

PART M

LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

Sec. M.1 Purpose and Scope

- a. The regulations in this Part establish procedures, criteria, and terms and conditions upon which the Agency issues licenses for the land disposal of wastes received from other persons. [Applicability of the requirements in this Part to Agency licenses for waste disposal facilities in effect on the effective date of this regulation will be determined on a case-by-case basis and implemented through terms and conditions of the license or by orders issued by the Agency.] The requirements of this Part are in addition to, and not in substitution for, other applicable requirements of these regulations.
- b. The regulations in this Part do not apply to disposal of byproduct material as defined in definition (2) of "Byproduct material" in Section A.2 of these regulations in quantities greater than 10,000 kilograms containing more than 5 millicuries of radium-226 or disposal of radioactive material as provided for in Part D of these regulations.
- c. This Part establishes procedural requirements and performance objectives applicable to any method of land disposal. It establishes specific technical requirements for near-surface disposal of radioactive waste which involves disposal in the uppermost portion of the earth.

Sec. M.2 Definitions. As used in this Part, the following definitions apply:

"Active maintenance" means any significant activity needed during the period of institutional control to maintain reasonable assurance that the performance objectives in Sections M.19 and M.20 are met. Such active maintenance includes ongoing activities such as the pumping and treatment of water from a disposal unit or one-time measures such as replacement of a disposal unit cover. Active maintenance does not include custodial activities such as repair of fencing, repair or replacement of monitoring equipment, revegetation, minor additions to soil cover, minor repair of disposal unit covers, and general disposal site upkeep such as mowing grass.

"Buffer zone" means a portion of the disposal site that is controlled by the licensee and that lies under the disposal units and between the disposal units and the boundary of the site.

"Commencement of construction" means any clearing of land, excavation, or other substantial action that would adversely affect the environment of a land disposal facility. The term does not mean disposal site exploration, necessary roads for disposal site exploration, borings to determine foundation conditions, or other preconstruction monitoring or testing to establish background information related to the suitability of the disposal site or the protection of environmental values.

"Custodial agency" means an agency of the government designated to act on behalf of the government owner of

the disposal site.

"Disposal" means the isolation of wastes from the biosphere inhabited by man and his food chains by emplacement in a land disposal facility.

"Disposal site" means that portion of a land disposal facility which is used for disposal of waste. It consists of disposal units and a buffer zone.

"Disposal unit" means a discrete portion of the disposal site into which waste is placed for disposal. For near-surface disposal, the unit is usually a trench.

"Engineered barrier" means a man-made structure or device that is intended to improve the land disposal facility's ability to meet the performance objectives in this Part.

"Hydrogeologic unit" means any soil or rock unit or zone which by virtue of its porosity or permeability, or lack thereof, has a distinct influence on the storage or movement of groundwater.

"Inadvertent intruder" means a person who might occupy the disposal site after closure and engage in normal activities, such as agriculture, dwelling construction, or other pursuits in which an individual might be unknowingly exposed to radiation from the waste.

"Intruder barrier" means a sufficient depth of cover over the waste that inhibits contact with waste and helps to ensure that radiation exposures to an inadvertent intruder will meet the performance objectives set forth in this Part, or engineered structures that provide equivalent protection to the inadvertent intruder.

"Land disposal facility" means the land, buildings, and equipment which is intended to be used for the disposal of wastes into the subsurface of the land.

"Monitoring" means observing and making measurements to provide data to evaluate the performance and characteristics of the disposal site.

"Near-surface disposal facility" means a land disposal facility in which waste is disposed of within approximately the upper 30 meters of the earth's surface.

"Site closure and stabilization" means those actions that are taken upon completion of operations that prepare the disposal site for custodial care and that assure that the disposal site will remain stable and will not need ongoing active maintenance.

"Stability" means structural stability.

"Surveillance" means monitoring and observation of the disposal site for purposes of visual detection of need for maintenance, custodial care, evidence of intrusion, and compliance with other license and regulatory

requirements.

General Regulatory Provisions

Sec. M.3 License Required

- a. No person may receive, possess, and dispose of waste received from other persons at a land disposal facility unless authorized by a license issued by the Agency pursuant to this Part, and Part C of these regulations.
- b. Each person shall file an application with the Agency pursuant to Section C.24 of these regulations and obtain a license as provided in this Part before commencement of construction of a land disposal facility. Failure to comply with this requirement may be grounds for denial of a license.

Sec. M.4 Reserved

Sec. M.5 Content of Application. In addition to the requirements set forth in Section C.25 of these regulations, an application to receive from others, possess, and dispose of wastes shall consist of general information, specific technical information, institutional information, and financial information as set forth in Sections M.6 through M.10.

Sec. M.6 General Information. The general information shall include each of the following:

- a. Identity of the applicant including:
 - i. The full name, address, telephone number, and description of the business or occupation of the applicant;
 - ii. If the applicant is a partnership, the name and address of each partner and the principal location where the partnership does business;
 - iii. If the applicant is a corporation or an unincorporated association, (i) the state where it is incorporated or organized and the principal location where it does business, and (ii) the names and addresses of its directors and principal officers; and
 - iv. If the applicant is acting as an agent or representative of another person in filing the application, all information required under Paragraph M.6a. must be supplied with respect to the other person.
- b. Qualifications of the applicant:

- i. The organizational structure of the applicant, both offsite and onsite, including a description of lines of authority and assignments of responsibilities, whether in the form of administrative directives, contract provisions, or otherwise;
 - ii. The technical qualifications, including training and experience, of the applicant and members of the applicant's staff to engage in the proposed activities. Minimum training and experience requirements for personnel filling key positions described in Subparagraph M.6b.i. must be provided.
 - iii. A description of the applicant's personnel training program; and
 - iv. The plan to maintain an adequate complement of trained personnel to carry out waste receipt, handling, and disposal operations in a safe manner.
- c. A description of:
- i. The location of the proposed disposal site;
 - ii. The general character of the proposed activities;
 - iii. The types and quantities of waste to be received, possessed, and disposed of;
 - iv. Plans for use of the land disposal facility for purposes other than disposal of wastes; and
 - v. The proposed facilities and equipment.
- d. Proposed schedules for construction, receipt of waste, and first emplacement of waste at the proposed land disposal facility.

Sec. M.7 Specific Technical Information. The specific technical information shall include the following information needed for demonstration that the performance objectives and the applicable technical requirements of this Part will be met:

- a. A description of the natural and demographic disposal site characteristics as determined by disposal site selection and characterization activities. The description shall include geologic, geochemical, geotechnical, hydrologic, ecologic, archaeologic, meteorologic, climatologic, and biotic features of the disposal site and vicinity.
- b. A description of the design features of the land disposal facility and the disposal units. For near-surface disposal, the description shall include those design features related to infiltration of water; integrity of covers for disposal units; structural stability of backfill, wastes, and covers; contact of wastes with standing water; disposal site drainage; disposal site closure and stabilization; elimination to the extent

practicable of long-term disposal site maintenance; inadvertent intrusion; occupational exposures; disposal site monitoring; and adequacy of the size of the buffer zone for monitoring and potential mitigative measures.

- c. A description of the principal design criteria and their relationship to the performance objectives.
- d. A description of the design basis natural events or phenomena and their relationship to the principal design criteria.
- e. A description of codes and standards which the applicant has applied to the design and which will apply to construction of the land disposal facilities.
- f. A description of the construction and operation of the land disposal facility. The description shall include as a minimum the methods of construction of disposal units; waste emplacement; the procedures for and areas of waste segregation; types of intruder barriers; onsite traffic and drainage systems; survey control program; methods and areas of waste storage; and methods to control surface water and groundwater access to the wastes. The description shall also include a description of the methods to be employed in the handling and disposal of wastes containing chelating agents or other non-radiological substances that might affect meeting the performance objectives of this Part.
- g. A description of the disposal site closure plan, including those design features which are intended to facilitate disposal site closure and to eliminate the need for ongoing active maintenance.
- h. An identification of the known natural resources at the disposal site, whose exploitation could result in inadvertent intrusion into the wastes after removal of active institutional control.
- i. A description of the kind, amount, classification and specifications of the radioactive material proposed to be received, possessed, and disposed of at the land disposal facility.
- j. A description of the quality control program for the determination of natural disposal site characteristics and for quality control during the design, construction, operation, and closure of the land disposal facility and the receipt, handling, and emplacement of waste. Audits and managerial controls must be included.
- k. A description of the radiation safety program for control and monitoring of radioactive effluents to ensure compliance with the performance objective in Section M.19 and occupational radiation exposure to ensure compliance with the requirements of Part D of these regulations and to control contamination of personnel, vehicles, equipment, buildings, and the disposal site. Both routine operations and accidents shall be addressed. The program description must include procedures, instrumentation, facilities, and equipment.
- l. A description of the environmental monitoring program to provide data to evaluate potential health and

environmental impacts and the plan for taking corrective measures if migration is indicated.

- m. A description of the administrative procedures that the applicant will apply to control activities at the land disposal facility.

Sec. M.8 Technical Analyses. The specific technical information shall also include the following analyses needed to demonstrate that the performance objectives of this Part will be met:

- a. Pathways analyzed in demonstrating protection of the general population from releases of radioactivity shall include air, soil, groundwater, surface water, plant uptake, and exhumation by burrowing animals. The analyses shall clearly identify and differentiate between the roles performed by the natural disposal site characteristics and design features in isolating and segregating the wastes. The analyses shall clearly demonstrate that there is reasonable assurance that the exposures to humans from the release of radioactivity will not exceed the limits set forth in Section M.19.
- b. Analyses of the protection of individuals from inadvertent intrusion shall include demonstration that there is reasonable assurance the waste classification and segregation requirements will be met and that adequate barriers to inadvertent intrusion will be provided.
- c. Analyses of the protection of individuals during operations shall include assessments of expected exposures due to routine operations and likely accidents during handling, storage, and disposal of waste. The analyses shall provide reasonable assurance that exposures will be controlled to meet the requirements of Part D of these regulations.
- d. Analyses of the long-term stability of the disposal site and the need for ongoing active maintenance after closure shall be based upon analyses of active natural processes such as erosion, mass wasting, slope failure, settlement of wastes and backfill, infiltration through covers over disposal areas and adjacent soils, and surface drainage of the disposal site. The analyses shall provide reasonable assurance that there will not be a need for ongoing active maintenance of the disposal site following closure.

Sec. M.9 Institutional Information. The institutional information submitted by the applicant shall include:

- a. A certification by the Federal or State Agency which owns the disposal site that the Federal or State Agency is prepared to accept transfer of the license when the provisions of Section M.16 are met and will assume responsibility for institutional control after site closure and post-closure observation and maintenance.
- b. Where the proposed disposal site is on land not owned by the Federal or a State government, the applicant shall submit evidence that arrangements have been made for assumption of ownership in fee by the Federal or a State Agency before the Agency issues a license.

Sec. M.10 Financial Information. The financial information shall be sufficient to demonstrate that the

financial qualifications of the applicant are adequate to carry out the activities for which the license is sought and meet other financial assurance requirements of this Part.

Sec. M.11 Requirements for Issuance of a License. A license for the receipt, possession, and disposal of waste containing or contaminated with radioactive material will be issued by the Agency upon finding that:

- a. The issuance of the license will not constitute an unreasonable risk to the health and safety of the public;
- b. The applicant is qualified by reason of training and experience to carry out the disposal operations requested in a manner that protects health and minimizes danger to life or property;
- c. The applicant's proposed disposal site, disposal design, land disposal facility operations, including equipment, facilities, and procedures, disposal site closure, and post-closure institutional control are adequate to protect the public health and safety in that they provide reasonable assurance that the general population will be protected from releases of radioactivity as specified in the performance objective in Section M.19;
- d. The applicant's proposed disposal site, disposal site design, land disposal facility operations, including equipment, facilities, and procedures, disposal site closure, and post-closure institutional control are adequate to protect the public health and safety in that they will provide reasonable assurance that individual inadvertent intruders are protected in accordance with the performance objective in Section M.20;
- e. The applicant's proposed land disposal facility operations, including equipment, facilities, and procedures, are adequate to protect the public health and safety in that they will provide reasonable assurance that the standards for radiation protection set out in Part D of these regulations will be met;
- f. The applicant's proposed disposal site, disposal site design, land disposal facility operations, disposal site closure, and post-closure institutional control are adequate to protect the public health and safety in that they will provide reasonable assurance that long-term stability of the disposed waste and the disposal site will be achieved and will eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure;
- g. The applicant's demonstration provides reasonable assurance that the applicable technical requirements of this Part will be met;
- h. The applicant's proposal for institutional control provides reasonable assurance that such control will be provided for the length of time found necessary to ensure the findings in Paragraphs M.11c. through f. and that the institutional control meets the requirements of Section M.28; and
- i. The financial or surety arrangements meet the requirements of this Part.

Sec. M.12 Conditions of Licenses

- a. A license issued under this Part, or any right thereunder, may be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the license to any person, only if the Agency finds, after securing full information, that the transfer is in accordance with the provisions of the Act and gives its consent in writing in the form of a license amendment.
- [b. The licensee shall submit written statements under oath upon request of the Agency, at any time before termination of the license, to enable the Agency to determine whether the license should be modified, suspended, or revoked.]
- c. The license will be terminated only on the full implementation of the final closure plan as approved by the Agency, including post-closure observation and maintenance.
- d. The licensee shall be subject to the provisions of the Act now or hereafter in effect, and to all rules, regulations, and orders of the Agency. The terms and conditions of the license are subject to amendment, revision, or modification, by reason of amendments to, or by reason of rules, regulations, and orders issued in accordance with the terms of the Act.
- e. Each person licensed by the Agency pursuant to the regulations in this Part shall confine possession and use of materials to the locations and purposes authorized in the license.
- f. The licensee shall not dispose of waste until the Agency has inspected the land disposal facility and has found it to be in conformance with the description, design, and construction described in the application for a license.
- g. The Agency may incorporate in any license at the time of issuance, or thereafter, by appropriate rule, regulation or order, additional requirements and conditions with respect to the licensee's receipt, possession, and disposal of waste as it deems appropriate or necessary in order to:
 - i. Protect health or to minimize danger to life or property;
 - ii. Require reports and the keeping of records, and to provide for inspections of activities under the license that may be necessary or appropriate to effectuate the purposes of the Act and regulations thereunder.
- h. The authority to dispose of wastes expires on the date stated in the license. Any expiration date on a license applies only to the above ground activities and to the authority to dispose of waste. Failure to renew the license shall not relieve the licensee of responsibility for implementing site closure, post-closure observation, and transfer of the license to the site owner.

- i. Each licensee shall notify the Agency in writing immediately following the filing of a voluntary or involuntary petition for bankruptcy under any Chapter of Title 11 (Bankruptcy) of the United States Code by or against:
 - i. the licensee;
 - ii. an entity (as that term is defined in 11 U.S.C. 101(14)) controlling the licensee or listing the license or licensee as property of the estate; or
 - iii. an affiliate (as that term is defined in 11 U.S.C. 101(2)) of the licensee.
- j. The notification specified in Paragraph M.12i. shall indicate the bankruptcy court in which the petition for bankruptcy was filed and the date of the filing of the petition.

Sec. M.13 Application for Renewal or Closure

- a. An application for renewal or an application for closure under Section M.14 must be filed at least 90 days prior to license expiration.
- b. Applications for renewal of a license must be filed in accordance with Sections M.5 through M.10. Applications for closure must be filed in accordance with Section M.14. Information contained in previous applications, statements, or reports filed with the Agency under the license may be incorporated by reference if the references are clear and specific.
- c. In any case in which a licensee has filed an application in proper form for renewal of a license, the license does not expire until the Agency has taken final action on the application for renewal.
- d. In determining whether a license will be renewed, the Agency will apply the criteria set forth in Section M.11.

Sec. M.14 Contents of Application for Site Closure and Stabilization

- a. Prior to final closure of the disposal site, or as otherwise directed by the Agency, the applicant shall submit an application to amend the license for closure. This closure application shall include a final revision and specific details of the disposal site closure plan included as part of the license application submitted under Paragraph M.7g. that includes each of the following:
 - i. Any additional geologic, hydrologic, or other data pertinent to the long-term containment of emplaced wastes obtained during the operational period.
 - ii. The results of tests, experiments, or any other analyses relating to backfill of excavated areas,

closure and sealing, waste migration and interaction with emplacement media, or any other tests, experiments, or analysis pertinent to the long-term containment of emplaced waste within the disposal site.

- iii. Any proposed revision of plans for:
 - (1) Decontamination and/or dismantlement of surface facilities;
 - (2) Backfilling of excavated areas; or
 - (3) Stabilization of the disposal site for post-closure care.
 - iv. Any significant new information regarding the environmental impact of closure activities and long-term performance of the disposal site.
- b. Upon review and consideration of an application to amend the license for closure submitted in accordance with Paragraph M.14a., the Agency shall issue an amendment authorizing closure if there is reasonable assurance that the long-term performance objectives of this Part will be met.

Sec. M.15 Post-Closure Observation and Maintenance. The licensee shall observe, monitor, and carry out necessary maintenance and repairs at the disposal site until the site closure is complete and the license is transferred by the Agency in accordance with Section M.16. Responsibility for the disposal site must be maintained by the licensee for five years. A shorter or longer time period for post-closure observation and maintenance may be established and approved as part of the site closure plan, based on site-specific conditions.

Sec. M.16 Transfer of License. Following closure and the period of post-closure observation and maintenance, the licensee may apply for an amendment to transfer the license to the disposal site owner. The license shall be transferred when the Agency finds:

- a. That the closure of the disposal site has been made in conformance with the licensee's disposal site closure plan, as amended and approved as part of the license;
- b. That reasonable assurance has been provided by the licensee that the performance objectives of this Part are met;
- c. That any funds and necessary records for care will be transferred to the disposal site owner;
- d. That the post-closure monitoring program is operational for implementation by the disposal site owner; and
- e. That the Federal or State Agency which will assume responsibility for institutional control of the

disposal site is prepared to assume responsibility and ensure that the institutional requirements found necessary under Paragraph M.11h. will be met.

Sec. M.17 Termination of License

- a. Following any period of institutional control needed to meet the requirements found necessary under Section M.11, the licensee may apply for an amendment to terminate the license.
- b. This application will be reviewed in accordance with the provisions of Section C.24 of these regulations.
- c. A license shall be terminated only when the Agency finds:
 - i. That the institutional control requirements found necessary under Paragraph M.11h. have been met;
 - ii. That any additional requirements resulting from new information developed during the institutional control period have been met; and
 - iii. That permanent monuments or markers warning against intrusion have been installed.

General Performance Objectives

Sec. M.18 General Requirement. Land disposal facilities shall be sited, designed, operated, closed, and controlled after closure so that reasonable assurance exists that exposures to individuals are within the requirements established in the performance objectives in Sections M.19 through M.22.

Sec. M.19 Protection of the General Population from Releases of Radioactivity. Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals shall not result in an annual dose exceeding an equivalent of 25 millirems (0.25 mSv) to the whole body, 75 millirems (0.75 mSv) to the thyroid, and 25 millirems (0.25 mSv) to any other organ of any member of the public. Reasonable effort should be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable.

Sec. M.20 Protection of Individuals from Inadvertent Intrusion. Design, operation, and closure of the land disposal facility shall ensure protection of any individual inadvertently intruding into the disposal site and occupying the site or contacting the waste at any time after active institutional controls over the disposal site are removed.

Sec. M.21 Protection of Individuals During Operations. Operations at the land disposal facility shall be

conducted in compliance with the standards for radiation protection set out in Part D of these regulations, except for releases of radioactivity in effluents from the land disposal facility, which shall be governed by Section M.19. Every reasonable effort should be made to maintain radiation exposures as low as is reasonably achievable.

Sec. M.22 Stability of the Disposal Site After Closure. The disposal facility shall be sited, designed, used, operated, and closed to achieve long-term stability of the disposal site and to eliminate, to the extent practicable, the need for ongoing active maintenance of the disposal site following closure so that only surveillance, monitoring, or minor custodial care are required.

Technical Requirements for Land Disposal Facilities

Sec. M.23 Disposal Site Suitability Requirements for Land Disposal

- a. Disposal Site Suitability for Near-Surface Disposal. The primary emphasis in disposal site suitability is given to isolation of wastes and to disposal site features that ensure that the long-term performance objectives are met.
- i. The disposal site shall be capable of being characterized, modeled, analyzed and monitored.
 - ii. Within the region where the facility is to be located, a disposal site should be selected so that projected population growth and future developments are not likely to affect the ability of the disposal facility to meet the performance objectives of this Part.
 - iii. Areas shall be avoided having known natural resources which, if exploited, would result in failure to meet the performance objectives of this Part.
 - iv. The disposal site shall be generally well drained and free of areas of flooding or frequent ponding. Waste disposal shall not take place in a 100-year flood plain, coastal high-hazard area or wetland, as defined in Executive Order 11988, "Floodplain Management Guidelines".
 - v. Upstream drainage areas shall be minimized to decrease the amount of runoff which could erode or inundate waste disposal units.
 - vi. The disposal site shall provide sufficient depth to the water table that ground water intrusion, perennial or otherwise, into the waste will not occur. The Agency will consider an exception to this requirement to allow disposal below the water table if it can be conclusively shown that disposal site characteristics will result in molecular diffusion being the predominant means of radionuclide movement and the rate of movement will result in the performance objectives being met. In no case will waste disposal be permitted in the zone of fluctuation of the water table.

- vii. The hydrogeologic unit used for disposal shall not discharge ground water to the surface within the disposal site.
- viii. Areas shall be avoided where tectonic processes such as faulting, folding, seismic activity, or vulcanism may occur with such frequency and extent to significantly affect the ability of the disposal site to meet the performance objectives of this Part or may preclude defensible modeling and prediction of long-term impacts.
- ix. Areas shall be avoided where surface geologic processes such as mass wasting, erosion, slumping, landsliding, or weathering occur with such frequency and extent to significantly affect the ability of the disposal site to meet the performance objectives of this Part, or may preclude defensible modeling and prediction of long-term impacts.
- x. The disposal site must not be located where nearby facilities or activities could adversely impact the ability of the site to meet the performance objectives of this Part or significantly mask the environmental monitoring program.

b. Reserved

Sec. M.24 Disposal Site Design for Land Disposal

a. Disposal Site Design for Near-Surface Disposal

- i. Site design features shall be directed toward long-term isolation and avoidance of the need for continuing active maintenance after site closure.
- ii. The disposal site design and operation shall be compatible with the disposal site closure and stabilization plan and lead to disposal site closure that provides reasonable assurance that the performance objectives will be met.
- iii. The disposal site shall be designed to complement and improve, where appropriate, the ability of the disposal site's natural characteristics to assure that the performance objectives will be met.
- iv. Covers shall be designed to minimize to the extent practicable water infiltration, to direct percolating or surface water away from the disposed waste, and to resist degradation by surface geologic processes and biotic activity.
- v. Surface features shall direct surface water drainage away from disposal units at velocities and gradients which will not result in erosion that will require ongoing active maintenance in the future.

- vi. The disposal site shall be designed to minimize to the extent practicable the contact of water with waste during storage, the contact of standing water with waste during disposal, and the contact of percolating or standing water with wastes after disposal.

b. Reserved

Sec. M.25 Land Disposal Facility Operation and Disposal Site Closure

a. Near-Surface Disposal Facility Operation and Disposal Site Closure

- i. Wastes designated as Class A pursuant to Section D.307 of these regulations shall be segregated from other wastes by placing in disposal units which are sufficiently separated from disposal units for the other waste classes so that any interaction between Class A wastes and other wastes will not result in the failure to meet the performance objectives of this Part. This segregation is not necessary for Class A wastes if they meet the stability requirements in Paragraph D.308b. of these regulations.
- ii. Wastes designated as Class C pursuant to Section D.307 of these regulations shall be disposed of so that the top of the waste is a minimum of five meters below the top surface of the cover or must be disposed of with intruder barriers that are designed to protect against an inadvertent intrusion for at least 500 years.
- iii. Except as provided in Subparagraph M.25a.xii., only waste classified as Class A, B, or C shall be acceptable for near-surface disposal. All waste shall be disposed of in accordance with requirements of Subparagraphs M.25a.iv. through xi.
- iv. Wastes shall be emplaced in a manner that maintains the package integrity during emplacement, minimizes the void spaces between packages, and permits the void spaces to be filled.
- v. Void spaces between waste packages shall be filled with earth or other material to reduce future subsidence within the fill.
- vi. Waste shall be placed and covered in a manner that limits the radiation dose rate at the surface of the cover to levels that at a minimum will permit the licensee to comply with all provisions of Section D.105 of these regulations at the time the license is transferred pursuant to Section M.16.
- vii. The boundaries and locations of each disposal unit shall be accurately located and mapped by means of a land survey. Near-surface disposal units shall be marked in such a way that the boundaries of each unit can be easily defined. Three permanent survey marker control points, referenced to United States Geological Survey (USGS) or National Geodetic Survey (NGS) survey control stations, shall be established on the site to facilitate surveys. The USGS or NGS

- control stations shall provide horizontal and vertical controls as checked against USGS or NGS record files.
- viii. A buffer zone of land shall be maintained between any buried waste and the disposal site boundary and beneath the disposed waste. The buffer zone shall be of adequate dimensions to carry out environmental monitoring activities specified in Paragraph M.26c. and take mitigative measures if needed.
 - ix. Closure and stabilization measures as set forth in the approved site closure plan shall be carried out as each disposal unit is filled and covered.
 - x. Active waste disposal operations shall not have an adverse effect on completed closure and stabilization measures.
 - xi. Only wastes containing or contaminated with radioactive material shall be disposed of at the disposal site.
 - xii. Proposals for disposal of waste that is not generally acceptable for near-surface disposal because the waste form and disposal methods must be different and, in general, more stringent than those specified for Class C waste, may be submitted to the Agency for approval.

b. Reserved

Sec. M.26 Environmental Monitoring

- a. At the time a license application is submitted, the applicant shall have conducted a preoperational monitoring program to provide basic environmental data on the disposal site characteristics. The applicant shall obtain information about the ecology, meteorology, climate, hydrology, geology including geophysics and geotechnical engineering, geochemistry, and seismology of the disposal site. For those characteristics that are subject to seasonal variation, data must cover at least a 12-month period.
- b. During the land disposal facility site construction and operation, the licensee shall maintain an environmental monitoring program. Measurements and observations must be made and recorded to provide data to evaluate the potential health and environmental impacts during both the construction and the operation of the facility and to enable the evaluation of long-term effects and the need for mitigative measures. The monitoring system must be capable of providing early warning of releases of waste from the disposal site before they leave the site boundary.
- c. After the disposal site is closed, the licensee responsible for post-operational surveillance of the disposal site shall maintain a monitoring system based on the operating history and the closure and stabilization of the disposal site. The monitoring system must be capable of providing early warning of releases of waste from the disposal site before they leave the site boundary.

- d. The licensee shall have plans for taking corrective measures if the environmental monitoring program detects migration of waste which would indicate that the performance objectives may not be met.

Sec. M.27 Alternative Requirements for Design and Operations. The Agency may, upon request or on its own initiative, authorize provisions other than those set forth in Sections M.24 through M.26 for the segregation and disposal of waste and for the design and operation of a land disposal facility on a specific basis, if it finds reasonable assurance of compliance with the performance objectives of this Part.

Sec. M.28 Institutional Requirements

- a. Land Ownership. Disposal of waste received from other persons may be permitted only on land owned in fee by the Federal or a State government.
- b. Institutional Control. The land owner or custodial agency shall conduct an institutional control program to physically control access to the disposal site following transfer of control of the disposal site from the disposal site operator. The institutional control program shall also include, but not be limited to, conducting an environmental monitoring program at the disposal site, periodic surveillance, minor custodial care, and other requirements as determined by the Agency; and administration of funds to cover the costs for these activities. The period of institutional controls will be determined by the Agency, but institutional controls may not be relied upon for more than 100 years following transfer of control of the disposal site to the owner.

Sec. M.29 Alternative Requirements for Waste Classification and Characteristics. The Agency licensing a low-level disposal facility may, upon request or on its own initiative, authorize other provisions for the classification and characteristics of waste on a specific basis, if, after evaluation of the specific characteristics of the waste, disposal site, method of disposal, it finds reasonable assurance of compliance with the performance objectives specified in this Part.

Financial Assurances

Sec. M.30 Applicant Qualifications and Assurances. Each applicant shall show that it either possesses the necessary funds or has reasonable assurance of obtaining the necessary funds, or by a combination of the two, to cover the estimated costs of conducting all licensed activities over the planned operating life of the project, including costs of construction and disposal.

Sec. M.31 Funding for Disposal Site Closure and Stabilization

- a. The applicant shall provide assurances prior to the commencement of operations that sufficient funds will be available to carry out disposal site closure and stabilization, including: (1) decontamination or dismantlement of land disposal facility structures; and (2) closure and stabilization of the disposal site so that following transfer of the disposal site to the site owner, the need for ongoing active maintenance is

eliminated to the extent practicable and only minor custodial care, surveillance, and monitoring are required. These assurances shall be based on Agency-approved cost estimates reflecting the Agency-approved plan for disposal site closure and stabilization. The applicant's cost estimates must take into account total costs that would be incurred if an independent contractor were hired to perform the closure and stabilization work.

- b. In order to avoid unnecessary duplication and expense, the Agency will accept financial sureties that have been consolidated with earmarked financial or surety arrangements established to meet requirements of Federal or other State agencies [and/or local governmental bodies] for such decontamination, closure, and stabilization. The Agency will accept these arrangements only if they are considered adequate to satisfy the requirements of Section M.31 and that the portion of the surety which covers the closure of the disposal site is clearly identified and committed for use in accomplishing these activities.
- c. The licensee's financial or surety arrangement shall be submitted annually for review by the Agency to assure that sufficient funds will be available for completion of the closure plan.
- d. The amount of the licensee's financial or surety arrangement shall change in accordance with changes in the predicted costs of closure and stabilization. Factors affecting closure and stabilization cost estimates include inflation, increases in the amount of disturbed land, changes in engineering plans, closure and stabilization that has already been accomplished, and any other conditions affecting costs. The financial or surety arrangement shall be sufficient at all times to cover the costs of closure and stabilization of the disposal units that are expected to be used before the next license renewal.
- e. The financial or surety arrangement shall be either open-ended or be written for a specified period of time and shall be automatically renewed unless the person who issues the surety notifies the Agency, the beneficiary (the site owner), and the principal (the licensee) not less than 90 days prior to the renewal date of its intention not to renew. In such a situation, the licensee must submit a replacement surety within 30 days after notification of cancellation. If the licensee fails to provide a replacement surety acceptable to the Agency, the beneficiary may collect on the original surety.
- f. Proof of forfeiture shall not be necessary to collect the surety so that, in the event that the licensee could not provide an acceptable replacement surety within the required time, the surety shall be automatically collected prior to its expiration. The conditions described above shall be clearly stated on any surety instrument.
- g. Financial or surety arrangements generally acceptable to the Agency include surety bonds, cash deposits, certificates of deposit, deposits of government securities, escrow accounts, irrevocable letters or lines of credit, trust funds, and combinations of the above or such other types of arrangements as may be approved by the Agency. Self-insurance, or any arrangement which essentially constitutes self-insurance, will not satisfy the surety requirement for private sector applicants.

- h. The licensee's financial or surety arrangement shall remain in effect until the closure and stabilization program has been completed and approved by the Agency, and the license has been transferred to the site owner.

Sec. M.32 Financial Assurances for Institutional Controls

- a. Prior to the issuance of the license, the applicant shall provide for Agency approval, a binding arrangement, between the applicant and the disposal site owner that ensures that sufficient funds will be available to cover the costs of monitoring and any required maintenance during the institutional control period. The binding arrangement shall be reviewed periodically by the Agency to ensure that changes in inflation, technology, and disposal facility operations are reflected in the arrangements.
- b. Subsequent changes to the binding arrangement specified in Paragraph M.32a. relevant to institutional control shall be submitted to the Agency for prior approval.

Records, Reports, Tests, and Inspections

Sec. M.33 Maintenance of Records, Reports, and Transfers

- a. Each licensee shall maintain any records and make any reports in connection with the licensed activities as may be required by the conditions of the license or by the rules, regulations, and orders of the Agency.
- b. Records which are required by these regulations or by license conditions shall be maintained for a period specified by the appropriate regulations or by license condition. If a retention period is not otherwise specified, these records must be maintained and transferred to the officials specified in Paragraph M.33d. as a condition of license termination unless the Agency otherwise authorizes their disposition.
- c. Records which shall be maintained pursuant to this Part may be the original or a reproduced copy or microfilm if this reproduced copy or microfilm is capable of producing copy that is clear and legible at the end of the required retention period.
- d. Notwithstanding Paragraphs M.33a. through c., copies of records of the location and the quantity of wastes contained in the disposal site must be transferred upon license termination to the chief executive of the nearest municipality, the chief executive of the county in which the facility is located, the county zoning board or land development and planning Agency, the State governor, and other State, local and Federal governmental agencies as designated by the Agency at the time of license termination.
- e. Following receipt and acceptance of a shipment of waste, the licensee shall record the date of disposal of the waste, the location in the disposal site, the condition of the waste packages as received, any

discrepancies between materials listed on the manifest and those received, and any evidence of leaking or damaged packages or radiation or contamination levels in excess of limits specified in U.S. Department of Transportation and Agency regulations. The licensee shall briefly describe any repackaging operations of any of the waste packages included in the shipment, plus any other information required by the Agency as a license condition.

- f. Each licensee authorized to dispose of waste received from other persons shall file a copy of its financial report or a certified financial statement annually with the Agency in order to update the information base for determining financial qualifications.
- g.
 - i. Each licensee authorized to dispose of waste received from other persons, pursuant to this Part, shall submit annual reports to the Agency. Reports shall be submitted by the end of the first calendar quarter of each year for the preceding year.
 - ii. The reports shall include:
 - (1) specification of the quantity of each of the principal contaminants released to unrestricted areas in liquid and in airborne effluents during the preceding year,
 - (2) the results of the environmental monitoring program,
 - (3) a summary of licensee disposal unit survey and maintenance activities,
 - (4) a summary, by waste class, of activities and quantities of radionuclides disposed of,
 - (5) any instances in which observed site characteristics were significantly different from those described in the application for a license, and
 - (6) any other information the Agency may require.
 - iii. If the quantities of waste released during the reporting period, monitoring results, or maintenance performed are significantly different from those predicted, the report must cover this specifically.

Sec. M.34 Tests on Land Disposal Facilities. Each licensee shall perform, or permit the Agency to perform, any tests the Agency deems appropriate or necessary for the administration of the regulations in this Part, including, but not limited to, tests of:

- a. Wastes;
- b. Facilities used for the receipt, storage, treatment, handling or disposal of wastes;

- c. Radiation detection and monitoring instruments;
- d. Other equipment and devices used in connection with the receipt, possession, handling, treatment, storage, or disposal of waste; or
- e. Environmental sampling or testing.

Sec. M.35 Agency Inspections of Land Disposal Facilities

- a. Each licensee shall afford to the Agency at all reasonable times opportunity to inspect waste not yet disposed of, and the premises, equipment, operations, and facilities in which wastes are received, possessed, handled, treated, stored, or disposed of.
- b. Each licensee shall make available to the Agency for inspection, upon reasonable notice, records kept by it pursuant to these regulations. Authorized representatives of the Agency may copy and take away copies of, for the Agency's use, any record required to be kept pursuant to these regulations.