

RULES AND REGULATIONS

PERTAINING TO SOLID AND HAZARDOUS WASTES

PART 2

REQUIREMENTS FOR SITING OF HAZARDOUS WASTE DISPOSAL SITES

- 2.1 Scope and Availability. These regulations shall be applicable to the location, design, and design performance of any hazardous waste disposal site which is in operation or proposed to be operated after July 1, 1981.
- 2.2 Definitions. The following definitions, are used in these regulations, shall apply when used unless the context otherwise requires:
- a) "Adverse effect" means a human exposure that exceeds public health protection standards or that can be shown to produce effects on health contrary to a person's welfare, degradation of an environmental medium in excess of quality standards, or significant deterioration of vegetation, crops, or wildlife so as to endanger their viability or normal use.
 - b) "Aquifer" means any geologic formation, group of formations, or portion of a formation capable of yielding significant and useable quantities of groundwater to wells and springs.
 - c) "Board" means the state board of health created by 25-1-103, C.R.S. 1973, as amended.
 - d) "Department" means the Colorado Department of Health created by 25-1-102, C.R.S 1973, as amended.
 - e) "Disposal site" means all contiguous land, including publicly-owned land, used for hazardous waste disposal under common ownership.
 - f) "Domestic sewage" means untreated sanitary wastes that pass through a sewer system.
 - g) "Existing hazardous waste disposal site" means a hazardous waste disposal site which is in active operation prior to July 1, 1981.
 - h) "Federal act" means the federal "Solid Waste Disposal Act", as amended by the Federal "Resource Conservation and Recovery Act of 1976", and as from time to time amended (42 U.S.C. 6901 et seq.).

- i) "Governmental unit" means the State of Colorado, every county, city and county, municipality, school district, special district, and authority located in this state, every public body corporate created or established under the Constitution or any law of this state, and every board, commission, department, institution, or agency of any of the foregoing or of the United States.

- J) "Hazardous waste" means any material, alone or mixed with other materials, which has no commercial use or value, or which is discarded or is to be discarded by the possessor thereof, either of which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or to the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. The term does not include: (i) solid or dissolved material in discharges which are point sources subject to permits under section 402 of the "Federal Water Pollution Control Act", as amended; (ii) source, special nuclear, or byproduct material as defined by the federal "Atomic Energy Act of 1954", as amended; (iii) agricultural waste from the raising of crops or animals, including animal manure, which are returned to the soil as fertilizers or soil conditioners; (iv) solid or dissolved material in domestic sewage; (v) irrigation return flows; (vi) inert materials deposited for construction fill or topsoil placement in connection with actual or contemplated construction at such location or for changes in land contour for agricultural and mining purposes if such depositing does not fall within the definition of treatment, storage or disposal of hazardous waste; or (vii) any waste or other materials exempted or otherwise not regulated as a hazardous waste under the federal act.

- k) "Hazardous waste disposal" means any final action to abandon, deposit, inter or otherwise discard hazardous waste after its use has been achieved or a use is no longer intended or the discharging of hazardous waste into the environment. The term includes the off-site surface impoundment of hazardous waste such as a holding, storage, settling or aeration pit, pond or easoon, except as provided in the following sentence or in Section 25-15-201(4), C.R.S. The term does not include: (i) recycling, reclaiming, incineration, processing, or other treatment of hazardous waste (for the purposes of this subparagraph, the surface impoundment which is part of a sewage treatment works on feedlot operation shall be considered as treatment and not disposal, any recycling, reclaiming, incineration, processing, or treatment facility shall be subject to all local land use regulations); (ii) the beneficial use, including use for fertilizer, soil conditioner, fuel or livestock feed, of sludge

from wastewater treatment plants if such sludge meets all applicable of the Department.

- l) "Hazardous waste disposal site" means contiguous land, including publicly-owned land, under common ownership which is used for hazardous waste disposal.
- m) "Incompatible wastes" means a waste unsuitable for commingling with another waste or material if the commingling might result in:
 - (i) generation of extreme heat or pressure; (ii) fire; (iii) explosive or violent reaction; (iv) formation of substance which are shock-sensitive, friction-sensitive, or which otherwise have the potential of reacting violently; (v) the formation of toxic dusts, mists, fumes or gases or toher chemical; (vi) volatilization of ignitable or toxic chemicals due to heat generation in such a manner that the likelihood of contamination of groundwater or escape of the substances into the environment is increased; or (vii) any other similar reaction.
- n) "Inert material" means non-watersoluble and nondecomposable inert solids together with such minor amounts and types of other materials as will not significantly affect the inert nature of such solids according to rules and regulations of the board. The term includes but is not limited to earth, sand, gravel, rock, concrete which has been in a hardened state for at least sixty days, masonry, asphalt paving fragments, and other non-watersoluble and nondecomposable inert solids including those the board may identify by regulation.
- o) "Landfill" means a natural depression or artificial excavation or other arrangement where wastes are placed in or on land to confine waste materials therein in a manner that constitutes disposal. For the purpose of this Part 2, closed or inactive on-site waste piles and on-site surface impoundments are not considered to be landfills.
- p) "Land treatment facilities" means locations and sites where hazardous wastes are applied onto the land and/or incorporated into the surface soil for the purpose of biological reduction and/or soil attenuation in such a manner as to constitute hazardous waste disposal.
- q) "Leachate" means liquid that has or may be percolated through or drained from a solid or hazardous waste landfill or surface impoundment which contains soluble, partially soluble, or miscible components removed from such waste contained therein.
- r) "Location" The area described in the legal definition of the property contained in application for a Certificate of Designation to the Board of County Commissioners of a county or to the

governing body of a municipality in which a hazardous waste disposal site is proposed.

- s) "Long-term", when used in connection with hazardous waste disposal means a period of time after operations and post closure activities are completed during which consideration of the chemical and physical state, the persistence, and any potential removal of hazardous waste from its disposal location are of concern relative to public health and environmental protection.
- t) "Manifest" means the document used for identifying the quantity, composition, origin, routing, and designation of hazardous waste during its transportation from the point of generation to the point of storage, treatment, or disposal.
- u) "On-site hazardous waste disposal site" means a site excluded from a requirement to obtain a certificate of designation from the applicable local government by Section 25-115-201 (4) and (5) of the State Act for disposal of one's own waste or of a mining waste.
- v) "Operator" means the person operating a hazardous waste disposal site either by contract or permit.
- w) "Person" means any individual, public or private corporation, partnership, association, firm, trust or estate; the state or any executive department, institution, or agency thereof; any municipal corporation, county, city and county, or other political subdivision of the state; or any other legal entity whatsoever which is recognized by law as the subject of rights and duties.
- x) "Publicly-owned land" means any land owned by the federal government or any agency thereof or land owned by the state or any agency or political subdivision thereof.
- y) "State Act", when used in connection with hazardous waste, means the provisions of Article 15 of Title 25 of the Colorado Revised Statutes, as amended.
- z) "Substantial change in ownership, design or operation" means any redesign or planned construction which would significantly negate the planned design performance of a hazardous waste disposal site as originally designated; an increase in waste quantities to be disposed in excess of 10% of the total lifetime disposal capacity that was originally designated; the addition of category of wastes more hazardous than those originally planned to be received; the planned construction of a new facility, disposal cell, or other waste handling process that has not been previously reviewed and accepted as complying with these regulations; or the selling or

transferring of the site or the certificate or designation to a new owner or operator.

AA) "Surface impoundment" means any natural depression, artificial excavation or dike arrangement, including a pit, pond, or lagoon, to be used or operated in such a manner that it may directly or indirectly result in the disposal of hazardous waste or long-term containment of hazardous wastes so as to constitute disposal.

2.3 Application Requirements for Certificates of Designation

2.3.1 Any person who proposes to operate a hazardous waste disposal site shall, unless specifically exempted by Section 25-15-201 of the State Act, make application for a certificate of designation to the board of county commissioners of the county or to the governing body of the municipality in which such site is proposed to be located.

2.3.2 The application for a hazardous waste disposal site shall set forth the names of the applicant and the owner of the site, the names or titles of the persons in charge of the site, the legal description of the property, the location of the site, the types of wastes to be accepted or rejected, the types of disposal, the hours of operation, the anticipated access routes in the county in which the site is to be located, the method of supervision, and the rates to be charged for the various wastes to be received.

2.3.3 An application for a hazardous waste disposal site shall be accompanied by an engineering design report which details the proposed location, the proposed design, the design performance, and any operational or maintenance procedures that may be necessary to achieving the design performance for the site.

2.3.4 The engineering design report and any amendments thereto shall demonstrate that the site can achieve a design performance that will comply with all applicable criteria specified in rules and regulations established by the Board, the Water Quality Control Commission, the Air Quality Control Commission, and any conditions required in a Certificate of Designation pursuant to Section 25-15-204 of the State Act.

2.3.5 The design report shall provide adequate information necessary for the Department to ascertain whether the proposed site design and method of construction would comply with the minimum design performance criteria set forth in Section 2.4 of these regulations and would comply with the location and design requirements contained in Section 2.5 of these regulations.

2.3.6 Any substantial change in ownership, design, or operation pursuant to Section 25-15-206 of the State Act which is referred to by a local government for a finding of fact by the Department as to whether such change complies with these regulations shall be accompanied by a design report which contains information necessary for determining whether such change would comply with

the minimum design performance criteria set forth in Section 2.4 of these regulations and any applicable location and design requirements contained in Section 2.5 of these regulations.

2.3.7 Technical guidelines, including specific technical factors and their use, which are developed and issued by the Department for use by applicants, local governments, and the public shall be used in determining whether hazardous waste disposal sites satisfy the design performance criteria set forth in Section 2.4 of these regulations.

2.3.8 Procedural guidelines developed and issued by the Department for use by applicants, local governments, and the public shall be followed in making and issuing findings of fact on whether hazardous waste disposal sites satisfy these regulations, including those guidelines on which State agencies are to be involved in the review, the means by which materials received for the record are made available for public review, and methods of obtaining public inputs through public meetings and other means on matters within the Department's Jurisdiction involving interrogatories to the applicant and the final record upon which the Department bases its finding of fact.

2.4 Minimum Design Performance Criteria for Off-Site Hazardous Waste Disposal Sites and On-Site Hazardous Waste Landfills.

2.4.1 Sites intended for use as landfills, surface impoundments and land treatment facilities subject to these regulations shall be located and designed in manner that the design performance will assure long-term protection of human health and the environment.

2.4.2 Hazardous waste disposal sites shall be designed to prevent adverse effects on groundwater quality, considering:

- a) The volume and physical and chemical characteristics of the waste in the facility, including its potential for migration through any liners provided in the design and the surrounding soils or bedrock strata;
- b) The hydrogeological characteristics of the facility and the surrounding land and other site specific factors which are basic to preventing adverse effects on groundwater quality;
- c) The quantity, quality, and directions of flow of groundwater;
- d) The proximity of existing and planned groundwater users and the withdrawal rates of such uses;
- e) The existing quality of groundwater, including other sources of contamination and their cumulative impact on the groundwater;

- f) The potential for health risks caused by human exposure to waste constituents;
- g) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and
- h) The persistence and permanence of the potential adverse effects.

2.4.3 Hazardous waste disposal sites shall be designed to prevent adverse effects on surface water quality, considering:

- a) The volume and physical and chemical characteristics of the waste in the facility;
- b) The hydrogeological characteristics of the facility and surrounding land and other site specific factors which are basic to preventing adverse effects on surface water quality, including the topography of the area around the facility and any engineering features to influence surface water flow patterns that may be appropriate;
- c) The quantity, quality, and directions of flow of surface water;
- d) The patterns of precipitation in the region and potential impacts on disposal locations, including removal of wastes;
- e) The proximity of the facility to surface waters;
- f) The existing and planned uses of nearby surface waters and any water quality standards established for those surface waters;
- g) The existing quality of surface water, including other sources of contamination and their cumulative impact on surface water;
- h) The potential for health risks caused by human exposure to waste constituents;
- i) The potential damage to wildlife, crops, vegetation and physical structures caused by exposure to waste constituents; and
- j) The persistence and permanence of the potential adverse effects.

2.4.4 Hazardous waste disposal sites shall be designed to prevent adverse effects on air quality, considering:

- a) The volume and physical and chemical characteristics of the waste in the facility, including its potential for volatilization and wind dispersal;

- b) The existing quality of the air, including other sources of contamination and their cumulative impact on air quality;
- c) The potential for health risks caused by human exposure to waste constituents;
- d) The prevailing wind patterns in the region and other site specific factors that may influence or cause adverse effects on air quality;
- e) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and
- f) The persistence and permanence of the potential adverse effects.

2.4.5 Hazardous waste disposal sites shall be designed to prevent long term adverse effects on public health and the environment due to migration of waste constituents in the surface and subsurface environment, considering:

- a) The volume and physical and chemical characteristics of the waste in the facility, including its potential for migration through soil;
- b) The geologic characteristics of the facility and surrounding land and other site specific factors that may effect the potential for migration of waste constituents into surface and subsurface physical structures;
- c) The potential for migration of waste constituents into the root zone of food-chain and other vegetation;
- d) The potential for health risks caused by human exposure to waste constituents;
- e) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and
- f) The persistence and permanence of the potential adverse effects.

2.4.6 The function and physical integrity of any liner emplaced in hazardous waste disposal sites to accomplish the design performance of the site shall be protected.

2.4.7 Any leachate and runoff control system shall be designed with sufficient capacity such that the design performance will comply with paragraphs 2.4.1, 2.4.2, 2.4.3, 2.4.4 and 2.4.5 of these regulations, considering:

- a) The volume and types of leachate or contaminated runoff produced at the facility;

- b) The climatic and hydrogeological conditions of the area; and
- c) The available alternatives for managing any leachate or contaminated runoff produced.

2.4.8. The design of a hazardous waste disposal site and facility shall include a method for closure that will provide reasonable assurance of long-term compliance with paragraphs 2.4.1, 2.4.2, 2.4.4, 2.4.5, and 2.4.7 of these regulations, considering:

- a) The types and amounts of waste in the facility, including the amount of free liquids;
- b) The mobility and expected rates of migration of emplaced wastes;
- c) The site location, topography, and surrounding land use;
- d) Climatic conditions in the area;
- e) The thickness, porosity and permeability of the cover proposed to be used, the slope and length of run of the slope, the final surface contours of the completed cover, and the types and durability of vegetation proposed to be placed on the cover;
- f) Geological and soil profiles and the surface and subsurface hydrology of the site; and
- g) The maintenance of any post-closure groundwater monitoring system and any leachate and runoff control system.

2.4.9 The design of a hazardous waste landfill, surface impoundment, or land treatment facility shall include systems for monitoring groundwater, surface water, and providing quality control of materials in construction. Such systems shall be sufficient to demonstrate via professionally accepted methods (e.g. those of the American Society of Testing Materials) that the design performance requirements of these regulations are satisfied.

2.4.10 The design of a hazardous waste disposal landfill, surface impoundment, or land treatment facility shall include procedures to be followed during construction, including supervision and certification by a professional geologist or professional engineer, to demonstrate that the facility is constructed in accordance with the design as approved.

2.5 Requirements for Siting and Design of Off-Site Hazardous Waste Disposal Sites and On-Site Hazardous Waste Landfills.

2.5.1 The siting and design of each site for disposal of hazardous waste shall demonstrate that the minimum design performance criteria contained in Section 2.4 of these regulations will be satisfied after site construction and implementation of the proposed design.

2.5.2 The proposed design, and design performance of a hazardous waste disposal site shall satisfy or satisfactorily mitigate the following conditions:

- a) Under normal climatic conditions odor-threshold concentration levels established in State air pollution regulations will not be exceeded;
- b) Proposed access routes shall be reasonably safe based on minimizing public exposure to transportation incidents, and a finding that such routes can be shown to meet or exceed classification standards for State roads;
- c) Adequate fire protection is provided on a 24-hour day basis by an organized fire department or equivalent such service is provided by the owner/operator of the site;
- d) Adequate security to provided for the site and its operations on a 24-hour daily basis by security personnel and/or adequate security barriers to the site and its operations;
- e) The proper materials will be available in adequate supply for constructing liners of disposal cells and for providing a compacted impermeable cover to prevent any seepage into the completed fill upon closure; and
- f) Adequate professional competence and resources exist to design and construct the site, to operate the site for its approved period of operation, and to provide for closure and post-closure care to guarantee long-term protection of public health and the environment.

2.5.3 The geological and hydrological conditions of a site in which hazardous wastes are to be disposed shall be such that reasonable assurance is provided that such wastes are isolated within the designated disposal area of the site and away from natural environmental pathways that could expose the public for 1,000 years, or some demonstrated shorter period in which the wastes are transformed to an innocuous condition. Such assurance is to be based on the following considerations:

- a) Geomorphic conditions either will not vary significantly from the present state or will occur to a predictable degree which can be accommodated in the facility design;

- b) The immediate area of the site is in strata of minimal groundwater flow;
- c) The geologic strata surrounding the site combined with engineered barriers included in the design shall provide a minimum permeability of 10^{-7} cm/sec or equivalent of sufficient thickness between the disposal location and the nearest domestically or agriculturally useable aquifer to isolate any materials to be disposed therein;
- d) The juxtaposition of the site and any free flowing or standing natural surface waters shall be such that disposal locations will not impact nor be impacted by such surface waters;
- e) The terrain is such that good drainage exists for movement of precipitation away from the disposal area, and such that water and wind erosion will be minimal; and
- f) The geochemical characteristics of the geologic strata at the site are compatible with the waste categories proposed to be disposed at the site especially in terms of providing high adsorption, absorption, or chemical fixation of any wastes that may migrate from the immediate areas where disposed.

2.5.4 The design of a hazardous waste disposal site shall, unless it is demonstrated to be unnecessary, include a liner the performance of which will comply with paragraphs 2.4.1, 2.4.2, 2.4.3, and 2.4.5 of these regulations, considering:

- a) The physical and chemical characteristics of the waste in the facility, including any treatment of wastes to promote the immobilization of hazardous substances;
- b) The pressure head of leachate on the liner under worst case conditions;
- c) The permeability of the liner material at specified compaction density and moisture content where earthen materials are used;
- d) The potential chemical reactions between the wastes and the liner material that could affect the integrity of the liner;
- e) The physical and chemical properties of the soil underlying the facility that supports any emplaced liner; and
- f) The potential for damage to the liner system that could occur during installation or planned use.

2.5.5 The design of each hazardous waste disposal site shall include a leachate and runoff control system which will provide compliance with Section 2.4 of these regulations, considering:

- a) The physical and chemical characteristics of the waste in the facility;
- b) Climatic conditions in the area, including precipitation events;
- c) The volume of leachate or contaminated runoff that could be produced at the facility; and
- d) The available options for managing any leachate or contaminated runoff that is collected at the facility.

2.5.6 The location of any facility for disposal or preparation for disposal of hazardous wastes shall be within a distance controlled by the owner/operator by an acceptable means to prevent adverse effects on the public health should unexpected discharges of hazardous waste occur.

2.6 Minimum Design Performance Criteria for On-Site Surface Impoundments and Waste Piles

(RESERVED)

2.7 Requirements for Siting and Design of On-Site Surface Impoundments and Waste Piles

(RESERVED)

2.8 Violations and Penalties

Any person who violates any provision of these regulations shall be subject to the penalties as set forth in the State Act.

2.9 Basis and Purpose

A written concise general statement of the basis and purpose of these regulations, including a scientific and technological rationale and justification, has been prepared and adopted by the Board of Health, and is hereby incorporated in these regulations by reference pursuant to 24-4-103, C.R.S. 1973, as amended.