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DOE-STD-1157-2002  
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# DOE STANDARD

## ENVIRONMENTAL RESTORATION FUNCTIONAL AREA QUALIFICATION STANDARD

DOE Defense Nuclear Facilities Technical Personnel



**U.S. Department of Energy**  
**Washington, D.C. 20585**

**AREA TRNG**

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**APPROVAL**

The Federal Technical Capability Panel consists of senior Department of Energy managers responsible for overseeing the Federal Technical Capability Program. This Panel is responsible for reviewing and approving the Qualification Standard for Department-wide application. Approval of this Qualification Standard by the Federal Technical Capability Panel is indicated by signature below.

  
Roy J. Schepens  
Chairman  
Federal Technical Capability Panel

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### ACKNOWLEDGMENT

The Office of Environmental Management is the Sponsor for the Environmental Restoration Qualification Standard. The Sponsor is responsible for coordinating the development and/or review of the Functional Area Qualification Standard by subject matter experts to ensure that the technical content of the standard is accurate and adequate for Department-wide application for those involved in the Environmental Restoration Program. The Sponsor, in coordination with the Federal Technical Capability Panel, is also responsible for ensuring that the Functional Area Qualification Standard is maintained current.

The following subject matter experts (SMEs) participated in the development and/or review of this Qualification Standard:

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**U.S. DEPARTMENT OF ENERGY  
FUNCTIONAL AREA QUALIFICATION STANDARD**

**FUNCTIONAL AREA**

**Environmental Restoration**

**PURPOSE**

The Department's Federal Technical Capability Program Policy, issued by the Secretary in December 1998, commits the Department to continuously strive for technical excellence. The Technical Qualification Program, along with the supporting Technical Qualification Standards, complements the personnel processes that support the Department's drive for technical excellence. In support of this goal, the competency requirements defined in the Technical Qualification Standards should be aligned with and integrated into the recruitment and staffing processes for technical positions. The Technical Qualification Standards should form the primary basis for developing vacancy announcements, qualification requirements, crediting plans, interviewing questions, and other criteria associated with the recruitment, selection, and internal placement of technical personnel. Office of Personnel Management minimum qualifications standards will be greatly enhanced by application of appropriate materials from the technical Functional Area Qualification Standards.

The Technical Qualification Standards are not intended to replace the OPM Qualifications Standards nor other Departmental personnel standards, rules, plans, or processes. The primary purpose of the Technical Qualification Program is to ensure that employees have the requisite technical competency to support the mission of the Department. The Technical Qualification Program forms the basis for the development and assignment of DOE personnel responsible for ensuring the safe operation of defense nuclear facilities.

**APPLICABILITY**

The Environmental Restoration Functional Area Qualification Standard establishes common functional area competency requirements for Department of Energy personnel who provide assistance, direction, guidance, oversight, or evaluation of contractor technical activities impacting the safe operation of DOE's most hazardous facilities. The technical Functional Area Qualification Standard has been developed as a tool to assist DOE Program and Field offices in the development and implementation of the Technical Qualification Program in their organization. Program and Field offices are expected to use this technical Functional Area Qualification Standard as-is, and they may add to it with their own unique site or facility specific Technical Qualification Standards. In either case, satisfactory and documented attainment of the competency requirements contained in this technical Functional Area Qualification Standard ensures that personnel possess the requisite competence to fulfill their functional area duties and responsibilities. Office/Facility-Specific Qualification Standards supplement this technical Functional Area Qualification Standard and establish unique operational competency requirements at the Headquarters or Field element, site, or facility level.

## IMPLEMENTATION

This technical Functional Area Qualification Standard identifies the technical competency requirements for Department of Energy personnel. Although there are other competency requirements associated with the positions held by DOE personnel, this Functional Area Qualification Standard is limited to identifying the specific technical competencies. The competency statements define the expected knowledge and/or skill that an individual must meet. Each of the competency statements is further explained by a listing of supporting knowledge and/or skill statements.

The competencies identify a familiarity level, a working level, or an expert level of knowledge; or they require the individual to demonstrate the ability to perform a task or activity. These levels are defined as follows:

**Familiarity level** is defined as basic knowledge of or exposure to the subject or process adequate to discuss the subject or process with individuals of greater knowledge.

**Working level** is defined as the knowledge required to monitor and assess operations/activities, to apply standards of acceptable performance, and to reference appropriate materials and/or expert advice as required to ensure the safety of Departmental activities.

**Expert level** is defined as a comprehensive, intensive knowledge of the subject or process sufficient to provide advice in the absence of procedural guidance.

**Demonstrate the ability** is defined as the actual performance of a task or activity in accordance with policy, procedures, guidelines, and/or accepted industry or Department practices.

Headquarters and Field elements shall establish a program and process to ensure that DOE personnel possess the competencies required of their position. That includes the competencies identified in this technical Functional Area Qualification Standard or a similar Standard developed by the organization. Documentation of the completion of the requirements of the Standard shall be included in the employee's training and qualification record.

Equivalencies may be granted for individual competencies based upon an objective evaluation of the employee's prior education, experience, and/or training. Equivalencies shall be granted in accordance with the policies and procedures of the program or field office. The supporting knowledge and/or skill statements, while not requirements, should be considered before granting equivalency for a competency.

Training shall be provided to employees in the Technical Qualification Program who do not meet the competencies contained in the technical Functional Area Qualification Standard. Departmental training will be based upon appropriate supporting knowledge and/or skill statements similar to the ones listed for each of the competency statements. Headquarters and Field elements should use the supporting knowledge and/or skill statements as a basis for evaluating the content of any training courses used to provide individuals with the requisite knowledge and/or skill required to meet the technical Functional Area Qualification Standard competency statements.

## EVALUATION REQUIREMENTS

Attainment of the competencies listed in this technical Functional Area Qualification Standard should be documented by a qualifying official, immediate supervisor, or the team leader of personnel using any of the following methods:

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- Documented evaluation of equivalencies
- Written examination
- Documented oral evaluation
- Documented observation of performance

### CONTINUING EDUCATION, TRAINING AND PROFICIENCY

DOE personnel shall participate in continuing education and training as necessary to improve their performance and proficiency and ensure that they stay up-to-date on changing technology and new requirements. This may include courses and/or training provided by:

- Department of Energy
- Other government agencies
- Outside vendors
- Educational institutions

A description of suggested learning proficiency activities, and the requirements for the continuing education and training program for Environmental Restoration personnel are included in Appendix A of this document.

### DUTIES AND RESPONSIBILITIES

The following are the typical duties and responsibilities expected of personnel assigned to the Environmental Restoration Functional Area:

- A. Maintain communication with Headquarters, field elements, regulatory agencies, the public and other stakeholders.
- B. Inform Department of Energy management of applicable environmental restoration project status, activities, and issues.
- C. Plan, observe, and evaluate environmental restoration activities and contractor performance to ensure the adequacy and effectiveness of contractor programs such as:
  - Technical performance
  - Plans, policies, and procedures
  - Management controls
  - Worker training and qualification programs
  - Occurrence Reporting and corrective actions
  - Worker and public health and safety programs
  - Environmental protection and regulatory compliance
  - Waste TSD and transportation programs
- D. Develop, review, and assess environmental restoration documentation.
- E. Develop, manage, and assist in the negotiations for regulatory agreements and permits.
- F. Resolve or facilitate the resolution of environmental restoration issues.

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- G. Develop, implement, and evaluate environmental restoration strategic, baseline, project, and program plans.
- H. Promote the sharing of information and technology.
- I. Conduct site-specific technology implementation evaluations.
- J. Evaluate the adequacy and effectiveness of Federal and contractor environmental restoration programs to ensure program compliance with, Department Orders, standards guides; Federal regulations, statutes, codes; and applicable state and/or local regulations.

Position-specific duties and responsibilities for environmental restoration personnel are contained in their Office/Facility-Specific Qualification Standard or Position Description.

### BACKGROUND AND EXPERIENCE

The U. S. Office of Personnel Management's Qualification Standards Handbook establishes minimum education, training, experience, or other relevant requirements applicable to a particular occupational series/grade level, as well as alternatives to meeting specified requirements.

The preferred education and experience for environmental restoration personnel is:

#### 1. Education:

Bachelor of Science degree in engineering/science or a related discipline; or meeting the alternative requirements specified for engineers or scientists in the Qualifications Standards Handbook.

#### 2. Experience:

Industrial, military, Federal, State or other directly related background that has provided specialized experience in environmental restoration. Specialized experience can be demonstrated through possession of the competencies outlined in this Standard.

### REQUIRED TECHNICAL COMPETENCIES

The competencies contained in this Standard are distinct from those competencies contained in the General Technical Base Qualification Standard. All Environmental Restoration personnel must satisfy the competency requirements of the General Technical Base Qualification Standard prior to or in parallel with the competency requirements contained in this Standard. Each of the competency statements defines the level of expected knowledge and or skill that an individual must possess to meet the intent of this Standard. The supporting knowledge and/or skill statements further describe the intent of the competency statements.

**Note:** When regulations or Department of Energy directives or other industry standards are referenced in the Qualification Standard, the most recent revision should be used.

**SCIENTIFIC AND ENGINEERING PRINCIPLES**

*Chemistry*

- 1. Environmental restoration personnel shall demonstrate a familiarity level knowledge of chemistry fundamentals.**

Supporting Knowledge and/or Skills

- a. Discuss the following types of chemical bonds:
  - Ionic
  - Covalent
  - Metallic
- b. Discuss how elements combine to form chemical compounds.
- c. Define and discuss the following terms:
  - Mixture
  - Solvent
  - Solubility
  - Solute
  - Solution
  - Equilibrium
  - Density
  - Molarity
  - Parts per million (ppm)
  - Acid
  - Base
  - pOH
  - Salt
  - pH

- 2. Environmental restoration personnel shall demonstrate a familiarity level knowledge of chemistry fundamentals in the areas of corrosion and water treatment.**

Supporting Knowledge and/or Skills

- a. Explain the process of general corrosion of iron and steel when exposed to water.
- b. Discuss the two conditions that can cause galvanic corrosion.
- c. Discuss the following types of specialized corrosion:
  - Pitting corrosion
  - Stress corrosion cracking
  - Crevice corrosion

- d. Explain the following water treatment processes.
- Ion exchange
  - pH adjustment
  - Clarification
  - Solids handling

*Statistics*

**3. Environmental restoration personnel shall demonstrate a familiarity level knowledge of solving problems involving probability and simple statistics.**

Supporting Knowledge and/or Skills

- a. State the definition of the following statistical terms:
- Mean
  - Variance
  - Standard deviation of the mean
  - Median
  - Mode
  - Standard deviation
- b. Explain the structure and function of distributions.
- c. Calculate the mathematical mean of a given set of data.
- d. Calculate the mathematical standard deviation of the mean of a given set of data.
- e. Given the data, calculate the probability of an event.
- f. Describe how measures of samples (i.e., measures of central tendency and variability) are used to estimate population parameters through statistical inference.
- g. Discuss Type I and Type II decision errors and the relationship to sampling and confidence levels.

*Hydrology, Geology, and Soil Science*

**4. Environmental restoration personnel shall demonstrate a familiarity level knowledge of the basic principles and concepts of hydrology, geology, and soil science.**

Supporting Knowledge and/or Skills

- a. List the different soil textures (compositions) and soil structures.
- b. Define humus and explain its role in chemical reactions in the soil.
- c. Define erosion and describe the characteristics and effects of water and wind erosion.

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- d. Describe the following processes and explain how water and soil interact in each:
- Infiltration and percolation
  - Groundwater recharge
  - Runoff
  - Evapotranspiration
- e. Describe how soil characteristics, slope factors, and land cover conditions impact contaminant detachment and transport processes.
- f. Discuss contaminant loading and the contaminant delivery ratio.
- g. Discuss the use of soil survey maps.
- h. Discuss the cation and anion exchange capacity of soils.
- i. Describe the hydrologic cycle.
- j. Define the following hydrologic terms and describe the relationships between them:
- Precipitation
  - Stream flow
  - Evaporation
  - Transpiration
  - Subsurface water
  - Sedimentation
- k. Define the following groundwater terms and describe the relationships between them:
- Capillary water
  - Zone of saturation
  - Specific yield
  - Hydraulic conductivity
  - Transmissivity
  - Vadose zone
- l. Define the following surface water terms:
- Mass curve
  - Frequency analysis
- m. Discuss the composition and identification of the following types of rocks and cite examples of each.
- Igneous
  - Sedimentary
  - Metamorphic
- n. Describe the geometry and properties of the following rock mass features:

- Folds
  - Faults
  - Structural Discontinuities
  - Residual Stress
  - Sheet Joints
  - Structural discontinuities
  - Shear strength of discontinuities
  - Residual stress
  - Sheet joints
- o. Discuss the use of geological and geotechnical maps.
- p. Describe the geologic considerations, criteria and procedures used to assess natural hazards and potential environmental problems related to the following topographic features and conditions:
- Areas of high or low relief
  - Potentially unstable slopes
  - Flood plain
  - Karst terrain
  - Proximity to fault zones
  - Volcanic terrain
  - Glaciated terrain
- q. Discuss weathering and its significance in geotechnical engineering.
- r. Describe and discuss tests that assess weatherability.
- s. Describe and discuss the process for logging rock cores.
- t. Discuss how contaminant movement relates to soil density.

***Graphical Data and Measurements***

**5. Environmental restoration personnel shall demonstrate a familiarity level knowledge of reading and plotting graphs and interpreting graphical data.**

Supporting Knowledge and/or Skills

- a. Solve for the unknown given a linear equation with multiple units, such as Environmental Protection Agency risk equations.
- b. Given a graph, interpret meaning of slope and intercept, such as slope factor for a carcinogenic chemical.
- c. Interpret data on a simple graph, such as time/concentration.
- d. Given a table of data, plot the data points on a Cartesian coordinate graph.

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- e. Given a table of data, plot the data points on a logarithmic coordinate graph.
- f. Given a graph, determine the slope of a line.

### **6. Environmental restoration personnel shall demonstrate a working level knowledge of the units of measurement and conversion between English and SI systems.**

#### Supporting Knowledge and/or Skills

- a. Define the three fundamental dimensions: length, mass and time.
- b. List standard units of the fundamental dimensions for each of the following systems.
  - International System of Units (SI)
  - English System
- c. Differentiate between fundamental and derived measurements.

### ***Environmental Biology***

### **7. Environmental restoration personnel should demonstrate a familiarity level knowledge of the basic terms and concepts of environmental biology.**

#### Supporting Knowledge and/or Skills

- a. Define the following terms:
  - Ecosystem
  - Habitat
  - Species
  - Pathways analysis
  - Bioaccumulation
  - Bioconcentration
  - Biototoxicity
  - Biodiversity
- b. Discuss how synergism makes it difficult to establish a cause and effect relationship between pollutants and disease.

### ***Meteorology***

### **8. Environmental restoration personnel shall demonstrate a familiarity level knowledge of the basic principles and concepts of meteorology.**

#### Supporting Knowledge and/or Skills

- a. Discuss the properties of high pressure and low pressure systems and their impact on air pollution.
- b. Discuss the following horizontal dispersion terms:

- Wind rose
  - Pollution rose/plume meander
- c. Describe the role of lapse rate in determining dispersion coefficients.
- Dry adiabatic lapse rate
  - Prevailing lapse rate
  - Neutral lapse rate
  - Subadiabatic lapse rate
  - Weak lapse rate
  - Inversion
  - Superadiabatic lapse rate
- d. Describe the classes of atmosphere stability, including inversions
- e. Describe the kind of information given by a wind rose and pollution rose.

***Heat Transfer, Fluid Flow and Thermodynamics***

**9. Environmental restoration personnel shall demonstrate a familiarity level knowledge of basic thermodynamics concepts and theories.**

Supporting Knowledge and/or Skills

- a. Define the following terms:
- Specific volume
  - Density
  - Specific gravity
  - Mass
  - Weight
- b. Describe the relationship between absolute pressure, gauge pressure, and vacuum.
- c. Define the following and describe their relationship:
- Energy
  - Potential Energy
  - Kinetic Energy
  - Work
  - Heat
- d. Describe the following types of thermodynamic systems:
- Isolated system
  - Open system
  - Closed system

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- e. Using the ideal gas law discuss the relationship between pressure, temperature, and volume.
- f. Describe the effects of pressure and temperature changes on confined fluids.
- g. Describe how the density of a fluid varies with temperature.
- h. Define the term buoyancy.
- i. Describe the relationship between the pressure in a fluid column and the density and depth of the fluid.
- j. Define the property of viscosity.
- k. Define the term head, head loss, and frictional loss, with respect to its use in fluid flow.

### *Engineering Drawings*

#### **10. Environmental restoration personnel shall demonstrate a working level knowledge of engineering drawings.**

##### Supporting Knowledge and/or Skills

- a. Given an engineering drawing, read and interpret the information contained in the title block, the notes and legend, the revision block, and the grid.
- b. Identify the symbols used on engineering P&IDs for:
  - Types of valves and actuators
  - Basic types of instrumentation.
  - Types of instrument signal controllers and modifiers
  - Types of system components (pumps, etc.)
  - Types of lines
- c. Identify the symbols used on engineering P&IDs to denote the location of instruments, indicators, and controllers.
- d. Identify how valve conditions are depicted.
- e. Determine system flowpath(s) for a given valve lineup.

*Environmental Technologies*

**11. Environmental restoration personnel shall demonstrate a working level knowledge of the principles and concepts of environmental restoration.**

Supporting Knowledge and/or Skills

- a. Discuss the currently available investigation, characterization and data management technologies for environmental restoration.
- b. Discuss the various currently available remediation technologies and their applications.

**12. Environmental restoration personnel shall demonstrate a familiarity level knowledge of evaluating technologies.**

- a. Discuss the Department's policies and procedures for screening technologies.
- b. Describe the process for performing an analysis of alternative environmental restoration options.

*Problem Analysis*

**13. Environmental restoration personnel shall demonstrate a working level knowledge of problem analysis principles and techniques necessary to identify problems, determine potential causes of the problems, and identify corrective actions.**

Supporting Knowledge and/or Skills

- a. Describe and explain the application of problem analysis techniques including the following:
  - Root Cause Analysis
  - Causal Factor Analysis
  - Change Analysis
  - Barrier Analysis
- b. Describe and explain the application of the following Root Cause Analysis processes in the performance of occurrence investigations:
  - Events and Causal Factors Charting
  - Root Cause Coding
  - Recommendation Generation
- c. Compare and contrast Type A and Type B accident investigations and discuss an example of the application of each.
- d. Explain the necessity for and differences between the immediate, short term, and long term actions taken as the result of a problem identification or occurrence.

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- e. Explain and apply problem analysis techniques to the identification of potential problems and/or the prevention of problems. Include data gathering techniques and the use of trending/history in your explanation.
- f. Participate in a contractor problem analysis and critique the results.

### OPERATIONAL KNOWLEDGE

#### *Environmental Protection Program*

#### **14. Environmental restoration personnel shall demonstrate a working level knowledge of Department of Energy (DOE) Order 5400.1, General Environmental Protection Program.**

##### Supporting Knowledge and/or Skills

- a. State the purpose of DOE Order 5400.1, General Environmental Protection Program.
- b. Define the following terms:
  - Effluent
  - Environmental Monitoring
  - Environmental Protection Standard
  - Effluent Monitoring
  - Environmental Surveillance
  - Environmental Occurrence
  - Waste Minimization
- c. Discuss the Department's policy pertaining to the environmentally safe and sound operation of its facilities.
- d. Discuss the Department's policy pertaining to the minimization of waste.
- e. Discuss the requirements for Notification and Reports. Include the following as a minimum:
  - Office of Management and Budget Circular A-106
- f. Discuss the requirements for an Environmental Monitoring Plan.

#### *Environmental Monitoring*

#### **15. Environmental restoration personnel shall demonstrate a working level knowledge of monitoring techniques related to environmental restoration.**

##### Supporting Knowledge and/or Skills

- a. Describe the types of equipment used to monitor a site for the following:
  - Ambient air quality
  - Emissions
  - Groundwater contamination

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- Meteorological factors
  - River and stream contamination
  - Soil and sediment contamination
  - Wildlife contamination
- b. Describe the requirements of the following documents as they relate to environmental monitoring:
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
  - Resource Conservation and Recovery Act (RCRA)
  - National Environmental Policy Act (NEPA)
- c. Describe the various quality assurance and quality control programs used to enhance data quality. Include in your discussion programs both internal and external to the Department.
- d. Given a sampling parameter/equipment, describe the standard sampling methods and protocols.

### **16. Environmental restoration personnel shall demonstrate a working level knowledge of the purpose and uses of environmental sampling and monitoring equipment.**

#### Supporting Knowledge and/or Skills

- a. Explain the reason for measuring emissions, meteorological factors and ambient air quality under various operation conditions (e.g., routine and emergency).
- b. Describe the purpose and limitations of the following air quality measurement instruments.
- High volume particulate sampler
  - Liquid bubbler (e.g., for sulfur dioxide)
  - Infrared spectrometer
- c. Describe the purpose and types of material collected by the following sampling media:
- High efficiency glass fiber filter
  - Activated charcoal cartridge
  - Silica gel
- d. Describe the purpose for measuring each of the following parameters during field surveys of water quality:
- Temperature
  - Dissolved oxygen
  - Conductivity
  - pH
- e. Discuss the factors that can affect readings and the preservation methods for the field measurements listed above.
- f. Describe how trace toxic organics in water are assayed by gas chromatography.

- g. Describe how heavy metals in water are measured using atomic absorption spectrophotometry.
- h. Describe how volatile organics are measured.

***INDUSTRIAL SAFETY***

**17. Demonstrate working-level knowledge of the Occupational Safety and Health Act (OSHA) requirements (and Mine Safety and Health Act (MSHA) requirements where facility applicable) in the following documents:**

- DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees
- 29 CFR 1910, Occupational Safety and Health Standards
- 29 CFR 1926, Safety and Health Regulations for Construction
- 30 CFR 57, Safety and Health Standards – Underground Metal and Nonmetal Mines
- 30 CFR 58, Health Standards for Metal and Nonmetal Mines
- All other applicable portions of MSHA regulations found at 30 CFR Subchapters A-K (Parts 1-199)

Supporting Knowledge and/or Skills

- a. Discuss the application and impact of OSHA and/or MSHA on Department projects.
- b. Identify the requirements in the OSHA and/or MSHA that form the basis of authority for project management personnel in the oversight and management of a project.
- c. Discuss the project manager responsibilities set forth in DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees.
- d. Discuss the construction contractor's responsibilities under DOE 440.1A, Worker Protection Management for DOE Federal and Contractor Employees:
  - Establishing a safety program
  - Worksite presence during work activities
  - Compliance by subcontractors
- e. Discuss the requirements for the performance of a hazard analysis and a hazard abatement/prevention program. Include in the discussion each of the following elements:
  - Responsibility for implementation
  - Purpose and content of the hazard analysis
  - Worker awareness of the hazards and hazard abatement/prevention program
- f. Discuss the contractor's responsibility for providing necessary training to employees in the area of safety and health on the worksite.
- g. Discuss the project manager's responsibility for on-site safety and health inspections.
- h. Discuss the contractor's required response to an identified safety and/or health hazard.

**18. Environmental restoration personnel shall demonstrate a working level knowledge of the requirements for the use of personal protective equipment.**

Supporting Knowledge and/or Skills

- a. Describe the principles governing the selection, use, and limitations of the following:
  - Respirators
  - Protective clothing
  - MSHA approved self-rescue devices (at applicable sites)
- b. Describe the various types of equipment (devices or clothing) worn to protect a worker from exposure to hazardous substances and physical injury.
- c. Given a work procedure and atmospheric conditions, identify the appropriate type of respiratory protection for the activity.
- d. Describe the four levels of protection for workers at hazardous waste sites or for those workers conducting emergency response activities as defined by the Environmental Protection Agency.

**19. Environmental restoration personnel shall demonstrate a familiarity level knowledge of the safety-related requirements for hazardous substances.**

Supporting Knowledge and/or Skills

- a. Discuss the hazards associated with the use of corrosives (acids and alkalis).
- b. Describe the general safety precautions necessary for the handling, storage, and disposal of corrosives.
- c. Discuss the general safety precautions regarding toxic compounds.
- d. Describe the criteria used to determine if a compound is a health hazard and discuss the methods by which toxic compounds may enter the body.
- e. Discuss the general safety precautions regarding the use, handling, and storage of compressed gases, including specifically hydrogen, oxygen, and nitrogen.
- f. Discuss the safety precautions for working with cryogenic liquids.
- g. Explain the difference between a flammable liquid and a combustible liquid.
- h. Describe the general safety precautions regarding the use, handling, and storage of flammable and combustible liquids.

**20. Environmental restoration personnel shall demonstrate a working level knowledge of hazardous waste operations and their impact on worker safety and health.**

Supporting Knowledge and/or Skills

- a. Describe the industrial process associated with hazardous waste operations as they pertain to environmental restoration.
- b. Explain the personnel hazards associated with the following
  - Polychlorinated Biphenyls (PCB) removal
  - Asbestos removal
  - Biological hazards
  - Solvents
  - Paint removal
  - Waste oil

**21. Environmental restoration personnel shall demonstrate a working level knowledge of the principles, concepts, and requirements of environmental risk assessment.**

Supporting Knowledge and/or Skills

- a. Define risk assessment, risk management, and risk communication.
- b. Describe the four steps of a risk assessment.
- c. Describe how risk assessment helps in site decision-making.
- d. Define the term "Baseline Risk Assessment."
- e. Describe the process for a Toxicity Assessment.
- f. Describe the process for an Exposure Assessment.
- g. Describe the process used to characterize risk.
- h. Define the term "dose" and explain how it differs from "risk" as used in CERCLA.

**22. Environmental restoration personnel shall demonstrate a working level knowledge of the purpose and requirements of DOE O 5400.5, Radiation Protection of the Public and Environment.**

Supporting Knowledge and/or Skills

- a. State the Department's policy and discuss the objectives regarding the protection of the public and the environment from radiation as contained in DOE O 5400.5.

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- b. List and discuss the factors that must be considered pertaining to the release of materials and equipment having residual radioactive material as outlined in Chapter IV of the order, Residual Radioactive Material Cleanup.
- c. Identify and discuss the concepts of Derived Concentration Guides and surface release criteria.

### FUNCTIONAL AREA SPECIFIC

#### *Project Management*

#### **23. Environmental restoration personnel shall demonstrate a working knowledge of the purpose and requirements of DOE O 430.1A, Life Cycle Asset Management related to environmental restoration projects.**

##### Supporting Knowledge and/or Skills

- a. Describe the purpose, scope, and application of the requirements detailed in DOE O 430.1A, Life Cycle Asset Management.
- b. Discuss the four basic actions to be performed prior to completion of mission activities or prior to transfer or disposition to ensure that facility systems are placed in stable and known conditions and that hazards are identified and known.
- c. Discuss the process and requirements for disposition of physical assets, including the specific requirements for contaminated facility disposition.
- d. Using DOE O 430.1A, Life Cycle Asset Management, prepare an action plan which adequately outlines interviews and observations, and details documents to review during an evaluation of contractor compliance with the requirements of DOE O 430.1A, Life Cycle Asset Management.
- e. Evaluate contractor compliance with the requirements of DOE O 430.1A, Life Cycle Asset Management. During this evaluation, demonstrate the ability to properly conduct interviews, observations, and document reviews.
- f. Given data from an evaluation, analyze the results of the evaluation to determine contractor compliance or noncompliance of the requirements.

#### **24. Environmental restoration shall demonstrate a working level knowledge of financial management necessary to integrate program resources and apply those resources to meet project commitments as described in Department of Energy (DOE) Guide 430.1-1, Life Cycle Asset Management.**

##### Supporting Knowledge and/or Skills

- a. Define the term "Work Breakdown Structure" and discuss the process for developing one.
- b. Define and compare the terms "cost estimate" and "budget."
- c. Describe the process for preparing cost estimates and budgets.

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- d. Describe and compare labor and non-labor costs.
- e. Describe and compare direct and indirect costs.
- f. Discuss methods of reducing indirect costs.
- g. Discuss the importance of determining the measure for work performed before work starts.
- h. Describe methods for measuring work performed.
- i. Discuss schedule and cost variance.
- j. Given actual project management documentation and data, identify budgeted cost of work scheduled, budgeted cost of work performed, actual cost of work performed, and determine the schedule variance and cost variance.
- k. Describe the types of Earned Value and how they are measured.
- l. Explain what is meant by the term "baseline" as it relates to project management.
- m. Describe the types of data required to forecast cost and schedule performance.
- n. Define the term "Life Cycle Cost Estimate."
- o. Given sample data, calculate "Life Cycle Cost Estimate."
- p. Discuss the importance of formal change control with regard to project management.
- q. Discuss the use of strategic planning, and how such planning relates to ongoing operations and safety of operations.

### **25. Environmental restoration shall demonstrate familiarity-level knowledge of Project Risk Assessment.**

#### Supporting Knowledge and/or Skills

- a. Perform an assessment of project risks that identifies critical systems, subsystems, and other factors that require focused work and resolution.
- b. Identify the types of risks that are addressed in a project risk assessment.
- c. Evaluate the assessed level of risk.
- d. Describe the basis for the risk assessment.
- e. Identify the critical project elements that contribute to the risk.
- f. Identify the consequences of the risk.
- g. Develop activities and alternatives to minimize the risk.

h. Identify the stage(s) of the project in which the risk exists.

**26. Environmental restoration personnel shall demonstrate a working level knowledge of configuration management principles to satisfy the project's technical and operational requirements.**

Supporting Knowledge and/or Skills

- a. Discuss the objectives of configuration management.
- b. Describe the following elements of configuration management:
  - Configuration identification
  - Configuration control
  - Configuration recording and reporting
  - Waivers and deviations
- c. Discuss the revision process for technical baselines over the life of a project, including an explanation of each of the following terms:
  - Functional requirements baseline
  - Technical requirements baseline

**27. Environmental restoration personnel shall demonstrate a working level knowledge of the principles of streamlining and maximizing cost-effectiveness.**

Supporting knowledge and/or skills

- a. Define and discuss the following terms:
  - early response action
  - problem statement
  - uncertainty
  - data needs
  - core team
  - expedited site characterization
- b. Discuss what should precede the development of a sampling and analysis plan.
- c. Discuss the composition and role of a core team for ER projects.
- d. Discuss uncertainty, as it is associated with characterization, and the ways in which it can be managed.
- e. Discuss the importance of a concise problem statement for ER projects
- f. Define the following terms:
  - Risk-Based Concentration (RBC)

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- Maximum Contaminant Level (MCL)
- Remedial Goal Option (RGO)
- background
- action level
- data quality objectives

### *Environmental Laws, Regulations and Department Directives*

#### **28. Environmental restoration personnel shall demonstrate a working level knowledge of the following Department of Energy (DOE) directives:**

- DOE P 450.1, General Environmental Protection Program
- DOE O 231.1, Environmental Safety and Health Reporting

#### Supporting Knowledge and/or Skills

- a. Discuss the relationship between Comprehensive Environmental Response, Compensation, and Liability Act and DOE P 450.1, General Environmental Protection Program.
- b. Identify and explain the guiding principles for environmental restoration personnel in performing their duties.
- c. Discuss the purpose of the Annual Site Environmental Report as outlined in DOE O 231.1, Environmental Safety and Health Reporting.

#### **29. Environmental restoration personnel shall demonstrate a working level knowledge of the purpose and processes required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as outlined in the National Contingency Plan.**

#### Supporting knowledge and/or Skills

- a. Discuss the general purpose of CERCLA as it applies to risks to human health and the environment resulting from releases or threatened releases of hazardous substances into the environment.
- b. Identify what constitutes a hazardous substance under CERCLA.
- c. Explain the intent of the Hazardous Substance Response Trust Fund.
- d. Describe the National Oil and Hazardous Substance Response Trust Fund.
- e. Describe when a hazardous substance release is subject to CERCLA reporting requirements.
- f. Describe the objectives of the National Priorities List and Hazard Ranking System.
- g. List the processes associated with the Hazardous Substance Response Process.
- h. Discuss the Department's CERCLA policies and procedures.

**30. Environmental restoration personnel shall demonstrate a working level knowledge of the following document development, review and assessment under CERCLA.**

- Remedial Investigation Feasibility Study Work Plan
- Investigative Work Plan Report
- Permits
- Records of Decision
- Remedial Design
- Remedial Action Work Plan
- Consent Order and Settlement Agreement
- Proposed Plan
- Applicable, Relevant and Appropriate Requirements (ARARs)

Supporting Knowledge and/or Skills

- a. Describe the process for developing the elements of the above listed documents.
- b. Discuss the format that is to be used and the guidance available for developing each document.
- c. Discuss the requirements set forth for each document and describe the process for reviewing these documents.
- d. Conduct a review or assessment of at least three of the above listed documents.

**31. Environmental restoration personnel shall demonstrate a working level knowledge of the Clean Air Act (CAA) and implementing regulations.**

Supporting Knowledge and/or Skills

- a. Discuss the application of the Clean Air Act to the Department of Energy or its facilities.
- b. Identify the National Ambient Air Quality Standards (primary and secondary) and the National Emission Standards for Hazardous Air Pollutants (NESHAP).
- c. Describe the requirements for permitting, monitoring and reporting prescribed in the regulations that implement Title V of the Clean Air Act.
- d. Describe the prevention of significant deterioration (PSD) regarding the requirements established by the Clean Air Act.
- e. Discuss the modeling requirements for monitoring and close calculation air dispersion in the National Emissions Standards for Hazardous Air Pollutants, Standards for Radionuclides.
- f. Identify the major sources and emission limitations per the Clean Air Act, Title I.
- g. Discuss the New Source Performance Standards (40 CFR 60).
- h. Discuss the potential liabilities of the Department of Energy and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).

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- i. Discuss the National Emissions Standards for Hazardous Air Pollutants air emission limits.
- j. Describe the Clean Air Act, Title V, Stratospheric Ozone Protection criteria.
- k. Discuss the requirements for control technologies specified in the Clean Air Act and the purpose and function of various air pollutant abatement technologies.
- l. Describe the four basic classes of air pollutant abatement/control technologies specified in the Clean Air Act.
- m. Describe, in general, the purpose and function of various pollution abatement equipment/technologies.
  - Cyclones
  - Baghouse
  - Electrostatic precipitator
  - Thermal oxidizer
  - Scrubber
  - Adsorption

### **32. Environmental restoration personnel shall demonstrate a working level knowledge of the following laws as related to the environmental medium of water:**

- Clean Water Act (CWA)
- Safe Drinking Water Act (SDWA)
- Resource Conservation and Recovery Act (RCRA) (groundwater provisions)
- National Groundwater Protection Policy (NGPP)
- Oil Pollution Act
- Rivers and Harbors Act (RHA)

#### Supporting Knowledge and/or Skills

- a. Discuss the application of the above laws to the Department of Energy and its facilities.
- b. Describe water quality criteria and stream use classification identified in the Clean Water Act.
- c. Discuss the Clean Water Act permitting requirements including monitoring and reporting. Include in the discussion, National Pollutant Discharge Elimination System Program and the Rivers and Harbors Act Dredge/Fill material permits.
- d. Describe the reporting requirements identified in the Clean Water Act.
- e. Discuss the standards for maximum contaminant levels (primary and secondary) contained in the Safe Drinking Water Act.
- f. Describe the provisions for notification to consumers as outlined by the Safe Drinking Water Act.
- g. Discuss the Safe Drinking Water Act Underground Injection Control Program.
- h. Describe the standard methods for the examination of water and wastewater.

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- i. Discuss the Safe Drinking Water Act permitting requirements.
- j. Describe the aquifer protection (sole source) regulations of the Safe Drinking Water Act.
- k. Discuss the cross-connection identification/elimination and back-flow prevention regulations described in the Safe Drinking Water Act.
- l. Describe the groundwater protection requirements applicable to interim status Resource Conservation and Recovery Act's (RCRA) facilities in RCRA's implementing regulations, Subpart F of 40 CFR 265.
- m. Describe the groundwater protection requirements applicable to permitted Resource Conservation and Recovery Act (RCRA) facilities in RCRA's implementing regulations, Subpart F of 40 CFR 264 and in the facility's permit.
- n. Discuss the storm water management aspects of the National Pollutant Discharge Elimination Standard (NPDES).
- o. Explain the spill prevention and control requirements of the Clean Water Act (40 CFR 109-114).

**33. Environmental restoration personnel shall demonstrate the ability to appraise the contractor's program(s) and/or permits to assess compliance with the requirements for the environmental medium of water.**

Supporting Knowledge and/or Skills

- a. Given a proposed permit, verify that the Water Quality Criteria and Stream Use Classification as identified in the Clean Water Act has been correctly applied.
- b. Review the contractor's program for compliance with the Clean Water Act's reporting requirements.
- c. During an assessment of an existing facility, verify that the pre-treatment standards contained in the Clean Water Act are being met.
- d. During an assessment of the contractor's sampling and monitoring program, verify that the standards for maximum contaminant levels (primary and secondary) provided by the Safe Drinking Water Act are being met.
- e. Conduct an assessment of the contractor's program to verify that the Safe Drinking Water Act provisions for notification to consumers have been established.
- f. Perform an assessment of underground injection procedures and monitoring, and assess for compliance with the restrictions and controls provided by the Safe Drinking Water Act.
- g. Conduct an assessment to ensure the contractor's program is in compliance with the Standard Methods for the examination of water and wastewater or other acceptable protocol as detailed in 40 CFR 136, Analytical Test Procedures.

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- h. Review the contractor's program(s) for adequate provisions to ensure that the cross-connection identification/elimination and back-flow prevention is as described by the Safe Drinking Water Act.
- i. Prior to closure of a permit, review it for compliance with the Resource Conservation and Recovery Act requirements for groundwater protection.

### **34. Environmental restoration personnel shall demonstrate a working level knowledge of the implementation of the regulations and requirements of the National Environmental Policy Act (NEPA).**

#### Supporting Knowledge and/or Skills

- a. Explain the purpose and scope of the Council on Environmental Quality regulations implementing the National Environmental Policy Act (40 CFR 1500-1508).
- b. Discuss the purpose and scope of DOE O 451.1A, National Environmental Policy Act Compliance Program.
- c. Describe the public participation process.
- d. Discuss the integration of consultation requirements under other environmental legislation (e.g., National Environmental Policy Act and Endangered Species Act and Fish and Wildlife Coordination Act).
- e. Discuss the content and procedures specified by the Department implementing regulations 10 CFR 1021, Compliance with the National Environmental Policy Act, and DOE O 451.1B, National Environmental Policy Act Compliance Program.
- f. Participate in the preparation of the documents listed below.
  - Environmental Impact Statement (EIS)
  - Environmental Assessment (EA)
  - Finding Of No Significant Impact (FONSI)
  - Categorical Exclusion (CX)
  - Record of Decision (ROD)
- g. Discuss the potential liabilities of the Department and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).

### **35. Environmental restoration personnel shall demonstrate the ability to review and assess the following National Environmental Policy Act documentation:**

- Environmental Impact Statement (EIS)
- Environmental Assessment (EA)
- Finding Of No Significant Impact (FONSI)
- Categorical Exclusion (CX)
- Record of Decision (ROD)

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### Supporting Knowledge and/or Skills

- a. Discuss the requirements for each document and describe the process for reviewing the above listed documents.
- b. Describe the process for performing an assessment of the above listed documents and discuss criteria that could be used during an assessment.
- c. Perform a written review/assessment of each of the above listed documents.
- d. Discuss the relationship between 40 CFR 1500, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, and DOE O 451.1B, National Environmental Policy Act Compliance Program.

### **36. Environmental restoration personnel shall demonstrate a working level knowledge of the following laws, regulations, and Department of Energy Orders as related to environmental radiation:**

- Atomic Energy Act
- 40 CFR 61 Subpart H, National Emission Standards for Hazardous Air Pollutants
- 40 CFR 141, National Primary Drinking Water Regulations.
- DOE O 5400.1, General Environmental Protection Program
- DOE O 5400.5, Radiation Protection of the Public and the Environment
- DOE O 435.1, Radioactive Waste Management
- 40 CFR 122, EPA Administered Permit Programs: The National Pollutant Discharge Elimination System

### Supporting Knowledge and/or Skills

- a. Discuss the application of the above listed documents to the Department of Energy and its facilities.
- b. Define the following terms and their implications for regulation in the Department of Energy:
  - Source material
  - Special nuclear material
  - Byproduct material
  - Naturally occurring or accelerator-produced radioactive material
- c. Describe the concept of Reportable Quantity and identify that quantity for a given radionuclide.
- d. Describe the system for classifying mixed waste and the general requirements for treatment, storage and disposal.
- e. Describe the basic monitoring and reporting requirements of radionuclides in National Emissions Standards for Hazardous Air Pollutants and state the dose limit.
- f. Describe the basic limits for radionuclides in drinking water and their application to Department operations.

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g. Describe the following types of radioactive waste and the associated requirements:

- Low-level waste
- High-level waste
- Transuranic waste

**37. Environmental restoration personnel shall demonstrate the ability to appraise the contractor's program(s) to assess compliance with the requirements for environmental radiation protection.**

### Supporting Knowledge and/or Skills

- a. Assess whether the effluent monitoring from a facility meets the requirements of DOE O 5400.5, Radiation Protection of the Public and the Environment.
- b. Assess whether adequate methods are used to characterize effluents for purposes of limiting doses to the public in accordance with regulatory and "as low as reasonably achievable (ALARA)" limits.

**38. Environmental restoration personnel shall demonstrate a working level knowledge of the supporting environmental laws and regulations including:**

- Pollution Prevention Act (PPA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
- Toxic Substances Control Act (TSCA)
- Endangered Species Act (ESA)
- Comprehensive Environmental Response, Compensation & Liability Act/Superfund Amendments and Reauthorization Act (Superfund)
- Emergency Planning and Community Right-to-Know Act (EPCRA)
- Atomic Energy Act
- Federal Facilities Compliance Act (FFCA)

### Supporting Knowledge and/or Skills

- a. Describe the deadlines identified in the Pollution Prevention Act.
- b. Identify the disciplines/areas in which Pollution Prevention Act applies.
- c. Describe the process for licensing applicators as defined in the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).
- d. Discuss the purpose and history of Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act (Superfund).
- e. Explain how the Reportable Quantities (RQ) specified by Comprehensive Environmental Response, Compensation, and Liability Act are applied.
- f. Describe the removal/cleanup actions required by Comprehensive Environmental Response, Compensation, and Liability Act/Resource Conservation and Recovery Act.

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- g. Discuss the interface/coordination with environmental restoration efforts required by Comprehensive Environmental Response, Compensation, and Liability Act/Resource Conservation and Recovery Act.
- h. Describe the application of the Emergency Planning and Community Right-to-Know Act to Department facilities (e.g., Toxic Release Inventory and coordination requirements with local emergency planning committees).
- i. Discuss the Endangered Species Act consultation requirements.
- j. Discuss the marking of PCS and PCB items required by the Toxic Substances Control Act.
- k. Describe how the Federal Facilities Compliance Act will impact Department compliance actions.

### **39. Environmental restoration personnel shall demonstrate a working level knowledge of the management and negotiation of regulatory agreements and permits.**

#### Supporting Knowledge and/or Skills

- a. Describe the requirements, methods of negotiation, and responsibilities involved with the management of the following documents:
  - National Pollutant Discharge Elimination System Permit
  - Federal Facility Agreement
  - Consent Orders & Settlement Agreements
  - Record Of Decision
  - Resource Conservation and Recovery Act Part B Permit
  - Grant conditions

### **40. Environmental restoration personnel shall demonstrate a working level knowledge of the requirements for managing environmental compliance data.**

#### Supporting Knowledge and/or Skills

- a. Describe the relationship of the following documents to the data management requirements of environmental compliance:
  - DOE O 414.1A, Quality Assurance
  - NQA-1, Quality Assurance Program Requirements for Nuclear Facilities
  - DOE G 1324.5B, Records Management
  - DOE O 5400.5, Radiation Protection of the Public and the Environment
- b. Describe the quality assurance requirements for monitoring radiological air emissions specified in the National Emissions Standards for Hazardous Air Pollutants.
- c. Describe the Mean Relative Difference (MRD) statistical evaluations required by the Quality Assessment Program (QAP) for Department Laboratories. Include in your discussion the purpose of the three types of evaluations (duplicate, blind-sample, and split-sample) performed.

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- d. Describe the program administered by the Department's Environmental Measurements Laboratory to assess the quality of environmental data reported to the Department.

### *Waste Management*

#### **41. Environmental restoration personnel shall demonstrate familiarity level knowledge of hazardous waste as described in 40 CFR, Resource Conservation and Recovery Act (RCRA).**

##### Supporting Knowledge and/or Skills

- a. Define the term "hazardous waste."
- b. Using the decision tree in 40 CFR Part 260, relate RCRA solid waste to hazardous waste and identify the applicable RCRA regulations for each.
- c. Identify the kinds of hazardous wastes generated within the Department and their sources.
- d. Describe the combination of facilities used to manage hazardous wastes at a site.
- e. Discuss the current methods of disposing of hazardous wastes.
- f. Explain the relationship between the Resource Conservation and Recovery Act and the Federal Facilities Compliance Act (FFCA). Include in your discussion the development of Site Treatment Plans and development of Waste Treatment Technologies.
- g. Describe the types of facilities that need Resource Conservation and Recovery Act permits; list differences between a RCRA Part A and a RCRA Part B permit application; and give examples of RCRA Part B permit application requirements that apply to all facilities and those that apply to specific types of facilities.
- h. Describe how to determine if a material is a solid waste. Given a material that is a solid waste, describe how to determine if it is a hazardous or a mixed waste.
- i. Discuss the Land Disposal Restrictions, including the different types of treatment standards, the dilution prohibition, the storage prohibition, and different types of variances and exemptions.
- j. Discuss the regulatory requirements applicable to Federal facility solid waste landfills (including Resource Conservation and Recovery Act Subtitle D).
- k. Discuss the Personal Protective Equipment (PPE) requirements for work activities in hazardous areas.
- l. Discuss the potential liabilities of the Department of Energy and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).
- m. Discuss the waste management requirements for polychlorinated biphenyls (PCBs) outlined by the Toxic Substances Control Act (TSCA).

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- n. Discuss the Resource Conservation and Recovery Act underground storage tank regulations (Subtitle I).
- o. Describe the relationship of the Hazardous Materials Transportation Act (49 CFR Parts 170-179) to the Resource Conservation and Recovery Act transportation regulations (40 CFR Part 263).

### **42. Environmental restoration personnel shall demonstrate familiarity-level knowledge of the management of radioactive waste as described in:**

- DOE O 435.1, Radioactive Waste Management
- DOE M 435.1-1, Radioactive Waste Management

#### Supporting Knowledge and/or Skills

- a. Discuss the requirements identified in DOE O 435.1, Radioactive Waste Management, for the following types of waste:
  - Low-level
  - High-level
  - Transuranic
- b. Discuss the Department's performance objectives and performance assessment for disposal of low-level radioactive waste as outlined in DOE M 435.1-1, Radioactive Waste Management.
- c. Discuss the low-level waste characterization requirements.
- d. Describe the Department's low-level radioactive waste acceptance criteria.
- e. Discuss the basic requirements for a low-level disposal site closure and for post closure operations.
- f. Define the term "mixed waste."
- g. Identify the applicable regulations and DOE Order for managing mixed low-level radioactive waste.

### **REQUALIFICATION REQUIREMENTS**

None.

**APPENDIX A  
CONTINUING EDUCATION, TRAINING AND PROFICIENCY PROGRAM**

The following list represents suggested continuing education, training and other opportunities that are available for DOE personnel after completion of the competency requirements in this technical Functional Area Qualification Standard. It is extremely important that personnel involved with this program maintain their proficiency through continuing education, training, reading, or other activities such as workshops, seminars, and conferences. The list of suggested activities was developed by the Subject Matter Experts involved in the development of the Functional Area Qualification Standard and is not all inclusive.

**LIST OF CONTINUING EDUCATION, TRAINING AND OTHER ACTIVITIES**

Environmental restoration personnel shall participate in an Office/Facility-specific continuing training and qualification program that includes the following elements:

1. Continuing technical education and/or training covering topics directly related to the environmental restoration area as determined appropriate by management. This may include courses/training provided by Department of Energy, other government agencies, outside vendors, or local educational institutions. Continuing training topics should also address identified weaknesses in the knowledge or skills of the individual personnel.
2. Actively perform the duties of an environmental restoration specialist at a Department of Energy facility a minimum of 24 hours per year.
3. Specific continuing training requirements shall be documented in Individual Development Plans.

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CONCLUDING MATERIAL

**Review Activity:**

EM  
DP-NNSA  
EH  
NE  
SC

**Preparing Activity:**

DOE-EM-5

**Project Number:**

TRNG-0027

**Field and Operations Offices**

AL  
CBFO  
CH  
ID  
NV  
OAK  
OH  
OR  
ORP  
RF  
RL  
SR

**Area and Site Offices**

Amarillo Site Office  
Argonne Area Office  
Brookhaven Area Office  
Fermi Area Office  
Kansas City Site Office  
Kirtland Site Office  
Los Alamos Site Office  
Princeton Area Office  
Y-12 Site Office

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