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SECTION 013529.29 – HAZARDOUS, MIXED, AND RADIOACTIVE WASTE MANAGEMENT SPECIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. The subcontractor shall provide, in the performance of LBNL waste management activities all labor, materials, equipment, services, and supervision required to manage all generated construction/demolition wastes and secondary project wastes in accordance with all applicable federal, state, local, and LBNL polities to protect the environment and the safety and health of its employees, the employees of its lower-tie Subcontractors, LBNL employees, and the public. The vintage of the buildings, historical and current operations at LBNL indicate the potential generation of wastes consisting of asbestos containing materials (ACM), lead-based paint (LBP), radioactive materials, polychlorinated biphenyls (PCBs), Resource Conservation and Recovery Act (RCRA) regulated hazardous materials, State of California regulated hazardous materials, and Universal waste materials. For a waste type overview, see Appendix A: waste type, definition, management, disposal guidelines.
- B. Section includes the requirements related to waste generation, characterization, certification, treatment, storage, packaging, transportation, and disposal
- C. Related Requirements:
 - 1. Resource Conservation and Recovery Act (RCRA)
 - 2. Toxic Substances Control Act (TSCA)
 - 3. DOE Order 458.1–Radiation Protection of the Public and the Environment
 - 4. DOE Order 435.1 “Radioactive Waste Management”
 - 5. 40 CFR 761, Subpart D, Polychlorinated Biphenyls
 - 6. 49 CFR 171, 172 and 173 Hazardous Materials Transportation
 - 7. California Code of Regulations Title 22, Division 4.5, Environmental Health Standards for
 - 8. Management of Hazardous Waste
 - 9. California Health and Safety Code, Division 20, Chapter 6.5, Hazardous Waste Control

1.3 REFERENCES:

- A. General:
 - 1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
 - 2. Unless otherwise noted, the edition of the referenced code or standard that is current at the time of the “date of record” for the Work shall be considered the effective code or standard for the duration of the project.
 - 3. Refer to Division 01, Section 010000, General Requirements, for the list of applicable regulatory requirements.
 - 4. Division 01 Section 017419, Construction Waste Management
 - 5. LBNL EHS Procedure IP02, Agreement between LBNL and DOE Berkeley Site Office,
 - 6. LBNL Implementation of DOE Metal Release Suspension
 - 7. LBNL EHS Technical Note WMG 02, Classification and Handling of PCB Waste

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8. LBNL EHS Procedure 800, Waste Management Plan for Large Quantity and Non-routine Generated Waste.
9. LBNL EHS Procedure 708, Survey of Potentially Contaminated Materials and Equipment for Unrestricted Release
10. Soil Management Plan for LBNL
11. Radioactive Soil Management Plan for LBNL (under-development)
12. EHS Procedure TP-5024A, Radiological Assessment Methods for Soil and Sediment
13. LBNL EHS Records Management Plan for the Environmental Service Group, Environmental Radiological Protection, and Environmental Restoration Programs
14. LBNL Environmental Health and Safety Manual, Chapter 20, Waste Management, Chapter 9, Emergency Preparedness, Chapter 36, Asbestos Hazards and Controls, Chapter 37, Lead Hazards and Controls and Chapter 38, Beryllium Hazards and Controls
15. LBNL/PUB-3140, Integrated Environment, Safety, & Health Management Plan
16. LBNL/PUB-5519(4), Lessons Learned and Best Practices Program Manual
17. Project Specific Waste Management Quality Assurance Plan
18. LBNL/PUB-3111, Operating and Quality Management Plan
19. DTSC/DOE Combined Waste MOA, California Department of Toxic Substances Control and
20. United States Department of Energy Governing the Regulation of Combined Waste at Department of Energy Facilities in California
21. Waste Treatment, Recycling and Disposal Facilities Waste Acceptance Criteria U.S. Department of Energy, DOE
22. Radioactive Waste Management Basis for the Lawrence Berkeley National Laboratory
23. Radioactive Waste Management Basis Matrix for the Lawrence Berkeley National Laboratory
24. Lawrence Berkeley National Laboratory Environment, Waste & Radiation Protection
25. Department of Transportation Safety Document

1.4 SUBMITTALS

- A. General:
 1. The Contractor shall submit to the University completed, legible electronic copies of the submittals identified below for review and acceptance by the University.
- B. Waste Management Quality Assurance Program Plan (WMQAPP)
 1. Subcontractor must submit WMQAPP and field activities must not start until WMQAPP has been approved by LBNL.
 2. Additional Subcontractor work submittals to LBNL may include but are not limited to;
 - a. Draft and final offsite waste profiles and receiving facility correspondence, and shipping documents, plus any associated regulatory reports, requests and correspondence
 - b. Waste characterization documentation; sampling and analysis results and other supporting documentation
 - c. Waste tracking and waste storage area inspection documentation

1.5 WASTE MANAGEMENT QUALITY ASSURANCE PLAN

- A. The subcontractor's QA plan will describe project organizational structure and responsibilities. The description defines the lines of communication, an integrated work process and identifies key personnel assigned to various activities pertaining to waste management requirements and associated field elements.
- B. Subcontractor WMQAPP must include following elements:
 1. Reviews and Assessments
 - a. The subcontractor Waste Management organization must conduct management assessments to ensure workers meet requirements specified in procedures and documents. These assessments must include line management self-assessments and functional

- manager assessments. To evaluate the effectiveness of the quality program, trained and technically knowledgeable personnel not having direct responsibility for the areas they are assessing must conduct assessments in accordance with written plans or procedures.
- b. LBNL will review the Subcontractor's operations as work proceeds to assure personnel compliance with requirements for managing each waste from the point of generation until disposal. Frequency of reviews will be determined based on the subcontractor's quality of performance. A finding that significant improvement is needed will result in more frequent reviews.
 - c. The review will assess the subcontractor waste management program documents, plans and procedures including the following specific items:
 - 1) Waste Program implementation: Program documents, plans and procedures
 - 2) Waste characterization: Processes used, applicable sampling plans, review of analytical results
 - 3) Training: Waste generator, Department of Transportation (DOT) packaging, DOT shipper, hazard determination, training records
 - 4) Waste Storage: Radioactive and hazardous waste storage,
 - 5) Waste packaging: DOT containers and container management
 - 6) DOT hazardous material and waste shipments: Transporters and shipping documentation, records management
 - 7) Off-site waste receiving facilities: Profiles, Waste Acceptance Criteria
 - d. Conformance/Non-Conformance and Resolution
 - 1) The subcontractor waste management organization must take action when there is a failure to meet external or internal requirements, laws, regulations, or compliance documents or specifications. This action may include immediate correction of the deficiency. Deficiencies and their corrections will be documented according to established requirements. Failures will be analyzed to identify systemic weaknesses in management. LBNL project director/manager must be notified as soon as practicable when any major waste management deficiencies are found. The subcontractor must comply with the requirements for issues management as prescribed in LBNL/PUB-5519(4), Lessons Learned and Best Practices Program Manual.
 - e. Waste Management Procedures
 - 1) The Subcontractor will be responsible for developing and implementing all applicable waste management programs, plans and procedures including but not limited to; required training, record keeping/waste tracking requirements, and quality assurance and compliance program plans.
 - 2) Applicable documentation will include processes for identifying and completing required additional waste characterization, selecting treatment and disposal sites, developing waste profiles, transportation of waste to processing and disposal sites, and mobilizing and managing all qualified personnel and resources required on site to administer the waste programs.
 - f. Waste Management Matrix
 - 1) The subcontractor waste management organization will prepare and maintain a Waste Management Compliance Matrix (matrix). This matrix must at a minimum, identify the following:
 - a) Each waste stream anticipated during the Project. For each waste stream, applicable regulatory and oversight requirements regarding the handling, temporary staging/storage, packaging, transportation, and receipt at off-site receiving facilities
 - b) How Subcontractor is implementing each waste stream specified requirement
 - c) Key individuals, including their specific roles and responsibilities for each waste stream.
 - 2) Subcontractor will add new waste streams identified during Project work activities to the matrix prior to generation. For the life of the Project, the matrix will be maintained and updated when specific waste stream information changes and waste streams are added.

- 3) The Subcontractor will provide the matrix to LBNL representatives on a regular basis as defined in the waste management plan (WMQAPP) and it will form the basis for LBNL/DOE/Contractor discussions regarding management of project waste streams. As such the matrix as well as associated project waste inventories must be maintained current and reflect the appropriate amount of detail necessary (and as it becomes available) to manage each identified waste stream and generated waste containers.
- 4) Additional Subcontractor work submittals to LBNL may include but are not limited to
 - a) See section 1.4
- g. Subcontractor Waste Management Personnel Training and Qualifications
 - 1) Qualifications of the assigned Subcontractor Waste Manager and waste management personnel include but limited to
 - a) Knowledge of the Federal hazardous waste regulations and their applicability.
 - b) Excellent written and verbal communications as well as skills to interact and work effectively with operations subject matter experts (SME)
 - c) Experience in the EPA/RCRA/DOE/California regulatory compliance and implementation related to waste management generally, and hazardous, radioactive and mixed waste specifically.
 - d) Knowledge and experience in the management of regulated demolition wastes
 - e) Current DOT and RCRA training
 - f) Professional registration or certification in specialty area
 - g) Initial 24/40hr HAZWOPER training and current Annual 8-hour refresher training.
 - h) DOE radioactive waste regulations/requirements
 - i) Knowledge of State of California regulations
 - 2) In addition to other applicable training (e.g. DOT, radiation protection and other specific health and safety training) affected project personnel must be trained as hazardous waste generators and in compliance with Title 22, Section 66265.16 if potentially hazardous waste will be generated on the project.
- h. Subcontractor Waste Management Personnel Roles and Responsibilities
 - 1) Subcontractor waste management plans and procedures must be sufficiently detailed so all involved personnel clearly understand their waste management responsibilities and include specific steps required to manage each waste from the point of generation until disposal.
 - 2) Subcontractor plans will describe and define responsibilities by title for project tasks such as the following:
 - a) Preparing DOE Order 435.1 exemption packages
 - b) Preparing termination of safeguards memos for accountable nuclear materials.
 - c) Preparing accountable special nuclear material inventory transfer forms
 - d) Performing quality control or QA inspections and waste verification activities
 - e) Preparing hazardous waste determinations.
 - f) Storing and labeling waste and waste containers
 - g) Performing sampling and analysis activities
 - h) Preparing profiles for receiving facilities
 - i) Receiving, inspecting, and using DOT containers
 - j) Preparing UHWMs
 - k) Completing bills of lading, 540/541 forms, Land Disposal Restrictions notifications/certifications, and related documentation
 - l) Reviewing shipping and receiving facility documents
 - m) Performing pre-/post-shipment notifications and activities, including transmitting UHWMs to State of California and tracking return of signed UHWM from offsite receiving facilities
 - n) Performing waste certification activities
 - o) Submitting and maintaining records

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PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 RADIOACTIVE WASTE

- A. The Subcontractor will be responsible for developing and implementing plans and procedures that address Project-specific radioactive waste management elements such as release, clearance and waste disposal activities.
- B. The Subcontractor must have written sampling and survey protocols for characterization and release of waste under the guidance of DOE Order 458.1 and applicable LBNL policies, plans and procedures.
- C. The disposal of LLW is subject to the Atomic Energy Act, which is administered at Berkeley Lab by DOE's Office of Science in accordance with DOE Order 435.1.
- D. Radioactive waste management activities must comply with the LBNL Radioactive Waste Management Basis document and the Memorandum of Agreement between the California Department of Toxic Substances Control and United States Department of Energy Governing the Regulation of Combined Waste at the Department of Energy Facilities in California ("DTSC/DOE Combined Waste MOA").

<NTS: California Executive Order D-62-02 imposed a moratorium on the disposal of all demolition materials from licensed facilities having low residual levels of radioactivity – even when the materials meet applied federal and state cleanup standards – into Class III or unclassified waste management units.>

3.2 WASTE CHARACTERIZATION

- A. Contractor waste management organizations are to be responsible for characterizing all waste from the Project and ensuring that requirements of Berkeley Lab's waste management program, plans, and procedures, as well as meeting the requirements of the receiving facilities' waste acceptance criteria (WAC).
- B. All project materials discarded, abandoned or declared waste will be properly characterized, accumulated, stored and disposed.
- C. To the extent possible, use the following processes when characterizing waste:
 - 1. documented process knowledge evaluations and
 - 2. existing sampling and analysis results
 - 3. Historical evaluation
 - 4. Previous analytical
- D. Use, when additional analytical characterization is needed a written Sample Analysis Plan, specifying:
 - 1. Data Quality Objectives (DQOs) and Criteria for Measurement Data (CMDs)
 - 2. Sampling process design
 - 3. Sampling methods including handling and transfer of custody
 - 4. Analytical Laboratory Requirements (e.g. certification)
 - 5. Analytical Methodologies
 - 6. Quality Control and Quality Assurance
 - 7. Data Management
 - 8. Data Review, Verification, and Validation
 - 9. Management of Investigation Derived Wastes

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- E. The Subcontractor must document radioactive waste characterization information in adequate detail to accomplish all lifecycle activities. The Subcontractor will perform radioactive waste sampling and analysis (to characterize waste radiological, physical and chemical properties) in accordance with a written sampling and analysis plan that identifies waste characterization data quality objectives.
- F. All waste characterization information (both process knowledge and sampling and analysis results) applicable to a material/waste stream must be readily traceable to the specific waste containers or other (e.g. bulk conveyance load) and immediately available to LBNL when needed.
- G. Subcontractor must have written sampling and survey protocols for characterization and release of waste under the guidance of DOE Order 458.1 and applicable LBNL policies, plans and procedures.

3.3 HAZARDOUS AND RADIOACTIVE WASTE DETERMINATION

- A. The Subcontractor shall be responsible for determining in accordance with hazardous waste regulations and DOE Order, if waste generated by the project is hazardous or radioactive waste. The Subcontractor must maintain documentation demonstrating compliance with this requirement for each waste generated on the project.

3.4 WASTE CERTIFICATION

- A. Subcontractor must have a written and independent waste certification process in place. The process will provide steps necessary for personnel to certify each waste container/bulk waste load generated meets the receiving facility wastes acceptance criteria and applicable DOT requirements.
- B. The Subcontractor radioactive waste organization certification process must define:
 - 1. A method for certifying that the waste meets the planned receiving facility waste acceptance criteria
 - 2. Who is authorized to certify the waste
 - 3. How the waste will be maintained compliant with the certification until shipped (e.g. protected from weather and tampering, labeled, tracked, etc.)
 - 4. How waste certification records are managed.

<NTS: This applies to receiving facilities for radioactive waste other than NNSS. Shipments to NNSS are performed by a Subcontractor with an NNSS-approved Waste Certification Program.>

3.5 WASTE VERIFICATION

- A. Subcontractor must have a written, independent process in place to verify proper Project waste characterization and certification. Defining which materials/wastes to subject to verification and the amount of verification performed should use a documented and graded approach considering risks and consequences of improper waste characterization for each anticipated waste stream.

3.6 EQUIPMENT AND SUPPLIES

- A. Subcontractor must have waste management plans and procedures with sufficient detail and listing required equipment and supplies to manage all generated construction/demolition wastes in accordance with all applicable federal, state, local, and LBNL policies. Deemed as included in the bid amount for the work, the cost of all required waste management equipment and supplies are borne by the subcontractor.
- B. Typical (i.e. not all-inclusive) required equipment and supplies include:
 - 1. Containers

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2. Labels/tags/seals/barcodes/placards
3. Secondary containment
4. Weather protection needs
5. Tools and supplies to properly manage containers (calibrated torque wrenches/vents)
6. Signage
7. Waste transportation/transfer equipment and loading/unloading equipment
8. Emergency response equipment
9. Computerized waste tracking system

3.7 ON-SITE WASTE MANAGEMENT ACTIVITIES

- A. Stop work/emergency prevention (Division 01 Section 013529 "Environment, Safety and Health Procedures)
- B. Waste storage/accumulation (WAA/SAA/regulatory cleanup agreements)
- C. Unknowns and materials pending analysis
- D. Waste packaging and labeling
- E. Waste treatment
- F. On-site waste movement
- G. Waste minimization and avoidance (Division 01 Section 017419 "Construction Waste Management")

3.8 STOP WORK/EMERGENCY PREPAREDNESS AND PREVENTION

- A. Subcontractors must have a written process and implementation procedures that comprehensively address all safety-related work operations/activities and Integrated safety management. Subcontractors must have auditable evidence of the identification and control of hazards in their responsible workplaces documenting potential hazards and the engineering controls needed to mitigate these hazards. All employees must have the right and responsibility to stop work activities posing an imminent danger.
- B. Berkeley Lab's Emergency Management Program maintains an emergency management system designed to minimize the consequences of all emergencies, protect the health and safety of all workers and the public from hazards associated with Berkeley Lab's facilities, and prevent damage to the environment in compliance with DOE Order 151.1C, Comprehensive Emergency Management System.
- C. The implementation of the Emergency Management Program is outlined in Chapter 9 of Berkeley Lab's Environment, Safety & Health (ES&H) Manual (PUB-3000).

3.9 WASTE STORAGE AND ACCUMULATION

- A. Subcontractors will practice good housekeeping on the project site, and clearly mark and segregate wastes from other project materials in designated areas. Subcontractor will control and protect waste and waste containers (prior to, during and after filling) from the weather as necessary to maintain waste and container integrity. Subcontractor will properly label and manage discarded materials and known hazardous and radioactive waste in compliance with applicable waste regulations, DOE Orders, and LBNL policy.
- B. The Subcontractor with the assigned project manager is responsible for identifying, establishing, and managing lay-down and/or waste accumulation areas for staging or accumulating waste and demolition

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debris. The subcontractor waste management organization is responsible for providing specific procedures for the establishment, use, control, inspection and closure of the areas.

- C. Additionally, the Subcontractor is responsible for addressing all established project waste accumulation areas (WAAs) in an emergency response plan in accordance with State/federal emergency response/contingency plans requirements for hazardous waste.
- D. LBNL WMG will review and concur with these procedures prior to use.
- E. Subcontractor will manage generated radioactive waste in the project area in accordance with the Radioactive Waste Management Basis (RWMB) for LBNL, the ES&H Manual (PUB 3000) and in accordance with ALARA principles and the LBNL Radiation Protection Program requirements. California combined wastes are also to be managed in accordance with the requirements of the Memorandum of Agreement (MOA) between the DOE and the State of California DTSC.
- F. The Subcontractor will ship generated radioactive waste offsite within 90 days or plans/procedures define how wastes will be stored in compliance with DOE requirements. The Subcontractor will notify LBNL of any radioactive waste that will exceed the 90-day limit.
- G. Subcontractor will accumulate and store wastes containing PCBs in compliance with applicable Toxic Substances Control Act (TSCA) regulations in addition to California hazardous waste regulations. In some cases, management of PCB waste may be as specified in a risk-based or self-implementing cleanup plan prepared in accordance with 40 CFR 761.
- H. All hazardous and mixed waste must be properly stored within satellite accumulation areas or 90-day accumulation areas in compliance with applicable waste regulations and LBNL policy. Additionally:
 - 1. All PCBs, hazardous and radioactive waste liquids (and those pending analysis) will be stored within secondary containment.
 - 2. Unless otherwise negotiated with the Environmental Protection Agency, Region 9 TSCA Coordinator, accumulation on the project site of PCB waste containing > 50 ppm will be limited to 30 days or less from the container start date.
 - 3. LBNL will be notified, at a minimum, two weeks prior to the LBNL 60 day administrative accumulation limit, if it is anticipated that any hazardous waste in a WAA will exceed the 60 day limit.
 - 4. Under no circumstances can on-site accumulation of hazardous waste exceed one-year total or 90 days in a WAA.
 - 5. Under no circumstances can SAA waste storage exceed the regulatory volume limits specified in California hazardous waste control regulations and Health and Safety Code. The Subcontractor, whenever reaching a SAA volume limit, must label affected container(s) with the date the quantity limit was reached and transfer excess wastes out of the SAA (to WAA/TSDF) within 3 days of that date. Alternately, The Subcontractor may set up a WAA in the waste generating area.
 - 6. The Subcontractor will document weekly inspections of hazardous and mixed waste in WAA to provide auditable compliance with the regulatory inspection requirement. The Subcontractor will provide to LBNL completed inspection checklists upon completion each week. The Subcontractor will note all identified deficiencies found during inspections on the checklists and use subsequent checklists to document deficiency tracking and resolutions.

3.10 UNKNOWN AND MATERIALS PENDING ANALYSIS

- A. All wastes pending analyses will be stored in containers within secondary containment; clearly labeled with a start date of accumulation and stored in accordance with suspected hazards (e.g. hazardous waste, PCB remediation waste, radioactive waste).
 - 1. If a waste is known to be non-hazardous based on documented process knowledge evaluations (PKEs) the statement above is correct and the waste should be labeled "non-hazardous and identified as pending analytical verification" until sample results are known.

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2. Unknown wastes will be, marked as hazardous waste with an accumulation date and identified as potentially containing a hazard and pending analysis". Labeled containers of unknown waste are to be stored in a WAA.

- B. The Subcontractor will manage and dispose of all potentially radioactive project materials and equipment when discarded as a radioactive waste unless characterized and released in accordance with the LBNL RPG requirements and approved Subcontractor procedures.

3.11 SOIL, DEBRIS, AND DEMOLITION RUBBLE WASTE

- A. Waste soils, debris, and demolition rubble that are not classified as hazardous waste (or other regulated waste) and that are radiologically indistinguishable from background are to be disposed of at a California Integrated Waste Management Board Class II waste management unit.
- B. Any soil excavated and removed from the work area is "excavated soil waste" (waste soil) and will be disposed of offsite. Until declared as such by the Subcontractor's waste organization, soils excavated and staged or otherwise handled within the designated work area, are not considered or handled as waste soil. See the Soil Management Plan for more information on management of soils in the work area and determination of when excavated soil becomes a waste soil subject to this waste management specification and the Project WMP.
- C. For more information, see Soil Management Plan for Lawrence Berkeley National Laboratory.

3.12 PACKAGING AND LABELING

- A. The Subcontractor will package all demolition materials and waste in compliance with applicable regulations and receiving facility acceptance criteria. The Subcontractor waste organization is responsible for providing suitable packages, packaging the materials and loading the packages on trucks for shipment to the appropriate facility. The WMG will provide oversight to evaluate subcontractor compliance with DOT and WAC.
- B. The Subcontractor will select shipping containers based on the assigned Department of Transportation hazardous material proper shipping name. These containers must undergo a documented receipt inspection and acceptance in accordance with a written quality assurance plan, filled, closed and prepared for shipment in accordance with applicable DOT requirements.
- C. Procedures must provide specific instructions for packaging of LLW for shipment to reuse, recycling, treatment, storage and disposal facilities, such as:
 1. proper package selection
 2. receiving, inspecting and using DOT containers
 3. packaging specific waste to meet the WAC
 4. compliance with regulations in 49 CFR 171–180, NUREG-1608, and RCRA and California hazardous waste regulations
 5. size reduction of bulky items
 6. identifying hold points for LBNL oversight
 7. identifying labeling and marking requirements for waste containers

3.13 WASTE TREATMENT

- A. The Subcontractor waste organization must describe the characteristics and quantities of anticipated liquid wastes, define the intended management methods to capture the liquid, and specify methods to prevent release to the environment, such as one of the following:

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1. Direct disposal into the LBNL sanitary treatment system under the conditions in the East Bay Municipal Utility District permit
 2. Transfer of the liquid waste to a permitted pretreatment processes on site if validated characterization and volume data ensure the waste meets the applicable LBNL permit requirements
 3. Treatment that does not require a RCRA Part B Permit
 4. Transfer of the waste to a TSDF
- B. In all cases, the proposed management of liquid waste by the Subcontractor will performed the activities using approved written procedures. LBNL EHS will approve the procedures prior to implementation and provide oversight during operations. The subcontractor will address each generated liquid LLW on an individual basis.
- C. There are no other approvals for any other treatments of generated waste by the Subcontractor.

3.14 ONSITE WASTE MOVEMENT

- A. Subcontractor plans and procedures need to address onsite movement of DOT regulated waste that is not part of an offsite waste shipment. Plans and procedures need to assure as necessary, DOT equivalency as required by DOE Order 460.1D and the LBNL Department of Transportation Safety Document (TSD).
- B. In addition, plans will specify that hazardous waste generators must comply with the following for all containers of hazardous waste:
1. Applying the accumulation start dates for waste in the container and assuring it is clearly marked and visible for inspection on each container
 2. Labeling each container clearly with the words, "Hazardous Waste" and the following information:
 - a. composition and physical state of the wastes;
 - b. Statement or statements which call attention to the particular hazardous properties of the waste (e.g., flammable, reactive, etc.);
 - c. Name and address of the person producing the waste. (LBNL interprets this last requirement as meaning an actual person's name (vs. an organization) and an onsite building address until the wastes are labeled for off-site shipment)

3.15 WASTE MINIMIZATION AND AVOIDANCE (RECYCLING AND REUSE)

- A. LBNL Project Manual Specification Section 017419, Construction Waste Management, requires a minimum diversion of 75% of the total project non-radiological/nonhazardous waste.
- B. The Subcontractor is responsible for estimating the types and quantities of waste materials as well as the amounts to be reused, recycled or landfilled. Section 017419 defines documentation and reporting requirements for landfilled and diverted waste, information on waste reuse and recycling services in the area and categories of waste materials that are candidates for landfill diversion.
- C. If a material that is proposed for recycling or reuse could potentially be a regulated material, the following information must be submitted for review at least two weeks prior to planned removal from the site:
1. Full description of the material;
 2. Description of how the material will be recycled or reused;
 3. Name, address, phone number of the company providing the recycling service; and
 4. Method of transport, including name, address, and phone number of company transporting the material. The proposed recycling or reuse must be approved by LBNL prior to removal of the material from the site.

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3.16 OFFSITE WASTE MANAGEMENT

- A. Subcontractor waste management planning needs to include as necessary, evaluations to identify the most cost effective treatment and/or disposition options that are legally defensible, protective of human health and the environment and that minimizes future LBNL liabilities.
- B. The Subcontractor, on behalf of Berkeley Lab (the generator), are responsible to characterize, classify, schedule, manifest, package, and transport waste shipments to the appropriate receiving facilities in accordance with the WACs, licenses, permits, and applicable state and federal regulations.
- C. Subcontractor plans and procedures need to address off-site waste management requirements including but not limited to the following:
 - 1. Applicable requirements
 - 2. Applicable treatments
 - 3. Certifications
 - 4. Permits/licenses
 - 5. WAC requirements
 - 6. Disposition
 - 7. Certificates of disposal/destruction
- D. Subcontractors should identify potential waste disposal facilities early based on process knowledge and design sampling and analysis activities to obtain the appropriate data to prepare waste profiles and meet waste acceptance criteria (WAC). Subcontractor plans and procedures must include a process for LBNL review and concurrence with proposed waste receiving facilities prior to use.
- E. The memorandum of agreement (MOA) between DOE and the State of California for combined waste only allows shipment of combined waste as LLW to a facility outside the state of California. If the receiving facility is in a state that specifies waste that is hazardous in the state of origin is hazardous in that state (e.g. Nevada), the MOA does not apply and the Subcontractor will profile and ship the waste as mixed waste.
- F. When there is a potential for shipping special nuclear materials, the subcontractor is expected to coordinate with the LBNL Radiation Protection Group (RPG) and Waste Management Group (WMG) prior to sending information to the disposal facility. RPG will provide guidance for calculating accountability thresholds.
- G. When received, the Subcontractor will provide to LBNL, the authorization for receipt of LBNL LLW by an off-site receiving facility (in accordance with their WAC). LBNL maintains these as waste management records.

3.17 TRANSPORTATION

- A. The subcontractor waste organization must establish and document the process for transporting waste from the demolition work site to the appropriate waste receiving facilities in accordance with their WAC/DOT/NRC/DOE requirements. The process will include, but not limited to the following tasks:
 - 1. Provide the basic approaches to transportation management of each waste category/type.
 - 2. Integrate the number and frequency of shipments with the overall project schedule.
 - 3. Establish guidelines and delineate responsibility for shipment scheduling.
 - 4. Identify and describe how and where shipping records are retained and for how long; identify who is responsible for records retention.
 - 5. Delineate responsibilities for required interfaces and notifications with LBNL organizations/personnel and with receiving facilities.
 - 6. Provide instructions for completing shipping papers and forms for each approved receiving facility.
 - 7. Address transportation security requirements.
 - 8. Provide instructions for shipment preparations and loading materials/packages onto transport vehicles, such as the following:
 - a. Specifying banding, palletizing, blocking, and bracing methods to ensure load stability.
 - b. Identifying hold points for LBNL WMG inspection.

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- c. Utilizing safety/security inspection checklists for trucks arriving at and departing the project site.
 - d. Verifying compliance of transporter with applicable requirements.
 - e. Conducting inspections of transport vehicles, loads, and reusable shipping packages.
 - f. Specifying how radiological surveys will also be performed on radioactive materials transport vehicles and packages when they arrive at or leave Berkeley Lab.
- B. The subcontractor waste organization must establish a plan or procedure to address characterization and waste acceptance criteria compliance for soil or other wastes that are to be excavated and directly loaded onto conveyances for off-site landfill disposal (i.e. as non-hazardous and non-radioactive waste). The data representative of the wastes must show with a high degree of confidence the wastes are not radiological contaminated and do not exceed allowable chemical contamination limits for the planned disposal.
- C. Subcontractor plans and procedures must include a process for LBNL review and concurrence with proposed waste transporters prior to use. Waste transporters must be licensed/certified as a hazardous waste hauler if utilized for transportation of radioactive, hazardous or mixed wastes. As applicable, waste transporters used for PCB wastes must show evidence that, they have notified the EPA of their PCB transportation activities.

3.18 SHIPPING DOCUMENTS

- A. The Subcontractor waste organization must establish and document the process for the steps involved in preparing shipping documents for disposition of waste to an off-site waste handling or disposal facility. The following is a general overview of the steps involved:
 - 1. Completion and submittal of the waste profile and other applicable information (analytical data, process knowledge evaluations).
 - 2. Finalize subcontract arrangements for treatment and/or disposal services.
 - 3. Receive waste profile approval.
 - 4. Receive approval from the facility of shipping documents/shipment.
 - 5. Prepare shipping Manifests (UHWM, 540/541). Shipments of LLW to commercial disposal sites require the completion of a Uniform Low-Level Radioactive Waste Manifest (Forms 540 and 541). Shipments of non-Hazardous waste require non-hazardous manifests or Bill of Ladings (BOLs, LDR notifications)
 - 6. Ship the waste to the facility.
 - 7. Obtain a Certificate of Disposal for permanent retention.
- B. For radioactive waste, approval for use of a non-DOE waste treatment, storage or disposal facility will require the Subcontractor to obtain an exemption in accordance with DOE M 435.1 Radioactive Waste Manual, Chapter I, Section (2)(F)(4) and Berkeley Site Office (BSO) requirements
- C. The Subcontractor will manifest hazardous and mixed waste to appropriate TSDFs using the LBNL EPA identification number. Prepared uniform hazardous waste manifests (UHWMs) will include the Generator's Name and Mailing Address, similar to the following:

Lawrence Berkeley National Laboratory (LBNL)
One Cyclotron Rd, MS-85-R0203
Berkeley, CA 94720
Attention: Waste Generator

PROJECT NAME

3.19 OFFSITE VENDOR WASTE PROFILES

- A. The Subcontractor must prepare suitable profiles/manifests for all project waste. The waste profiles provide WAC-required information such as the following:
 - 1. Generator and waste stream information
 - 2. Physical properties and packaging
 - 3. Radiological information:
 - a. Maximum dose rate
 - b. Contamination limits
 - c. Concentration limits
 - 4. Chemical composition and hazard evaluation
- B. The Subcontractor will prepared offsite vendor waste profiles primarily based on documented process knowledge augmented with radiation survey information and analytical sample results as needed
- C. All vendor profiles (and supporting documentation) prepared for waste to be shipped offsite, are to be reviewed by LBNL prior to submittal of the profiles to the vendor. Copies of receiving facility approved profiles will be provided to or be readily available upon request by LBNL.

3.20 WASTE MANAGEMENT RELATED DOCUMENTS, WASTE TRACKING AND RECORDKEEPING

- A. The Subcontractor must develop a Records Management Plan that is approved by LBNL. Among other requirements, the Records Management Plan must identify the records that must be retained; describe how and where they must be retained; specify the retention period; and identify who is to be responsible for records retention. The Records Management Plan must integrate into the Subcontractor's records management process the requirements of the LBNL Archives and Records Management Policy and include applicable requirements such as those found in the LBNL EHS Records Management Plan for the Environmental Service Group, Environmental Radiological Protection and Environmental Restoration Programs.
- B. The subcontractor waste organization must establish and document the process that clearly identifies expectations for revisions and updates of all generated waste management related documents including providing input/corrections/comments, approval/concurrence and resolution of issues.
- C. Subcontractor planning and communication with the LBNL personnel relating to waste profiling and shipping schedules must accommodate review times necessary for the LBNL to review and approve/concur with identified waste transporters and receiving facilities, especially in those cases where the transporter or receiving facility has not been previously utilized at LBNL.
- D. Container or conveyance specific waste tracking for all wastes onsite and shipped needs maintained up-to-date and readily available to LBNL at all times. Tracking should include information on waste stream and characterization data, point of generation, container ID, waste accumulation start date, container location, date and volume of package, date shipped (and received) offsite, receiving facility and shipment identifiers, disposal notification plus any other information required by regulation.
- E. The Subcontractor's waste organization are responsible for ensuring that documents (including plans, procedures, work instructions, drawings, surveys, calculations, and specifications) will be controlled to provide users with the most current version used to perform work. Work processes that ensure compliance with requirements will be documented in approved controlled electronic documents.
- F. Documents will be prepared, reviewed, issued, and revised according to established processes.
- G. Hard paper copies of the subcontractor's shipping documents must be provided, within specified periodicity, to the LBNL Waste Management Group. Required shipping document records must include but are not limited to the following:

PROJECT NAME

1. Manifest
2. Profiles
3. Applicable Analytical Reports
4. Land Disposal Restriction Forms
5. Shipment Checklists
6. Certificates of Disposal

3.21 MISCELLANEOUS

A. Waste Accumulation Time Extensions

1. The California Department of Toxic Substances Control (DTSC) grants extensions to allowed waste accumulation time under limited conditions. In most cases, DTSC will not grant an extension unless the generator has requested before the accumulation period expires. DTSC handles applications for storage extensions of RCRA regulated waste and combined waste (based on DTSC/DOE Combined Waste MOA requirements). The CUPAs can grant non-RCRA waste storage extensions. (Cal. Code Regulations, title 22, § 66262.35).
2. The DTSC may grant an extension, of up to 30 days, to a generator who cannot meet the 90-day on-site hazardous waste storage limit requirement. Pursuant to California Code of Regulations, title 22, section 66262.34 (c), "An extension may be granted by the Department if hazardous waste must remain on-site for longer than 90 days due to unforeseen, temporary, and uncontrollable circumstances. An extension of up to 30 days may be granted at the discretion of the Department on a case-by-case basis". DTSC grants extension for Resource Conservation Recovery Act (RCRA) and combined waste only. For applications go to <http://www.dtsc.ca.gov/HazardousWaste/upload/Storage-Extension-Application-for-Generators.pdf>

B. Waste Transfers to the LBNL Hazardous Waste Handling Facility (HWHF)

1. Subcontractor waste management organizations will ship all generated wastes directly from the demolition site or the accumulation or storage areas to the appropriate receiving facilities.
2. LBNL, under limited conditions, may agree to accept incidental quantities of project waste via transfer to the onsite Hazardous Waste Handling Facility (HWHF). Any transfers of waste will be addressed on an individual basis. In all cases, the proposed transfer of waste must be performed under subcontractor written procedures and meet the on-site HWHF WAC. LBNL EHS will make determination to approve such proposals based on the overall cost and efficiency of management alternatives.

C. Exemption Packages

1. For radioactive waste, approval for use of a non-DOE waste treatment, storage or disposal facility will require the Subcontractor waste organization to obtain an exemption in accordance with DOE M 435.1 Radioactive Waste Manual, Chapter I, Section (2)(F)(4) and Berkeley Site Office (BSO) requirements.

D. PCB Cleanup Plans/requests to EPA for PCB storage/packaging/disposal deviations

1. Potential sources of hazardous materials/waste at LBNL include processes related to the science programs, the materials of building construction, the constituents of the building's systems and related operations. In construction/demolition projects, there is always a possibility of discovering additional sources of hazardous contamination and radioactive material. In accordance applicable federal, state, local, and LBNL policies LBNL is obligated to report any potential risks to the environment and the safety and health of the public. The Subcontractor plans and procedures must address steps to take when hazardous contaminants are present above environmental screening and/or back ground levels. This will include the Subcontractor immediately notifying LBNL EHS. LBNL will address each such event on an individual basis and the Subcontractor may be required to develop and implement a risk-based or voluntary cleanup plans.

E. Regulatory Violations/Off-site Transportation /TSDF incidents/TSDF Rejections/Permit Violations

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1. The Subcontractor waste organization plans and procedures must address steps to be taken when there is a failure to meet external or internal requirements, laws, regulations, or compliance documents or specifications. Steps may include immediate correction of the deficiency or implementation of corrective actions. The Subcontractor will address deficiencies and their corrections according to established requirements. The Subcontractor will analyze failures to identify potential systemic weaknesses in management. The Subcontractor will notify LBNL EHS immediately when any major waste management deficiencies occurs. Subcontractors must comply with the requirements for issues management as prescribed in LBNL/PUB-5519(4), Lessons Learned and Best Practices Program Manual.

END OF SECTION 013529.23

NTS: Add a change log to the end of each section. This is for internal use only and the A/E will delete this from the project set of specifications.

Date	Reviewer	Paragraph	Summary of update
2/16/24	RS	ALL	New

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Appendix A

1. Sampling and Analysis Plan (over 100 CY or in situ sampling)
2. Classification as PCB remediation waste depends on the concentration at the source of PCBs, the date of release, the current PCB concentration in the materials, and whether the original source was authorized for use.
3. For disposal at licensed disposal facilities radiological analysis will be required to determine if IFB
4. De minimus volumes of soil designated for reuse at other LBNL locations or for disposal will require sampling

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Type	Definition	Sampling Required ¹	Management Strategy	Treatment/Disposal	Shipping documentation required
Low Level Radioactive Waste	Soil/construction /demolition wastes containing radioactivity that is distinguishable from natural background levels (>IFB)	Yes	Store/label/package in accordance with appropriate regulations/plans; ship to a licensed Nuclear Regulatory Commission (NRC) or a DOE radioactive waste disposal facility	NNSS/Energy Solutions/WCS	Approved Profile/540-541 NRC Rad Manifest (DOE Order 435.1 exemption packages for Non-DOE TSDF)
Mixed low-level waste	Soil/construction/demolition wastes containing radioactivity that is distinguishable from natural background levels (>IFB) and identified as a federal Resource Conservation and Recovery Act (RCRA) hazardous waste.	Yes	Store/Label/Package in accordance with appropriate regulations/plans; ship to a permitted Treatment, Storage and Disposal (TSD) facility licensed to handle radioactive waste	Energy Solutions/Permafrix/WCS and disposal at Energy Solutions/WCS/NNSS Treatment and disposal at Energy Solutions	Approved Profile/Uniform Hazardous Waste Manifest/Land Disposal Restriction (LDR) Form/540-541 NRC Rad Manifest, (DOE Order 435.1 exemption packages for Non-DOE TSDF)
Hazardous waste	Soil/construction/demolition wastes with chemical contaminants above State of California (>CA) or federal (>RCRA) waste standards, TSCA standards (>50 ppm PCB) and that is radiologically IFB. (e.g., Mercury/PCB contaminated soil.)	Yes	Store/label/package in accordance with appropriate regulations; ship to a permitted TSD facility.	CA Class I and/or RCRA permitted/TSCA compliant landfill Chemical Waste Management (Kettleman Hills and Arlington Facilities)	Approved Profile/Uniform Hazardous Waste Manifest/LDR Form
RCRA waste	Soil/construction/demolition waste that meets the federal criteria for a hazardous waste.	Yes	Store/label/package in accordance with appropriate regulations; ship to permitted TSD facility	Class I and/or RCRA permitted landfill Chemical Waste Management (Kettleman Hills and Arlington Facilities)	Approved Profile/Uniform Hazardous Waste Manifest/LDR Form
CA regulated hazardous waste	Soil/construction/demolition wastes that does not meet the federal criteria (<RCRA) for a hazardous waste, but which meets California specific state regulatory criteria (>CA) for a hazardous waste.	Yes	Store/label/package in accordance with appropriate regulations and ship to compliant permitted TSD facility	CA Class I, II landfills Chemical Waste Management (Kettleman Hills and Arlington Facilities); Class II	Approved Profile/Uniform Hazardous Waste Manifest and/or LDR Form

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				(Altamont, and Potrero Hills)	
Combined Waste	Soil/construction/demolition waste containing contaminants at concentrations above State of California hazardous waste levels (>CA) but below federal hazardous waste levels (RCRA) combined with radionuclides above background levels.	Yes	Store/label/package in accordance with appropriate regulations/plans and ship to a licensed NRC or a DOE radioactive waste disposal facility that is permitted or approved to accept the CA hazardous waste. Note: Radioactive waste management activities must comply with the Memorandum of Agreement between the California Department of Toxic Substances Control and United States Department of Energy Governing the Regulation of Combined Waste at the Department of Energy Facilities in California ("DTSC/DOE Combined Waste MOA").	a) DOE – NNSS – shipped as mixed waste b) NRC- Energy Solutions/WCS	a) Approved Profile/Uniform Hazardous Waste Manifest/LDR Form/540-541 NRC Rad Manifest b) Approved Profile/540-541 NRC Rad Manifest, DOE Order 435.1 exemption packages.
Non-Hazardous	Soil/construction /demolition wastes containing metals at concentrations above the upper estimate of LBNL background and below State of California (<CA) or federal hazardous waste (<RCRA) levels and/or containing detectable concentrations of organic contaminants below State of California or federal hazardous waste levels, and that is radiologically IFB.	Yes	Store/label/package in accordance with appropriate regulations/plans; Ship to a licensed landfill	CA Class II Landfill. Class II (Altamont, and Potrero Hills)	Approved Profiles/Non-Hazardous Waste Manifest or Bill of Lading (BOL)

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PCB Remediation ² Waste	Soil/construction/demolition wastes containing PCBs (>50 ppm) from a spill, release, or other unauthorized disposal and that is radiologically IFB.	Yes	Store/label/package in accordance with appropriate regulations/plans; Ship to a licensed TSD facility	CA Class I and/or TSCA compliant landfill, TSCA Chemical Waste Management (Kettleman Hills and Arlington Facilities);	Approved Profile/Uniform Hazardous Waste Manifest
Designated Waste	Non-hazardous soil/construction/demolition waste that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or could reasonably be expected to affect beneficial uses of the waters of the state.	Yes	Store/label/package in accordance with appropriate regulations/plans; ship to a licensed landfill	CA Class II landfill Class II (Altamont, and Potrero Hills)	Approved Profile/BOL or Non-Hazardous Waste Manifest
Industrial Soil ³	Soil with chemical concentrations below regulatory screening levels for industrial workers, construction workers, and the groundwater leaching pathway that is not radiologically contaminated above DCGLs.	Yes	Replace in the same general excavation area (e.g., the same utility trench or the same building foundation excavation) from which it was removed or store/package in accordance with appropriate regulations/plans and ship to a licensed landfill.	CA Class II landfill Class II (Altamont, and Potrero Hills)	Approved Profile/BOL or Non-Hazardous Waste Manifest
Residential Soil	Soil with chemical concentrations below regulatory screening levels for residents, construction workers, and leaching to groundwater that is not radiologically contaminated	Yes	Reused within the developed areas of Berkeley Lab at a location other than that from which it was excavated or store/package in accordance with appropriate regulations/plans and ship to licensed landfill.	CA Class II landfill. Class II (Altamont, and Potrero Hills)	Approved Profile/BOL or Non-Hazardous Waste Manifest
Clean Soil	Clean soil/construction/demolition wastes that do not contain radionuclides or metals above LBNL background levels or any other chemical contaminants	Yes	Reuse at LBNL at any location or store/package in accordance with appropriate regulations and ship to licensed recycler or landfill.	CA Class II, III landfill .Class II (Altamont, and Potrero Hills)	Approved Profile/BOL or Non-Hazardous Waste Manifest

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De Minimus ⁴	Soil from excavation project in which the in situ soil excavation volume is 10 cubic yards (CY) or less in areas where there is no evidence of contamination based on historical site information and visual and olfactory indications during excavation.	No	Reuse in the original excavation area. Sampling is not required for de minimus excavation projects unless there is evidence of contamination or store/label/package in accordance with appropriate regulations/plans and ship to a licensed landfill.	CA Class II landfill. Class II (Altamont, and Potrero Hills)	Approved Profile/BOL or Non-Hazardous Waste Manifest