirements for completing it are provided in ER-SOP-01.10. The WCSF documents site history, field activities, and the characterization approach for each waste stream managed. The Laboratory's waste operations group uses the information provided on this form to classify waste.

7.1.2 Waste Profile Form (WPF). A form used by the Laboratory's waste operations group to document the characterization of any solid, hazardous, radioactive, or mixed waste.

7.1.3 Chemical Waste Disposal Request (CWDR) Form. A form used by the Laboratory's waste operations group to describe packages of waste that require collection and management by a permitted facility, relative to a specific WPF.

7.1.4 Land Disposal Restriction (LDR) and Underlying Hazardous Constituents Notification. A form used by the Laboratory's waste operations group to identify applicable LDR notification requirements

and list underlying hazardous constituents present in characteristic hazardous waste.

Note: This form shall accompany documentation required to ship hazardous waste. The form can be downloaded from the waste management coordinator home page associated with the Laboratory's waste operations group.

7.1.5 Forms and Equipment Checklist provided as Attachment A.

7.2 Commonly used equipment is listed below.

Note: Equipment may vary between waste classifications, e.g., labels and signs.

7.2.1 Waste management area signage, as appropriate. Signs include "Satellite Accumulation Area" (SAA), "less-than-90-day accumulation area", "New Mexico Special Waste storage area", "universal waste storage area", or "Radioactive Waste Area" as appropriate.

7.2.2 Labels as appropriate. Labels may include "Hazardous Waste," "New Mexico Special Waste," "PCBs," "Asbestos," "Radioactive Wastes," or Department of Transportation (DOT) labels.

7.2.3 Item identification numbers.

Note: A block of item identification numbers can be obtained from the Laboratory's waste operations group.

7.2.4 Eye wash, shower, or water supply source of adequate volume and pressure to accommodate decontamination of personnel.

7.2.5 Spill control equipment as appropriate. This equipment may include regular or nonsparking shovels, absorbent, broom, container, secondary containment pallets, and plastic sheeting.

7.2.6 Fire extinguishers as appropriate. Fire extinguishers are required for less-than-90-day accumulation areas that store ignitable waste. The type of extinguisher shall be appropriate for the waste being stored.

7.2.7 Tools as needed. Tools that may be needed include a bung wrench, hammer, socket wrench and sockets, wire brush, screwdriver, pliers, and non-sparking tools.

7.2.8 Scales or other equipment to weigh containers.

7.2.9 Barricade tape/rope and stands to cordon off/delineate storage area.

7.2.10 Waste containers that meet DOT shipping requirements for the waste.

7.2.11 Pallets for drummed waste to prevent deterioration of containers and provide for stable storage.

7.2.12 PPE as appropriate. PPE may include gloves, eye protection, protective coveralls, respirator, etc.

Note: Specific PPE will be identified in the SSHASP.

7.2.13 Decontamination equipment as appropriate. Decontamination equipment may include spray washers, brushes, water, wipes, and tub/bucket.

8.0 PROCEDURE

Note: ER Project personnel may produce paper copies of this procedure printed from the controlled-document electronic file located at http://erinternal.lanl.gov/home_links/Library_proc.shtml. However, it is each person's responsibility to ensure that they use and are trained to the current version of this procedure. The author may be contacted if text is unclear. The Document Control Coordinator (DCC) may be contacted if the author cannot be located.

Note: Deviations from SOPs are made in accordance with QP-4.2, Standard Operating Procedure Development, and documented in accordance with QP-5.7, Notebook Documentation for Environmental Restoration Technical Activities.

8.1 All waste types and classifications shall be managed in accordance with LIRs/LIGs specified in Section 2.0 and the following subsections.

8.2 Waste Identification and Characterization

8.2.1 Waste characterization shall be adequate enough to comply with on-site or off-site waste acceptance criteria.

8.2.2 Characterization of ER Project wastes shall be completed through a specified process (refer to Section 8.2.3 for a description of the process).

8.2.3 This process requires the completion of a WCSF in accordance with SOP 1.10 prior to starting the field activities that would generate waste, and includes the following steps:

- Review historical site documentation;
- Develop a waste analysis suite and identify test methods to identify and quantify potential contaminants, or use acceptable knowledge based upon existing site data, as in the case of some types of IDW or environmental media;
- Specify the type of sample(s) to be collected;

- List the anticipated amount of waste, per type expected to be generated as part of the ER Project activity;
- List packaging requirements;
- Identify preliminary classifications of wastes to be generated.

8.2.4 The WCSF shall be updated when

- a new waste type or classification not previously identified on the form is generated,
- a strategy changes, or
- a field activity changes.

8.2.5 The WMC shall complete the WCSF. The draft WCSF will be submitted for review and signature by the Laboratory's waste operations group, the ER Project FTL, the ER Project waste management coordinator, and a representative of the RCFA.

8.2.6 A signed WCSF or amendment shall be retained in the WMC's files and the ER Records Processing Facility.

8.2.7 The generators of waste with no disposal path shall prepare an approval request package prior to the generation of this waste (LIR 404-00-02). The generator, with assistance from the ER Project waste management/minimization coordinator, shall work closely with the Associate Laboratory Director for Nuclear Weapons – Materials and Manufacturing to submit an "Approval Request Package" to the Department of Energy (DOE).

8.2.7.1 Approval by the DOE to generate waste without a disposal path is good only for the current fiscal year. Therefore, the generator assisted by the ER Project waste management/minimization coordinator, shall provide an annual report summarizing steps taken to manage and find disposition for any waste without a disposal path that has been previously approved by DOE, which shall be updated every year.

8.3 Waste minimization/recycling.

8.3.1 Generators are required to reduced in volume of waste generated by as much as is technically and economically feasible.

8.3.2 Specific waste minimization/recycling requirements and guidance are provided in LIR 404-00-02.

Note: Contact the waste management/minimization coordinator for assistance with waste minimization/recycling.

8.3.3 Waste minimization/recycling shall be reported to the ER Project waste management/minimization coordinator at the end of field operations. This information is included in an annual plan, the Waste Minimization Awareness Plan, and is a requirement of Module VIII of the Laboratory's Hazardous Waste Facility permit.

Note: The Environmental Stewardship Office (ESO), Waste Minimization Success Story Form can be used for this purpose. A copy of the form is available on the LANL ESO web page.

8.3.4 ER Project personnel shall ensure that metals from radiological controlled areas are managed for disposal or are recycled **within the DOE complex** only. On July 13, 2001, the Secretary of Energy issued a memorandum suspending the recycling of metals (into consumer products) from radiological areas.

8.4 Waste generation/storage.

8.4.1 Means to store, control, and transport each potential waste type and classification shall be determined prior to the start of field operations that generate waste.

8.4.2 Waste generation/storage requirements shall comply with the appropriate LIRs identified in Section 2.0.

8.4.3 Small amounts (less than six gallons) of decontamination water determined **not** to be hazardous or mixed waste may be discharged directly on-site provided these discharges are unlikely to generate leachate that will move directly or indirectly into groundwater and provided that Water Quality Control Commission groundwater protection standards are met. Discharge of decontamination water that meets these requirements does not require a Notice of Intent (NOI) to discharge.

8.4.4 A waste storage area shall be established prior to generating waste. Requirements for establishing storage areas are specified in LIRs listed in Section 2.0 and shall be implemented. Requirements may differ for each waste type and classification; therefore, ER Project personnel shall plan to manage all waste types/classifications specified in the WCSF. Vehicle traffic, site drainage, accessibility for container-handling equipment, site egress for emergency access, fire protection, and personnel radiological exposure shall be considered for siting a storage area.

8.4.5 The general location of the waste storage area shall be specified on the WCSF.

8.4.6 Waste storage areas in publicly accessible locations shall be fenced and locked.

8.4.7 Waste stored in SAAs or less-than-90-day accumulation areas shall comply with LIR 404-00-03.

8.4.8 Waste storage areas located in controlled areas of the laboratory shall be controlled as needed to prevent inadvertent addition or management of wastes by unauthorized personnel.

8.4.9 Spill control equipment is required for less-than-90-day accumulation areas and is recommended for SAAs.

8.4.10 Equipment listed in Section 7.2.4 is **required** for less-than-90-day accumulation areas that store liquids. This equipment is recommended for SAAs that store liquid waste.

8.4.11 Liquid hazardous or mixed waste shall be stored on a level area with sufficient engineered secondary containment to retain one full container volume of liquid and the force of an immediate breach. Secondary containment design for containers exceeding 2,000 gallons shall be documented in a field logbook in accordance with QP-5.7.

8.4.12 Each container of waste generated shall be individually labeled as to waste classification, item identification number, and radioactivity (if applicable), immediately following containerization.

8.4.13 After a sample has been used for its intended purpose, it no longer enjoys an exclusion under 40 CFR § 261.4(d). Returned contaminated sample material shall be characterized and managed as waste. Management requirements for the returned samples are dependent on the waste classification.

Note: When possible, the sample material shall be added to the same waste stream that generated the sample and stored with other waste generated during the ER Project activity. Refer to Section 8.10.2.2 in regards to returning environmental media samples to their point of origin.

8.4.14 Containers of radioactive waste with a total activity over 2nCi/g are subject to additional labeling and transportation requirements in accordance with Title 49, Code of Federal Regulations (49 CFR), Part 173.

8.4.15 Each storage area or container shall have a posted authorized user list or key control. Absolute control shall be maintained while adding, removing, sampling, labeling, or shipping waste.

8.4.16 At the end of daily field activities, an inspection shall be conducted to confirm that all waste containers are properly closed, stored on level ground, and screened for radiological contamination. This inspection shall be documented in a field logbook in accordance with QP-5.7.

8.4.17 Containerized waste shall meet appropriate DOT requirements.

8.4.18 The waste storage duration for hazardous and mixed waste, special waste, PCB waste, and radioactive wastes are regulated and shall be adhered to.

8.4.19 If no preliminary determination can be made as to waste classification, the waste shall be managed as hazardous waste in accordance with Section 6.4.1 of LIR 404-00-03.1. Once analytical results are received, a determination shall be made as to waste classification and appropriate management requirements. If the waste classification was not previously identified on the WCSF, it shall be amended to reflect the current condition.

8.4.20 Empty containers that held radioactive material in excess of 2nCi/g total activity are required to have a DOT specified “EMPTY” label placed on the container.

8.4.21 Additional storage area requirements may exist for high explosives and TRU wastes.

Note: Contact either a representative from the RCFA or the Environment Safety and Health Division, Solid Waste Group (ESH-19) for additional information.

8.4.22 In all cases, waste documentation and waste classification shall be coordinated with the Laboratory’s waste operation group.

8.4.23 Release of waste/materials from an RCA.

8.4.23.1 Releasing waste/material from an RCA shall be conducted in accordance with LIR 402-700-01, which establishes release criteria.

8.4.23.2 All suspected radioactively contaminated waste/material shall be sampled or surveyed for radioactivity and disposal.

8.4.23.3 Suspected radioactively contaminated waste/material shall be managed in accordance with all applicable LIRs, LIGs and DOE orders.

8.4.23.4 Surface and volume contamination levels for the purpose of potentially releasing non-radioactive material for public landfill disposal, beneficial use, or recycle (termed free release) will be determined with assistance from the

Environment Safety and Health Division, Health Physics Operations group (ESH-1).

8.4.23.5 Free release shall be performed by qualified personnel in accordance with the following ESH-1 standards:

- ESH-1-02-02, Surveying for Fixed and Removable Contamination; and
- ESH-1-03-04, Supporting Documentation, Decontrolling, and Decommissioning of Facilities.

8.4.23.6 If routine and straightforward radiological protection activities normally performed by ESH-1 are performed by other organizations/individuals, a Radiological Surveillance Authorization Agreement, in accordance with ESH-1-01-03, shall be approved and complied with.

8.4.23.7 Radiological survey records and daily operational logbooks shall be maintained by the ER Project FTL and/or RCT at the site in accordance with ESH-1-01-12, Management of Radiological Records and ER QP-5.7.

8.5 Segregation.

8.5.1 Proper segregation is essential for appropriate storage, treatment, or disposal of waste. Appropriate segregation eliminates the potential of mixing incompatible wastes.

8.5.2 All waste shall be segregated by classification and compatibility to prevent cross-contamination. Classifications of waste include, but are not limited to:

- Hazardous waste;
- New Mexico special waste;
- Low-level waste;
- TRU waste;
- Mixed waste;
- Solid waste; and
- PCB waste.

8.5.3 Liquid, sludge, and solid physical form wastes shall be segregated.

8.5.4 Adequate space or a physical barrier shall be left between various waste classifications and any incompatible waste streams within a classification.

8.6 Waste treatment.

8.6.1 ER project activities may generate wastes that will require treatment prior to disposal.

8.6.2 All planned waste treatment, either “generator treatment” of hazardous or mixed waste, or other treatment activities shall be coordinated and approved by ESH-19 prior to implementation.

8.7 Authorized Release Limits.

8.7.1 On January 7, 1997, DOE Headquarters issued a memorandum that addresses the issue of establishing authorized release limits for disposal of hazardous and solid waste containing low levels of radioactivity as residual materials at non-licensed Resource Conservation and Recovery Act (RCRA) permitted facilities. As required by the guidance, the ER Project shall submit a draft request simultaneously to ESH-19, the Laboratory’s waste operations group, and DOE-Albuquerque. The transmittal of the finalized request shall be submitted to the appropriate state regulatory entity where the treatment or disposal site resides. Authorized Release Limit requests are handled on a case-by-case basis.

8.8 Packaging/transportation.

8.8.1 All waste shall be packaged in accordance with the appropriate LIRs and LIGs listed in Section 2.0 of this document.

8.8.2 All waste shall be packaged to meet the on-site and/or off-site waste acceptance criteria, as appropriate.

8.8.3 All waste containers shall be labeled as to the chemical and radiological hazards in accordance with DOT requirements.

8.8.4 The WMC shall take appropriate measures to accurately identify the weight of containers to ensure that the DOT rating for maximum container weight is observed. The WMC shall be able to measure or estimate the weight of the container (tare weight of the container plus contents) within +/- 10% of the actual weight. When practical, a calibrated scale shall be utilized to establish container weight. However, when mobilization or use of a scale at a field site is not practical, the following table shall be used as a reference guide to accurately estimated container weights.

Container Type	Tare Weight
55 gallon steel OH drum	55 pounds (lbs)
55 gallon steel CH drum	50 lbs
30 gallon steel OH drum	35 lbs
30 gallon steel CH drum	30 lbs
Metal B25 box	895 lbs
Metal B12 box	520 lbs
Waste Type	**Average Density**
Soil (in Los Alamos)	10-12 lbs/gallon
Aqueous solution (decontamination water	8.3 lbs/gallon
Concrete	20 lbs/gallon
Sampling debris, PPE	0.5 lbs/gallon
Base course	13 lbs/gallon

8.8.5 For radioactive waste, DOT radiological screening data shall be obtained immediately following containerization, at the end of the daily field activities, or as specified in the Site Specific Radiological Work Permit. This data shall include external package contamination, contact dose rate, and one-meter dose rate.

8.8.6 Used containers can be reused if the container is inspected in accordance with Department of Transportation requirements.

8.8.7 Rusted, dented, or otherwise damaged containers shall **not** be used for waste packaging.

8.8.8 New waste containers with adequate testing and documentation for a specified packaging class shall be obtained from either Business Operations Division, Materials Management Group or the Laboratory's waste operations group. Obtaining containers from these sources ensures that the appropriate procurement quality assurance is in place.

8.8.9 No more than 1% solid physical form material shall be present in a container containing liquid waste.

8.8.10 No more that 1% free liquid shall be present in a container containing solid physical form waste.

8.8.11 Some commercial disposal facilities require that containers be "sealed" by the generator prior to shipment. The date the container was sealed shall be recorded in a field logbook in accordance with QP-5.7.

8.8.12 Radioactive waste shall be packaged to fill the container to greater than 90% capacity. Radioactive waste not meeting the 90% void space requirements shall be repackaged into smaller containers.

Note: Bulk packaged waste and liquid waste are exempt from this requirement.

8.8.13 The labeling and placarding instructions provided in the Shipping Documents prepared by the Laboratory's waste operations group shall be followed. A record of appropriate vehicle placarding and container labeling shall be documented in a field logbook in accordance with QP-5.7.

8.8.14 Waste transportation can be coordinated directly with the disposal facility or through the Laboratory's waste operations group. Transportation shall be through an approved carrier in accordance with DOE's Motor Carrier Qualification Program.

8.8.15 Waste containers shall be inspected prior to shipment and the evaluation shall be documented in accordance with QP-5.7.

8.8.16 All containers shall be secured by the waste hauler prior to transportation.

8.8.17 The generator shall submit copies of the Uniform Hazardous Waste Manifest, special waste manifest, non-hazardous waste manifest, and other shipping papers such as bills of lading, as applicable, to the Records Processing Facility (RPF) in accordance with QP-4.4, Record Transmittal to the Records Processing Facility (refer to Section 10.2.5).

8.9 Disposal options.

8.9.1 Disposal can be coordinated directly with the disposal facility or through the Laboratory's waste operations group.

8.9.2 Disposal facilities used by the ER Project and its contractors shall be approved by the Laboratory's waste operations group prior to shipment. A list of approved disposal facilities can be obtained from the ER Project WMC.

8.10 Specific ER Project Policies. The ER Project will manage wastes in accordance with DOE orders and state and federal regulations, but where possible, the following specific policies may be implemented.

8.10.1 Area of contamination policy.

8.10.1.1 This policy allows certain discrete areas of generally dispersed contamination to be considered RCRA units. Because it is equated to a RCRA land-based unit, consolidation and in-situ treatment of hazardous waste within an area of contamination is allowed without triggering land disposal restrictions or minimum technology requirements. Therefore, these activities would not create a new point of hazardous waste generation if carried out within the designated area of contamination.

8.10.1.2 The area of contamination policy may be applied to any hazardous remediation waste (including non-media wastes) that is in or on the land.

8.10.1.3 Areas of contamination are identified on a case-by-case basis.

8.10.1.4 Any proposed area of contamination shall be approved in advance by the RCFA leader or designee.

8.10.1.5 An area of contamination may require administrative authority notification and/or approval. The RCFA leader or designee shall make the determination of whether administrative authority notification and/or approval are required.

8.10.2 Environmental media.

8.10.2.1 Environmental media is not considered to be a solid waste in the sense of being abandoned, recycled, or inherently waste-like. Thus, the “mixture” and derived-from” rules do not apply to environmental media. However, environmental media that has been classified as a hazardous or mixed waste is subject to regulatory requirements.

8.10.2.2 Environmental media may be returned to its point of origin under the following conditions.

- The environmental media does not leave the solid waste management unit boundary or designated area of contamination boundary except for return samples containing environmental media that have **not** been chemically or physically altered.

- The return of the environmental media does not enhance the potential for contaminant migration.

8.10.2.3 Any environmental media returned to its point of origin shall be documented in a field logbook in accordance with QP-5.7.

8.10.2.4 Environmental media shall **not** be returned to its point of origin if any of the following conditions exist.

- The source of the media is a borehole in hydraulic communication with groundwater or surface water.
- The environmental media could be construed to be refuse in a waste course, or could potentially exceed the New Mexico Water Quality Standards.
- The environmental media encountered was not what was anticipated to be encountered (e.g., visual contamination noted, odor noted, or field screening instruments determine that contamination is present).

8.10.2.5 Well development and purge water are considered environmental media and may be managed under New Mexico surface and groundwater regulations and discharged through an approved NOI provided they are not considered hazardous or mixed waste. The NOI shall be approved by the regulatory authority prior to discharge.

8.10.3 Contained in policy.

8.10.3.1 Environmental media contaminated with hazardous waste shall be managed as hazardous waste until the media no longer “contains” the hazardous waste. Environmental media “contains” hazardous waste when:

- It exhibits a characteristic of a hazardous waste; or
- It is contaminated with concentrations of hazardous constituents from listed hazardous waste that are above health-based levels.

8.10.3.2 Environmental media is considered to no longer “contain” hazardous waste when:

- It not longer exhibits a characteristic of hazardous waste; or
- Concentrations of hazardous constituents from listed hazardous waste are below health-based levels.

8.10.3.3 In the case of environmental media that "contains" a characteristic hazardous waste, the determination that the environmental media no longer "contains" the hazardous waste can be made through relatively straightforward analytical testing and requires no formal determination by the regulatory authority. The environmental media shall **not** be diluted to meet this requirement.

8.10.3.4 For environmental media contaminated with hazardous constituents from listed hazardous waste, ER Project personnel shall submit a letter to the regulatory agency along with all applicable data to justify that the hazardous constituents are below health-based levels. The letter shall be approved by a representative of the RCFA prior to submission to the regulatory agency.

Note: Contact a RCFA representative for information about how to justify that hazardous constituents (from listed hazardous waste present in the environmental media) are below health-based risk levels.

8.11 Perform Lessons Learned

8.11.1 During the performance of work, ER Project personnel shall identify, document, and submit lessons learned, as appropriate in accordance with QP-3.2, Lessons Learned, located at http://erinternal.lanl.gov/home_links/Library_proc.shtml.

9.0 REFERENCES

ER Project personnel using this procedure shall become familiar with the contents of the following documents to properly implement this SOP.

- ER Project Quality Management Plan located at http://erinternal.lanl.gov/home_links/Library_proc.htm
- ESH-1-02-02, Surveying for Fixed and Removable Contamination,
- ESH-1-03-04, Supporting Documentation, Decontrolling, and Decommissioning of Facilities.
- ESH-1-01-03, Radiological Surveillance Authorization Agreement
- ESH-1-01-12, Management of Radiological Records
- LIR 402-700-01, Occupational Radiation Protection Requirements
- LIR 404-00-02, General Waste Management Requirements
- LIR 404-00-03, Hazardous and Mixed Waste Requirements

- LIR 404-00-04, Managing Solid Waste
- LIR 404-00-05, Managing Radioactive Waste
- LIR 404-00-06, Managing Polychlorinated Biphenyls
- LIR 405-10-01, Packaging and Transportation
- LIG 404-00-02, Acceptable Knowledge Guidance
- LIG 404-00-03, Waste Profile Form Guidance
- LIG 404-00-04, Chemical Waste Disposal Request Guidance
- LIG 404-00-05, Preparing the Waste With No Disposal Path Approval Package
- ER-QP-2.2, Personnel Orientation and Training
- ER-QP-3.2, Lessons Learned,
- ER-QP-4.2, Standard Operating Procedure Development
- QP-4.4, Record Transmittal to the Records Processing Facility
- ER-QP-5.7, Notebook Documentation for Environmental Restoration Technical Activities.
- ER-SOP-1.04, Sample Control and Field Documentation.
- ER-SOP-1.08, Field Decontamination of Drilling and Sampling Equipment.
- ER SOP 1.10, Waste Characterization.

40 CFR Parts 260-270

40 CFR Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.

49 CFR Part 173, Shippers—General Requirements for Shipments and Packagings.

PLAN-WASTEMGMT-02, R3.2, LANL Waste Acceptance Criteria

DOE Order 5400.5, Radiation Protection of the Public and the Environment.

State of New Mexico Hazardous Waste Management Regulations (20 NMAC 4.1), Title 20, Environmental Protection, Chapter 4 Hazardous Waste, Part 1, Hazardous Waste Management.

State of New Mexico Solid Waste Management Regulations (20 NMAC 9.1), Title 20, Environmental Protection, Chapter 9 Solid Waste, Part 1, Solid Waste Management.

DOE Manual 435.1, Change 1, Radioactive Waste Management Manual.

United States Environmental Protection Agency, “Management of Remediation Waste Under RCRA,” (Solid Waste and Emergency Response Division, *EPA530-F-98-062,* October 1998).

10.0 RECORDS

10.1 The WMC is responsible for submitting a completed Waste Management Record Checklist (Attachment A) along with all documents checked in the checklist to the RPF (processed in accordance with QP-4.4).

10.2 ER Project personnel are responsible for submitting the following records to RPF in accordance with QP-4.4.

10.2.1 Completed and reviewed notebook.

10.2.2 Notebook attachments and/or data, applicable

10.2.3 Completed document signature form.

10.2.4 Radiological survey records.

10.2.5 Waste management documentation that includes a copy of the appropriate forms listed in Attachment A, information provided for the Waste Minimization Awareness Plan, and a copy of the generator’s copies of the Uniform Hazardous Waste Manifest, special waste manifest, non-hazardous waste manifest, and other shipping papers such as bills of lading, as applicable.

11.0 ATTACHMENTS

Attachment A: Forms and Equipment Checklist, available on the ER internal home page at http://erinternal.lanl.gov/Quality/user/forms.asp (1 page)

Using a token card, click here to record "self-study" training to this procedure.

If you do not possess a token card or encounter problems, contact the RRES-ECR training specialist.

Forms and Equipment Checklist

Forms:

- ☐ Waste Characterization Strategy Form
- ☐ Waste Profile Form.
- ☐ Chemical Waste Disposal Request Form
- ☐ Land Disposal Restriction and Underlying Hazardous Constituents Notification

Equipment:

- ☐ Waste management area signage
- ☐ Labels
- ☐ Item identification numbers
- ☐ Eyewash, shower, or water supply source
- ☐ Spill control equipment
- ☐ Fire extinguisher
- ☐ Misc. tools
- ☐ Scale or other equipment to weigh container(s)
- ☐ Barricade tape/rope
- ☐ DOT specified shipping container(s)
- ☐ Pallets
- ☐ Personnel protective equipment
- ☐ Decontamination equipment

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