DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DIVISION OF AIR AND WASTE MANAGEMENT

Statutory Authority: 7 aware Code, Chapters 60 and 63 (7 **Del.C.** Chs. 60 and 63)
7 **DE Admin. Code** 1301

PROPOSED

REGISTER NOTICE
SAN # 2004-05

1. TITLE OF THE REGULATIONS:
Delaware Regulations Governing Solid Waste (DRGSW)

2. BRIEF SYNOPSIS OF THE SUBJECT, SUBSTANCE AND ISSUES:
There are five amendments to update and enhance various sections of the solid waste regulations. The first amendment regarding Permits has three changes to clarify language, define requirements for permit transfers, and to make environmental assessment application requirements consistent. The second and third amendments regarding Sanitary and Industrial Landfills clarifies a reference to an Engineering Report. The fourth amendment regarding to Environmental Covenants updates language to comply with changes to the Delaware Code. The fifth amendment regarding Infectious Waste has eighteen changes that clarify and reorganize the entire Section. These five amendments will help improve understanding and implementation of the solid waste requirements.

3. POSSIBLE TERMS OF THE AGENCY ACTION:
NONE

4. STATUTORY BASIS OR LEGAL AUTHORITY TO ACT:
Amendments to DRGSW are proposed and amended in accordance with the provisions found at 7 Delaware Code, Chapter 60.

5. OTHER REGULATIONS THAT MAY BE AFFECTED BY THE PROPOSAL:
NONE

6. NOTICE OF PUBLIC COMMENT:
The public hearing on the proposed amendments to DRGSW will be held on Monday October 22, 2007 starting at 6:30 p.m. in the Richardson and Robbins Auditorium, 89 Kings Highway, Dover, DE.

7. PREPARED BY:
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1301 Regulations Governing Solid Waste

(Break in Continuity of Sections)(Go to Section 4.0)

1.0 Declaration Of Intent
The Delaware Department of Natural Resources and Environmental Control finds and declares that improper solid waste handling and disposal practices may result in environmental damage, including substantial degradation of the surface and ground water and waste of valuable land and other resources, and may constitute a continuing hazard to the health and welfare of the people of the State. The Department further finds that the

utilization of solid waste handling and disposal facilities which are properly located, designed, operated, and monitored will minimize environmental damage and protect public health and welfare.

It is the intent of the Department to require that solid waste handling and disposal be conducted in a manner and under conditions which will eliminate the dangerous and deleterious effects of improper solid waste handling and disposal upon the environment and upon human health, safety, and welfare.

The purposes of these regulations are:

1. To encourage, in all appropriate ways, recycling, reuse, and reclamation processes, and
2. To implement the provisions of 7 **Del.C.** Ch. 60, which directs the Department to put into effect a program for improved solid waste storage, collection, transportation, processing, transfer, and disposal by providing that such activities may henceforth be conducted only in an environmentally acceptable manner pursuant to a permit obtained from the Department.

2.0 Scope And Applicability

2.1 Authority

2.1.1 These regulations are enacted pursuant to 7 **Del.C.** Ch. 60.

2.1.2 These regulations shall be known as "Regulations Governing Solid Waste" and shall repeal the "Delaware Solid Waste Disposal Regulation".

2.2 Applicability

2.2.1 These regulations apply to any person using land or allowing the use of land for the purposes of storage, collection, processing, transfer, or disposal of solid waste; and to any person transporting solid waste in or through the State of Delaware. The following shall be subject to the provisions of these regulations:

2.2.1.1 Sanitary landfills
2.2.1.2 Industrial landfills
2.2.1.3 Resource recovery facilities
2.2.1.4 Transfer stations
2.2.1.5 Special wastes handling
2.2.1.6 Transportation of solid waste
2.2.1.7 Storage of solid waste

2.2.2 These regulations do not apply to those agricultural wastes that are subject to regulations promulgated by the Division of Water Resources.

2.2.3 For the purposes of these regulations, all wastes defined herein and that are subject to regulations promulgated by the Division of Water Resources shall not be regulated as solid wastes.

2.2.4 These regulations do not apply to any waste which meets the criteria of hazardous waste as described in the Delaware Regulations Governing Hazardous Waste.

2.3 Exemptions

The following activities are exempted from these regulations:

2.3.1 Disposal or land application on a farm of the agricultural wastes that are generated on the farm or result from the operation of the farm. The disposal or land application must be conducted in a manner that is in compliance with all federal, state, and local regulatory requirements and that does not threaten human health or the environment.

2.3.2 Composting, on a private property, the leaves, grass clippings, and other vegetation originating on the property.

2.3.3 Disposal of clean fill.

2.3.4 Creation of brush piles on the property on which the material was generated.

2.3.5 The use of vegetative matter and untreated ground wood products to construct berms on the property on which the materials were generated. (Notification must be made to the Department prior to commencing this activity.)

2.4 Compliance

2.4.1 Existing facilities

All existing facilities must comply with the provisions of these regulations with the following exceptions:

2.4.1.1 Closed facilities or closed portions of facilities will not be required to disturb or replace their cap or cover system for the purpose of coming into compliance with these regulations.

2.4.1.2 Facilities currently operating under a permit which does not require a liner and/or a leachate detection system will not be required to install a liner or leachate detection system in closed or currently active areas for the purpose of coming into compliance with these regulations.

2.4.2 New facilities and expansions of existing facilities

All new facilities and all expansions of existing facilities shall comply with the provisions of these regulations.

2.5 Composting And Recycling Approvals

2.5.1 Composting Approvals

Other than individual household composting, all other composting operations must obtain written approval from the Department prior to commencing a composting operation. To obtain an approval, a person must submit the following information to the Department:

2.5.1.1 A written plan of operation demonstrating to the Department that the requestor of the approval and the person responsible for operating the composting facility understand and will apply the principles and proper methods of composting. The plan of operation must also demonstrate that the composting facility will be operated in a manner that will not pose a threat to human health and the environment; and

2.5.1.2 A written statement explaining how the applicant intends to use the compost.

2.5.2 Recycling Approvals

Recycling solid waste into specific market applications requires written approval prior to commencing this activity. To obtain an approval, a person must submit the following information to the Department:

2.5.2.1 A written plan of operation describing the types and quantities of materials that will be accepted at the facility, the processing methods and equipment that will be used, and the products that will be produced, and

2.5.2.2 Documentation demonstrating the existence of a market or markets for the product(s).

2.6 Other Applicable Requirements. Nothing in these regulations shall be construed as relieving an owner or operator of a facility from the obligation of complying with any other laws, regulations, orders, or requirements which may be applicable.

3.0 Definitions

The following words, phrases, and terms as used in these regulations have the meanings given below:

“**100 Year Flood**” means a flood that has a one percent or greater chance of recurring in any given year or a flood of a magnitude equaled or exceeded once in 100 years on the average over a significantly long period.

"**Action Leakage Rate**" means the quantity of liquid collected from a leak detection system of a double liner system over a specified period of time which, when exceeded, requires certain actions to be taken as described in the Action Leakage Rate response plan approved by the Department.

"**Active Life**" means the period of operation beginning with the initial receipt of solid waste and ending at the completion of closure activities.

"**Active Portion**" means that portion of a facility that presently has an operating permit issued by the Department of Natural Resources and Environmental Control.

"**Agricultural Waste**" means carcasses of poultry or livestock, crop residue, or animal excrement.

"**Aquifer**" means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells, springs or surface water.

"**ASTM**" means the American Society for Testing and Materials.

"**Authorized Representative**" means the person responsible for the overall operation of a facility or an operational unit (i.e., part of a facility), e.g., the plant manager, landfill manager, superintendent, or person of equivalent responsibility.

"**Bottom Ash**" means the residue remaining in the bottom of the combustion chamber of an incinerator after the combustion of fuel or waste.

"**Buffer Zone**" means those onsite areas adjacent to the facility property line which shall be left undeveloped during the active life as well as the inactive life of the facility.

"**Bulky Waste**" means items whose large size or weight precludes or complicates their handling by normal collection, processing, or disposal methods.

"**Cap" or "Capping System**" means the material used to cover the top and sides of a sanitary or industrial landfill when fill operations cease.

"**Cell**" means a discrete engineered area that is designed for the disposal of solid waste and that is a subpart of a landfill.

"**Certification**" means a statement of professional opinion based upon knowledge and belief.

"**CFR**" means the Code of Federal Regulations.

"**Clay**", as a soil separate, means the mineral soil particles less than 0.002 mm in diameter. As a soil textured class, "CLAY" means soil material that is 40% or more clay, less than 45% sand, and less than 40% silt. Clay used as a liner or cap should be classifiable as a CL or CH (Unified Soil Classification System) with a liquid limit between 30 and 60, should place above the A-line on the plasticity chart, and should have a minimum plastic index of 15. A clay liner should have a cation exchange capacity greater than 15 meq/100 grams and be in the neutral pH range.

"**Clean Fill**" means a non-water-soluble, non-decomposable, environmentally inert solid such as rock, soil, gravel, concrete, broken glass, and/or clay or ceramic products.

"**Closed Portion**" means that portion of a facility which an owner or operator has closed in accordance with the approved facility closure plan and all other applicable closure requirements.

“**Closure**" means the cessation of operation of a facility or a portion thereof and the act of securing such a facility so that it will pose no significant threat to human health or the environment.

"**Closure Plan**" means written reports and engineering plans detailing those actions that will be taken by the owner or operator of a facility to effect proper closure of that facility or a portion thereof.

"**Commercial Waste**" means solid waste generated by stores, offices, restaurants, warehouses, and other non-manufacturing, non-processing activities.

"**Compost**" means a product of composting that has been stabilized to a humus-like product, is free of pathogens at an infectious level and of viable plant seeds, that does not attract insects or vectors, can be handled and stored without nuisance, and is beneficial to the growth of plants.

"**Composting**" means the biological decomposition and stabilization of organic material, under conditions that allow development of thermophilic temperatures as a result of biologically produced heat, to produce a final product that is stable, free of pathogens and viable plant seeds, and can be beneficially applied to the land.

"**Composting Facility**" means a facility where organic material is processed using composting technology which may include but is not limited to physical turning, windrowing, in vessel composting, or other mechanical handling of organic material.

"**Confined Aquifer**" means an aquifer containing ground water which is everywhere at a pressure greater than atmospheric pressure and from which water in a well will rise to a level above the top of the aquifer. A confined aquifer is overlain by material of distinctly lower permeability ("confining bed") than the aquifer.

"**Contaminant**" means any substance that enters the environment at a concentration that has the potential to endanger human health or degrade the environment.

"**Controlling Slopes**" means slopes on those areas of a liner that have a direct influence on the maximum leachate head, or slopes that are perpendicular to the collection laterals.

"**Daily Cover**" means a layer of compacted earth, or other suitable material as approved by the Department, used to enclose a volume of solid waste each working day.

"**Department**" means The Department of Natural Resources and Environmental Control.

"**Dike**" means an embankment or ridge of either natural or man-made materials used to prevent or to control the movement of solids, liquids, or other materials.

"**Discharge**" means the accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of a substance into or onto any land, water, or air.

"**Disposal**" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste into or upon any land or water.

"**Disposal Facility**" means any facility or portion of a facility at which solid waste is intended to be and/or is intentionally placed into or onto any land and at which solid waste will remain after closure has taken place.

"**Double Liner System**" means a liner system consisting of two liners with a leachate detection and collection system in between.

"**Dry Waste**" (formerly called "Inert Solid Waste") means wastes including, but not limited to, plastics, rubber, lumber, trees, stumps, vegetative matter, asphalt pavement, asphaltic products incidental to construction/ demolition debris, or other materials which have reduced potential for environmental degradation and leachate production.

"**Environmental Assessment**" means a detailed and comprehensive description of the condition of all environmental parameters as they exist at and around the site of a proposed action prior to implementation of the proposed action. This description is used as a baseline for assessing the environmental impacts of a proposed action.

"**Environmentally Unsound**" means characterized by any condition, resulting from the methods of operation or design of a facility, which impairs the quality of the environment when compared to the surrounding background environment or any appropriate promulgated federal, state, county or municipal standard.

"**Existing Facility**" means a facility which was in operation or for which construction had commenced on or before the date of enactment of these regulations, provided that the facility was being constructed or operated pursuant to all permits and/or approvals required by the Department at the time of enactment. A facility has commenced construction if either:

(i) an onsite physical construction program has begun and is moving toward completion within a reasonable time; or

(ii) the owner or operator has entered into contractual obligations which cannot be cancelled or modified without substantial loss for physical construction to be completed within a reasonable time.

"**Expansion**" means the process of increasing the areal dimensions, vertical elevations, or slopes beyond the original approved limits of the facility.

"**Facility**" means all contiguous land, and structures, other appurtenances, and improvements on the land, used in resource recovery and/or the treatment, handling, composting, storage, or disposal of solid waste. A facility may consist of several operational units (e.g., one or more landfills, cells, incinerators, compactors, or combinations thereof).

"**Final Cover**" means the material used to cover the top and sides of a landfill cell when fill operations cease.

"**Flood Plain**" means the lowland and relatively flat areas adjoining inland and coastal waters, that are inundated by the 100 YEAR FLOOD.

"**Fly Ash**" means a powdery residue resulting from the combustion of fuel or waste and captured by air pollution control equipment prior to exiting the smokestack.

"**Free Liquids**" means liquids which readily separate from the solid portion of a waste under ambient temperature and pressure, using any or all of the following tests: EPA Paint Filter Test; EPA Plate Test; EPA Gravity Test.

"**Garbage**" means any putrescible solid and semisolid animal and/or vegetable wastes resulting from the production, handling, preparation, cooking, serving or consumption of food or food materials.

"**Generation**" means the act or process of producing solid waste.

"**Generator**" means the producer or the source of the solid waste.

"**Geomembrane**" means a prefabricated continuous sheet of flexible polymeric or geosynthetic material.

"Gross Vehicle Weight Rating (GVWR)" or gross vehicle weight means the value specified by the manufacturer as the loaded weight of a single vehicle.

"**Ground Water**" means any water naturally found under the surface of the earth.

"**Hazardous Waste**" means a solid waste, or combination of solid wastes, 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 irreversible, illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. Without limitation, included within this definition are those hazardous wastes described in Sections 261.31, 261.32, and 261.33 of the Delaware Regulations Governing Hazardous Waste.

"**Household Waste**" means any solid waste derived from households (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas).

"**Hydraulic Conductivity**" means the capacity to transmit water. It is expressed as the volume of water that will move in a unit of time under a unit hydraulic gradient through a unit area.

"Impermeable" means having a hydraulic conductivity equal to or less than 1×10^{7} cm/sec as determined by field and laboratory permeability tests made according to standard test methods which may be correlated with soil densification as determined by compaction test.

"Industrial Landfill" means a land site at which industrial waste is deposited on or into the land as fill for the purpose of permanent disposal, except that it will not include any facility that has been approved for the disposal of hazardous waste under the Delaware Regulations Governing Hazardous Waste.

"Industrial Waste" means any water-borne liquid, gaseous, solid, or other waste substance or a combination thereof resulting from any process of industry, manufacturing, trade or business, or from the development of any agricultural or natural resource.

"Infectious Waste": see Section 11.3 for definitions pertaining to infectious waste.

"**Institutional Waste**" means solid waste that is generated by institutional enterprises such as social, charitable, educational, and government services and that is similar in nature to household waste.

"Intermediate Cover" means a layer of compacted earth, or other suitable material as approved by the Department, applied to a partially completed landfill.

"Landfill" means a natural topographic depression and/or man-made excavation and/or diked area, formed primarily of earthen materials, which has been lined with man-made and/or natural materials or remains unlined and which is designed to hold an accumulation of solid wastes.

"Leachate" means liquid that has passed through, contacted, or emerged from solid waste and contains dissolved, suspended, or miscible materials, chemicals, and microbial waste products removed from the solid waste.

"Lift" means a completed series of compacted layers within a cell.

"Liner" means a continuous layer of impermeable material beneath and on the sides of a landfill or landfill cell.

"Liquid Waste" means a waste that contains less than 20 percent solids or releases free liquids.

"Local Agency" means any special district, authority, municipality, county, or any other political subdivision.

"Materials Recovery Facility" means a facility at which materials, other than source separated materials, are recovered from solid waste for recycling or for use as an energy source.

"Municipal Solid Waste" means household waste and solid waste that is generated by commercial, institutional, and industrial sources and is similar in nature to household waste.

"Municipal Solid Waste Ash" means the ash resulting from the combustion of municipal solid waste in a thermal recovery facility.

"**New Sanitary Landfill Cell**" means any municipal solid waste landfill unit which has not received waste prior to the effective date of these regulations. "Sanitary Landfill Cell" has the same meaning as "Municipal Solid Waste Landfill Unit" in the RCRA Subtitle D (40 CFR Part 258) Regulations.

"**New Solid Waste Facility**" means a facility which was not in operation or for which construction had not commenced on or before the date of enactment of these regulations.

"**Onsite**" means on the same or geographically contiguous property which may be divided by public or private right-of-way. Noncontiguous properties owned by the same person but connected by a right-of-way which the owner controls and to which the public does not have access are also considered onsite property.

"**Open Burning**" means the combustion of solid waste without:

(1) Control of combustion air to maintain adequate temperature for efficient combustion,

(2) Containment of the combustion reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion, and

(3) Control of the emission of the combustion products.

"**Operator**" means the person responsible for the overall operation of a solid waste facility.

"**Owner**" means the person who owns a facility or any part of a facility.

"**Permittee**" means a person holding a permit issued by the Department pursuant to this regulation.

"**Person**" means any individual, trust, firm, joint stock company, federal agency, partnership, corporation (including a government corporation), association, state, municipality, commission, political subdivision of a state, any interstate body, company, society, or any organization of any form.

"**Personnel**" or "**Facility Personnel**" means all persons who work at, or oversee the operations of, a solid waste facility, and whose actions or failure to act may result in noncompliance with the requirements of the Delaware Solid Waste Regulations or other regulations under the jurisdiction of the State of Delaware.

"**Postclosure Care**" means maintenance and long-term monitoring of, and financial responsibility for, a closed facility.

"**Recharge Area**" means that portion of a drainage basin in which the net saturated flow of ground water is directed away from the water table.

"**Recyclable Material**" means a solid waste that exhibits the potential to be used repeatedly in place of a virgin material.

"**Recycling**" means the process by which recyclable materials, which would otherwise be disposed of as solid waste, are returned to the economic mainstream in the form of raw materials or products.

"**Refuse**" means any putrescible or nonputrescible solid waste, except human excreta, but including garbage, rubbish, ashes, street cleanings, dead animals, offal and solid agricultural, commercial, industrial, hazardous and institutional wastes, and construction wastes.

"**Regulated Medical Waste**": see Section 11.3 for definitions pertaining to Regulated Medical / Infectious Waste.

"**Resource Recovery**" means the process by which materials, excluding those under control of the Nuclear Regulatory Commission, which still have useful physical or chemical properties after serving a specific purpose are reused or recycled for the same or another purpose, including use as an energy source.

"**Resource Recovery Facility**" means a facility that is either a Materials Recovery Facility Or A Thermal Recovery Facility.

"**Rubbish**" means any nonputrescible solid waste, excluding ashes, such as cardboard, paper, plastic, metal or glass food containers, rags, waste metal, yard clippings, small pieces of wood, excelsior, rubber, leather, crockery, and other waste materials.

"**Runoff**" means any precipitation that drains over land from any part of a facility.

"**Runon**" means any precipitation that drains over land onto any part of a facility.

"**Salvaging**" means the controlled removal of solid waste from any facility for reuse of the waste material.

"**Sanitary Landfill**" means a land site at which solid waste is deposited on or into the land as fill for the purpose of permanent disposal, except that it will not include any facility that has been approved for the disposal of hazardous waste under the Delaware Regulations Governing Hazardous Waste.

"**Sanitary Landfill Cell Boundary**" means a vertical surface located at the hydraulically downgradient limit of the cell. This vertical surface extends down into the uppermost aquifer. "Sanitary Landfill Cell Boundary" has the same meaning as "Waste Management Unit Boundary" in the RCRA Subtitle D (40 CFR Part 258) Regulations. "Sanitary Landfill" has the same meaning as "MSWLF" in the RCRA Subtitle D (40 CFR Part 258) Regulations.

"**Saturated Zone**" means that part of the earth's crust in which all the voids are filled with water.

"**Scavenging**" means the uncontrolled and/or unauthorized removal of solid waste from any facility.

"**Secretary**" means the Secretary of the Department of Natural Resources and Environmental Control or his or her duly authorized designee.

"**Setback**" means the area between the actual disposal area and the property line which can be used for construction of environmental control systems such as runoff diversion ditches, monitoring wells, or scales.

"**Site**" means the area of land or water within the property boundaries of a facility where one or more solid waste treatment, resource recovery, recycling, storage or disposal areas are located.

"**Sludge**" means any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant.

"**Solid Waste**" means any garbage, refuse, rubbish, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded material, including solid, liquid, semisolid or contained gaseous material resulting from industrial, commercial, mining and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under 7 **Del.C.** Ch. 60, as amended, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of l954, as amended.

"**Source Separated**" means divided into its separate recyclable components at the point of generation.

"**Special Solid Wastes**" means those wastes that require extraordinary management. They include but are not limited to abandoned automobiles, white goods, used tires, waste oil, sludges, dead animals, agricultural and industrial wastes, infectious waste, municipal ash, septic tank pumpings, and sewage residues.

"**Storage**" means the holding of solid waste for a temporary period, at the end of which time the solid waste is treated, disposed of, or stored elsewhere.

"**Subbase**" means the supporting soil layers beneath a liner.

"**Surface Water**" means water occurring generally on the surface of the earth.

"**Thermal Recovery Facility**" means a facility designed to thermally break down solid waste and to recover energy from the solid waste.

"**Topsoil**" means the friable dark upper portion of a soil profile that contains mineral substances and organic material in varying degrees of decomposition and is capable of supporting vegetation.

"**Transfer Station**" means any facility where quantities of solid waste delivered by vehicle are consolidated or aggregated for subsequent transfer by vehicle for processing, recycling, or disposal.

"**Transportation**" means the movement of solid waste by air, rail, water, over the roadway, or on the ground.

"**Transporter**" means any person engaged in the transportation of solid waste.

"**Treatment**" means the process of altering the physical, chemical, or biological condition of the waste to prevent pollution of water, air, or soil or to render the waste safe for transport, disposal, or reuse.

"**Unconfined Aquifer**" means an aquifer in which the upper surface of the zone of saturation is at atmospheric pressure.

"**Uppermost Aquifer**" means the geologic formation nearest the natural ground surface that is an aquifer, as well as, lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary.

"**Variance**" means a permitted deviation from an established rule or regulation, or plan, or standard or procedure, as provided in 7 **Del.C.** Ch. 60.

"**Vector**" means a carrier organism that is capable of transmitting a pathogen from one organism to another.

"**Vehicle**" means a motorized means of transporting something. "Vehicle" includes both the motorized unit and all containerized units of a conveyance attached thereto.

"**Water Table**" means that surface in a ground water body at which the water pressure is atmospheric. It is defined by the levels at which water stands in wells that penetrate the water body just far enough to hold standing water.

"**Well**" means any excavation that is drilled, cored, bored, washed, driven, dug, jetted or otherwise constructed when the intended use of such excavation is for the location, testing, acquisition or artificial recharge of underground water, and where the depth is greater than the diameter or width.

"**Working Face**" means that portion of a landfill where waste is discharged, spread and compacted prior to placement of daily cover.

8 DE Reg. 354 (8/1/04)

4.0 Permit Requirements And Administrative Procedures

4.1 General Provisions

4.1.1 Permit required

4.1.1.2 No person that is subject to the requirements of Section 7.2 or 7.3 of these regulations shall transport solid waste in or through the State of Delaware without first having obtained an appropriate solid waste transporter's permit from the Department.

4.1.1.1 No person shall engage in the construction, operation, material alteration, or closure of a solid waste facility, unless exempted from these regulations under Section 2.3, without first having obtained a permit from the Department.

4.1.1.3 Permittees shall abide by the conditions of their permit issued by the Department.

4.1.2 Public notice; hearing

Within 60 days after receipt of a completed application and all other required information, the Department will give public notice and the opportunity for a public hearing as provided in 7 **Del.C.** Ch. 60. The cost of the advertisement shall be borne by the applicant. A 15 day comment period will follow the publication date of each public notice. If no meritorious adverse public comments are received during this period, and the Secretary does not deem a public hearing to be in the best interest of the State, the Department will enter into the permit approval/denial phase. If a meritorious request for a hearing is received during the comment period, or if the Secretary deems a hearing to be in the best interest of the State, a public hearing will be held as provided in 7 **Del.C.** §6004 and 6006.

4.1.3 Approval/denial

The Department shall act upon an application for a permit within 60 days after the close of the public notice comment period or upon receipt of the hearing officer's report if a hearing was required. When a final determination is made on an application, the Department shall issue a permit or send a letter of denial to the applicant explaining the reasons for the denial.

4.1.4 Suspension, revocation of permit

A permit may be revoked or suspended for violation of any condition of the permit or any requirement of this regulation, after notice and opportunity for hearing in accordance with 7 **Del.C.** Ch. 60.

4.1.5 Duration of permit

A permit will be issued for a specific duration which will be determined by the Department.

4.1.5.1 Solid waste facility operating permits (landfills, resource recovery facilities, transfer stations, incinerators) shall not be issued for periods greater than 10 years.

4.1.5.2 Post-closure permits shall be valid and enforceable throughout the entire post-closure period.

4.1.6 Permit renewal

Any person wishing to renew an existing permit that is to expire shall, not less than 180 days prior to the expiration date of the existing permit, submit to the Department, a permit renewal application form with all supporting documentation and appropriate fees as required by these regulations.

In the event that the permittee submits a timely application, (not less than 180 days prior to the expiration date of the existing permit) and the Department, through no fault of the permittee, is unable to make a final determination on the application before the expiration date of the existing permit, the Department may, at its discretion, grant an extension of that permit. If the Department issues an extension, all conditions of the permit will remain in effect, for a period of time which will be determined by the Department.

4.1.7 Modification of permit

4.1.7.1 A permittee may request modifications to a permit. All such requests must be submitted in writing to the Department.

4.1.7.2 The Department may initiate modification of a permit if it finds that the existing permit conditions either are not adequate or are not necessary to protect human health and the environment.

4.1.7.3 Public notice and opportunity for hearing in accordance with paragraph 4.1.2 of this Section shall be accomplished for all major modifications proposed for the permit. In the event a hearing is requested or deemed necessary by the Secretary, only the permit conditions subject to the modification shall be reopened for public comment.

4.1.7.4 Public notice shall not be required for minor modifications to the permit. Minor modifications are those which if granted would not result in any increased impact or risk to the environment or to the public health. Minor modifications include ~~but are not limited to~~:

4.1.7.4.1 Changes in operation or design which ~~are~~ do not ~~related to~~ involve.

4.1.7.4.2 Improvements to approved pollution control devices or procedures.

4.1.7.4.3 Administrative changes.

4.1.7.4.4 A change in monitoring or reporting frequency.

4.1.7.4.5 The correction of typographical errors.

4.1.7.4.6 Other permit modifications deemed minor by the Department.

~~4.1.8 Transfer of permit~~

~~The new owner must submit to the Department a written request for the transfer of a permit at least 90 days prior to the date of the proposed transfer. The transfer request must include the following submissions:~~

~~4.1.8.1 All of the information requested in 7 **Del.C.** Ch. 79.~~

~~4.1.8.2 A revised solid waste facility or transporter permit application, as appropriate.~~

~~4.1.8.3 A written agreement between the new and existing owner containing a specific date upon which the transfer of the permit will occur.~~

~~4.1.8.4 A demonstration that the new owner has satisfied any financial assurance requirements imposed by these regulations. For additional information on financial assurance requirements see section 4.1.11 of these regulations.~~

~~4.1.8.5 Once the aforementioned requirements have been submitted and are considered complete to the Department's satisfaction, the Department will give public notice and the opportunity for~~

~~a public hearing as provided in 7 **Del.C.** Ch. 60. For additional information on the public notice procedure see Section 4.1.2 of these regulations.~~

~~4.1.8.6 When a final determination is made on the permit transfer request, the Department shall issue a revised permit or send a letter of denial explaining the reasons that a revised permit could not be issued.~~

4.1.8 Transfer of a permit.

Until the permit has been transferred in accordance with this section of the regulations, the current permittee shall remain liable for compliance with all solid waste permit requirements, including liability for financial assurance, closure and post-closure care. The following submittals are required in order to complete a permit transfer.

4.1.8.1 At least 60 days prior to the proposed transfer, the current permittee shall submit their written request for transfer of the permit. The permittee shall submit the request to the Department and include the following:

4.1.8.1.1 Written notification of the proposed transfer to include the scope and schedule of the transfer and the company name, address, phone number, and point of contact information for the prospective transferee.

4.1.8.1.2 A written agreement between the current permittee and the prospective transferee, signed by both parties and containing a specific date upon which assets transfer will occur. The agreement must reference the specific solid waste permit for which transfer is sought and state both the current permittee's and the prospective transferee's desire for transfer of the permit. The agreement shall acknowledge that the current permittee is responsible for compliance with all permit requirements until the permit has been transferred to the transferee in accordance with the requirements of this section. The agreement shall acknowledge that the transferee will not interfere with the current permittee's ability to comply with the solid waste permit so long as the current permittee remains responsible for compliance with that permit.

4.1.8.1.3 Demonstration that financial assurance requirements will continue to be met by the current permittee until the permit transfer has been completed, including provisions for providing financial assurance in the event that the solid waste permit cannot be transferred by the time company assets are transferred.

4.1.8.2 At least 60 days prior to the proposed transfer, the prospective transferee shall submit a letter of intent to the Department and include the following:

4.1.8.2.1 A description of the transferee's training and experience with the permitted activity and a demonstration that the prospective transferee will be able to comply with applicable statutes, regulations, permit conditions and other requirements to which the current permittee is subject.

4.1.8.2.2 A written agreement between the current permittee and the prospective transferee, signed by both parties and containing a specific date upon which assets transfer will occur. The agreement must reference the specific solid waste permit for which transfer is sought and state both the current permittee's and the prospective transferee's desire for transfer of the permit. The agreement shall acknowledge that the current permittee is responsible for compliance with all permit requirements until the permit has been transferred to the transferee in accordance with the requirements of this section. The agreement shall acknowledge that the transferee will not interfere with the current permittee's ability to comply with the solid waste permit so long as the current permittee remains responsible for compliance with that permit.

4.1.8.2.3 The environmental permit application background statement required by 7 **Del.C.** Chapter 79.

4.1.8.2.4 Demonstration that the prospective transferee has satisfied the financial assurance requirements imposed by these regulations. For additional information on financial assurance requirements see section 4.1.11 of these regulations.

4.1.8.3 In the event that the transfer of the permit can not be completed because of either the current permittee's or the prospective transferee's failure to provide the submittals required in 4.1.8.1 and 4.1.8.2 above, the current permittee shall either:

4.1.8.3.1 close the facility in accordance with the closure requirements contained in the solid waste facility permit and these regulations, or

4.1.8.3.2 continue to maintain control of, and responsibility for the facility in compliance with the conditions of the permit and these regulations, including, but not limited to the requirements

for financial assurance, operations, recordkeeping, reporting, monitoring, closure, post closure care, and corrective actions if needed.

4.1.9 Enforcement

4.1.9.1 The Department reserves the right to inspect any site, or any vehicle intended for use in the transportation of solid waste, before issuing a solid waste permit for the site or the transporter.

4.1.9.2 The Department may, at any reasonable time, enter any permitted solid waste facility or inspect any vehicle being used in the transportation of solid waste in order to verify compliance with the permit and these regulations.

4.1.9.3 The Department may require such reports, interviews, tests or other information necessary for the evaluation of permit applications and the verification of compliance with the permit and these regulations.

4.1.9.4 Any person using land, or allowing the use of land, for the storage, processing, or disposal of solid waste who violates a requirement of this regulation shall be subject to the provisions of Sections 6005, 6013, 6018, and 6025(c) of 7 **Del.C.** Ch. 60.

4.1.10 Replacement of Contaminated Water Supplies

If the Department determines, based on information obtained by or submitted to the Department or the Division of Public Health, that any drinking water supply well has become contaminated as a result of the construction or operation of a solid waste facility, the owner or operator of the facility will be required to construct and maintain, at his or her expense, a permanent alternative water supply of comparable quantity and quality to the source before it was contaminated. Such a determination will be subject to the review procedures contained in 7 **Del.C.** Ch. 60.

4.1.11 Financial Assurance Criteria

4.1.11.1 Applicability and effective date

The requirements of this section apply to owners and operators of all solid waste facilities, except owners or operators who are State or Federal Government entities whose debts and liabilities are the debts and liabilities of the State or the United States.

4.1.11.2 Financial Assurance for Closure, Post-Closure Care, and Corrective Action

4.1.11.2.1 The owner or operator of a solid waste facility must provide assurance that the financial costs associated with closure, post-closure care, and corrective action can be met throughout the life of the facility until released from these requirements by the Department after demonstrating successful completion of compliance with the requirements for each of these activities.

4.1.11.2.2 The mechanisms used to demonstrate financial assurance under this section must ensure that the funds necessary to meet the costs of closure, post-closure care, and corrective action for known releases will be available whenever they are needed. Owners or operators must choose from the options specified in paragraphs (a) through (i) of this section, and comply with any conditions noted therein.

4.1.11.2.2.1 Trust Fund

Condition 1: The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State of Delaware agency.

Condition 2: The trust agreement shall be worded as prescribed by the Department.

Condition 3: The owner or operator shall submit the receipt from the trustee for the initial payment into the trust fund as well as the originally signed duplicate of the trust agreement for Department approval prior to receiving solid waste, or in the case of an existing facility, prior to the cancellation of the existing financial assurance mechanism.

Condition 4: Pay-in periods and amounts for all solid waste facilities shall be in accordance with those specified in 40 CFR Part 258.74, subsections (a)(2),(a)(3), (a)(4) and (a)(6) or otherwise acceptable to the Department.

Condition 5: Schedule A, attached to the trust agreement, shall list the facility name and address and the current cost estimate. Schedule A must relate the trust agreement to the specific facility and obligation(s) being assured and shall be updated at least annually to account for inflation or other increases to the cost estimate. Costs reflected in Schedule A shall not be reduced without the written consent of the Department.

Condition 6: Schedule B, attached to the trust agreement, shall list the property or money that the fund consists of initially. Property must consist of cash or securities acceptable to the trustee. Other property (e.g., real estate) is not an acceptable payment into the trust fund.

Condition 7: Exhibit A, attached to the trust agreement, shall list the persons designated by the Grantor to sign orders, requests, and instructions to the trustee.

Condition 8: Annual valuation. Annually, the trustee shall furnish to the Department and to the owner or operator, a statement confirming the value of the trust fund. Any securities in the trust fund shall be valued at market value as of no more than 60 days prior to the date the statement is submitted to the Department. If possible, the statement should be submitted during the month that Schedule A is adjusted annually.

Condition 9: The trustee shall make payments from the fund only as the Department directs to provide for the payment for the costs of corrective action, closure, and/or post-closure care.

Condition 10: After beginning closure, post-closure care, or corrective action, an owner or operator or other person authorized in accordance with Condition 7 may request reimbursements for partial expenditures by submitting itemized bills to the Secretary. The owner or operator may request reimbursements for partial closure, post-closure care, or corrective action only if sufficient funds are remaining in the trust fund to cover the maximum costs of completing the activities for which the trust agreement was established. Within 60 days after receiving bills for reimbursable closure, post-closure care, or corrective action activities, the Secretary will instruct the trustee to make reimbursements in those amounts as the Secretary specifies in writing. Reimbursements will be allowed only if the Secretary determines that the partial or final expenditures are in accordance with the approved closure, post closure care, or corrective action plan or are otherwise justified. If the Secretary has reason to believe that the maximum cost of closure over the remaining life of the facility will be significantly greater than the value of the trust fund, he/she may withhold reimbursements of such amounts as he/she deems prudent. If the Secretary does not instruct the trustee to make such reimbursements, he/she will provide the owner or operator with a detailed written statement of reasons.

Condition 11: Amendments. The trust agreement may be amended by an instrument in writing executed by the grantor, the trustee, and the Department, or by the trustee and the Department if the grantor ceases to exist.

Condition 12: Irrevocability and termination. Subject to Condition 11, the trust agreement shall be irrevocable and shall continue until terminated at the written agreement of the grantor, the trustee, and the Department, or by the trustee and the Department if the grantor ceases to exist.

4.1.11.2.2.2 Surety Bond for Payment or Performance

Condition 1: At a minimum, the surety company issuing the bond must be listed in Circular 570 of the U.S. Department of Treasury as qualified in the state where the bond was executed.

Condition 2: The surety's underwriting limit must be at least as great as the amount of the surety bond.

Condition 3: The surety bond shall be worded as prescribed by the Department.

Condition 4: The owner or operator shall submit the bond and standby trust fund for Department approval prior to receiving solid waste, or in the case of an existing facility, prior to the cancellation of the existing financial assurance mechanism.

Condition 5: Standby trust fund. The owner or operator must establish a standby trust fund, and the standby trust fund must meet the requirements of these regulations except that initial and annual payments are not required. Updates of Schedule A, and annual valuation reporting will not be required until payment is made into the trust fund. Payments made under the terms of the surety bond shall be deposited by the issuing institution directly into the standby trust fund.

Condition 6: The payment surety bond may not be used for corrective actions.

Condition 7: Under the terms of the bond, the surety may cancel the bond by sending notice of cancellation to the Secretary of the Department, to the Solid and Hazardous Waste Management Branch, and to the owner and operator at least 120 days in advance of cancellation. If the Surety cancels the bond, the owner or operator must obtain alternate financial assurance. The Department may draw on the surety bond if the owner or operator has not provided alternative financial assurance within 90 days after receipt by the Solid Waste Management Branch of a notice of cancellation from the surety.

Condition 8: The owner or operator may cancel the surety bond if the Department provides its written consent to do so. The Department will provide such written consent when the owner substitutes alternate financial assurance as specified in these regulations or the bonded activity has been completed in accordance with these regulations.

Condition 9: The surety shall become liable on the bond when the owner or operator has failed to fulfill the closure, post-closure care or corrective action activities as required. Upon notification by the Department that the owner or operator has failed to perform closure or post-closure care guaranteed by a payment bond, the surety shall place funds in the amount guaranteed for the facility into the standby trust fund. Upon notification that the owner or operator has failed to perform closure, post-closure care, or corrective action as guaranteed by a performance bond, the surety shall either perform the activities guaranteed by the bond or place funds in the amount guaranteed for the facility into the standby trust fund.

4.1.11.2.2.3 Letter of Credit

Condition 1: The issuing financial institution must be an entity which has the authority to issue letters of credit and whose letter of credit operations are regulated and examined by a Federal or State of Delaware agency.

Condition 2: The letter of credit shall be worded as prescribed by the Department.

Condition 3: Accompanying letter. The owner or operator shall also submit an accompanying letter referring to the letter of credit by number and listing the following information: complete name and address of facility, issuing institution and date, and amount and purpose of funds assured.

Condition 4: The owner or operator shall submit the letter of credit and accompanying letter for Department approval prior to receiving solid waste, or in the case of an existing facility, prior to the cancellation of the existing financial assurance mechanism.

Condition 5: The letter of credit must be irrevocable and issued for a period of at least one year. The letter of credit must provide that the expiration date will be automatically extended for a period of at least one year unless, at least 120 days before the current expiration date, the issuing institution notifies the Secretary of the Department, the Solid and Hazardous Waste Management Branch, and the owner or operator of a decision not to extend the expiration date.

Condition 6: Once the issuing financial institution notifies the Solid and Hazardous Waste Management Branch of its intent not to extend the Letter of Credit, the owner or operator must, within 90 days, provide alternate financial assurance. The Department may draw on the letter of credit if the owner or operator has not provided alternative financial assurance within 90 days.

Condition 7: Following a determination by the Secretary of the Department that the owner or operator has failed to perform closure, post-closure care, or corrective action when required to do so, the Department may draw on the letter of credit.

4.1.11.2.2.4 Insurance

Condition 1: The insurer must be licensed to transact the business of insurance in one or more states or be eligible to provide insurance as an excess or surplus lines insurer in one or more states.

Condition 2: Captive insurance companies and risk retention groups can not be used to satisfy the requirements of this section.

Condition 3: Insurance is not an allowable mechanism for demonstrating financial responsibility for corrective action.

Condition 4: The policy must guarantee that the funds will be available whenever needed and that the insurer will be responsible for paying out funds to authorized persons.

Condition 5: The policy must allow assignment to a successor owner or operator. Assignment may be conditional upon consent of the insurer provided that such consent is not unreasonably refused.

Condition 6: The policy must provide that the insurer may not cancel, terminate or fail to renew the policy except for failure to pay the premium. The automatic renewal of the policy must, at a minimum, provide the insured with the option of renewal at the face amount of the expiring policy.

Condition 7: If the owner or operator fails to pay the premium, the insurer may cancel the policy by sending notice of cancellation by certified mail to the Secretary of the Department, to the Solid and Hazardous Waste Management Branch, and to the owner or operator of the facility, at least 120 days in advance of the cancellation and date of expiration. Cancellation, termination, or failure to renew may not occur and the policy will remain in full force and effect in the event that on or before the date of expiration, the Secretary of the Department deems the facility abandoned; or the permit is terminated or revoked or a new permit is denied; or closure is ordered by the Secretary of the Department, or a U.S. District Court or other court of competent jurisdiction; or the owner or operator is named as debtor in a voluntary or involuntary proceeding under Title 11 (Bankruptcy) USC; or the premium due is paid.

Condition 8: Prior to requesting reimbursement from the insurer, owners or operators shall submit justification and documentation of the reimbursable expenses to the Department for its consent.

Condition 9: A copy of the policy shall be submitted to the Department for its approval prior to receiving solid waste, or in the case of an existing facility, prior to the cancellation of the existing financial assurance mechanism.

4.1.11.2.2.5 Local Government Financial Test and Guarantee

Condition 1: Financial tests and guarantees shall not be used for assuring funds for post-closure periods or corrective actions.

Condition 2: Guarantees shall be worded as specified by the Department.

Condition 3: A local government is not eligible to assure its obligations by this mechanism if it: is currently in default of any outstanding general obligation bonds; or has any general obligation bonds rated lower than Baa as issued by Moody's or BBB as issued by Standard and Poor's; or operated at a deficit equal to five percent or more of total annual revenue in each of the past two fiscal years; or received an adverse opinion, disclaimer of opinion, or other qualified opinion from the independent certified public accountant (or appropriate state agency) auditing its financial statement, and the Department deems the reason for the qualification as significant.

Condition 4: Bond Rating/Financial Ratio Alternatives. The local government must meet one of the following two financial tests: a) If the local government has outstanding, rated, general obligation bonds that are not secured by insurance, a letter of credit, or other collateral

or guarantee, it must have a current rating of Aaa, Aa, A, or Baa, as issued by Moody's, or AAA, AA, A, or BBB as issued by Standard and Poor's on all such general obligation bonds; or b) Based upon the most recently audited annual financial statement, a ratio of cash plus marketable securities to total expenditures greater than or equal to 0.05, and a ratio of annual debt service to total expenditures less than or equal to 0.20.

Condition 5: The total costs being assured through a financial test must not exceed 43 percent of the local government's total annual revenue. If the local government assures other environmental obligations through financial tests; including those associated with UIC facilities under 40 CFR 144.62, underground storage tank facilities under 40 CFR Part 280, PCB storage facilities under 40 CFR Part 761, and hazardous waste treatment, storage, and disposal facilities under 40 CFR Parts 264 and 265; it must add those costs to the closure costs it seeks to assure under this mechanism.

Condition 6: Public Notice. The local government shall place a reference to the closure costs assured through the financial test into its next comprehensive annual financial report (CAFR).

Condition 7: Accountant's Opinion. A Certified Public Accountant's opinion of the local government's financial statements for the most recent fiscal year must also be included in the initial financial assurance package and annually no later than 90 days after the close of the local government's fiscal year. The opinion must be unqualified and demonstrate that the local government has prepared its financial statements in accordance with the requirements of the General Accounting Standards Board Statement 18.

Condition 8: Chief Financial Officer letter. The Chief Financial Officer must include a letter demonstrating that the local government has complied with Conditions 3, 4, 5, and 6. The CFO letter shall be submitted to the Department as part of the initial financial assurance package and annually no later than 90 days after the close of the local government's fiscal year.

Condition 9: If, at the end of any fiscal year, the local government fails to meet the financial test criteria required by conditions 3, 4, or 5, then the local government shall send, within 90 days, by certified mail, notice to the Secretary of the Department and to the Solid and Hazardous Waste Management Branch, that they intend to provide alternate financial assurance as required by these regulations. The local government shall, within 210 days following the close of the fiscal year, obtain alternative financial assurance that meets the requirements of these regulations.

Condition 10: The guarantee, approved by the Department, must be effective prior to the initial receipt of waste or in the case of an existing facility, prior to the cancellation of the existing financial assurance mechanism.

Condition 11: The guarantee shall remain in force unless the local government sends notice of cancellation by certified mail to the Secretary of the Department and to the Solid and Hazardous Waste Management Branch. Such notice shall be given at least 120 days in advance of the cancellation. Within 90 days of receipt of this notice of cancellation by the Solid and Hazardous Waste Management Branch, the local government shall provide alternative financial assurance acceptable to the Department.

4.1.11.2.2.6 Corporate Financial Test and Guarantee

Condition 1: Financial tests and guarantees shall not be used for assuring funds for post-closure periods or corrective actions.

Condition 2: Guarantees shall be worded as prescribed by the Department.

Condition 3: A resolution agreeing to the terms and conditions of the guarantee and signed by the guarantor's board of directors shall be attached to the guarantee.

Condition 4: The guarantor must be the direct or higher tier parent company of the owner or operator, or a firm whose parent corporation is also the parent corporation of the owner or operator.

Condition 5: Minimum size requirement. The guarantor must have a tangible net worth equal to the sum of the costs they seek to assure through a financial test, plus $10 million. The costs that the guarantor seeks to assure are equal to the current cost estimates for closure, post-closure care, corrective action, and any other environmental obligation assured by a financial test and/or corporate guarantee by the guarantor (including other landfills or solid waste facilities; PCB storage facilities; underground storage tanks; hazardous waste treatment, storage, disposal facilities; or underground injection control program facilities).

Condition 6: Bond Rating/Financial Ratio Alternatives. Guarantors must meet one of the following three financial tests:

a) A most recent bond rating no lower than Baa as issued by Moody's or BBB as issued by Standard and Poor's.

b) A leverage ratio of less than 1.5 based on the ratio of total liabilities to tangible net worth.

c) A profitability ratio of greater than 0.10 based on the sum of the net income plus depreciation, depletion and amortization, minus $10 million, to total liabilities.

Condition 7: Domestic Assets Requirement. Guarantors must have assets in the United States at least equal to the costs they seek to assure through a financial test (costs include those reported for Condition 5).

Condition 8: Chief Financial Officer letter. The Chief Financial Officer must include a letter demonstrating that the guarantor has complied with Conditions 4, 5, 6, and 7. The CFO letter shall be submitted to the Department as part of the initial financial assurance package and annually no later than 90 days after the close of the guarantor's fiscal year.

Condition 9: Accountant's Opinion. A Certified Public Accountant's opinion of the guarantor's financial statements for the most recent fiscal year must also be included in the initial financial assurance package and annually no later than 90 days after the close of the guarantor's fiscal year. The opinion must be unqualified (not modified by conditions or reservations) and demonstrate that the firm has prepared its financial statements in accordance with generally accepted accounting principals for corporations.

Condition 10: Special Report. In the event that the CFO does not use financial test figures directly form the annual statements provided to the Securities and Exchange Commission, then a special report from an independent accountant shall be required. In the report, the Certified Public Accountant must confirm that the data used in the CFO letter was appropriately derived from the audited, year-end financial statements.

Condition 11: Incapacity. The guarantor shall notify the Secretary of the Department and the Solid and Hazardous Waste Management Branch by certified mail of the commencement of a voluntary or involuntary proceeding under Title 11 Bankruptcy, USC, naming the guarantor, owner or operator of the facility as debtor, within 10 days after commencement of the proceeding.

Condition 12: If, at the end of any fiscal year, the guarantor fails to meet the financial test criteria required by conditions 5, 6, or 7, then the guarantor shall send, within 90 days, by certified mail, notice to the Secretary of the Department, to the Solid and Hazardous Waste Management Branch, and to the owner or operator, that guarantor intends to provide alternate financial assurance as required by these regulations. Within 120 days of such fiscal year, the guarantor shall establish such financial assurance unless the owner or operator has done so.

Condition 13: Within 30 days of being notified by the Department that a determination has been made that the guarantor no longer meets the requirements stated in Conditions 5, 6, or 7, the guarantor shall establish alternate financial assurance in accordance with these regulations.

Condition 14: The guarantee, approved by the Department, must be effective prior to the initial receipt of waste or in the case of an existing facility, prior to the cancellation of the existing financial assurance mechanism.

4.1.11.2.2.7 Department-Approved Mechanism.

4.1.11.2.2.8 State Assumption of Responsibility.

Use of Multiple Financial Mechanisms (any combination of the options listed above).

The language of the financial assurance mechanisms listed in this section must satisfy the following criteria:

4.1.11.2.2.8.1 They must ensure that the amount of funds assured is sufficient to cover the costs of closure, post-closure care, and corrective action for known releases when needed.

4.1.11.2.2.8.2 They must ensure that funds will be available in a timely fashion when needed.

4.1.11.2.2.8.3 They must be obtained by the owner or operator by the effective date of these requirements or prior to the initial receipt of solid waste, whichever is later, in the case of closure and post-closure care, and no later than 120 days after the corrective action remedy has been selected, until the owner or operator is released from the financial assurance requirements.

4.1.11.2.3 They must be legally valid, binding, and enforceable under State law.

4.1.11.2.4 Upon request by the Department, the applicant or permittee shall provide a third party review of the financial assurance documents submitted. The third party review must certify to the Department that the financial assurance documents as submitted by the applicant or permittee meet the requirements of Section 4.1.11.2.2 of these regulations, and be sealed and signed by a Certified Public Accountant duly registered in Delaware, or other professional acceptable to the Department.

4.1.11.2.5 The application shall not be deemed complete until and unless the applicant has complied with Section 4.1.11.2.4 of these regulations as specified above.

4.1.11.3 Cost Estimate for Closure

4.1.11.3.1 The owner or operator must submit to the Department a detailed written estimate, in current dollars, of the cost of closing the facility that is consistent with the closure plan developed in accordance with the closure requirements for that type of facility. The estimate must equal the maximum cost of closure at any time during the active life of the facility. The owner or operator shall also notify the Secretary in writing that the estimate has been placed in the records to be maintained at the facility.

4.1.11.3.2 Until final closure of the facility, the owner or operator must annually adjust the closure cost estimate for inflation, facility expansions, and any other applicable requirements which impact the cost of closure.

4.1.11.3.3 The owner or operator must increase the cost estimate and the amount of financial assurance provided for closure if changes to the closure plan or facility conditions increase the maximum cost of closure at any time during the remaining active life.

4.1.11.3.4 The Department may approve reduction in the amount of financial assurance provided for closure if the latest cost estimate is significantly less than the maximum cost of the current closure plan. The owner or operator must submit to the Secretary in writing the justification for the reduction of the closure cost estimate and the amount of financial assurance. Any changes in the amount of financial assurance must also be placed in the records to be maintained at the facility.

4.1.11.4 Cost Estimate for Post-Closure Care

4.1.11.4.1 The owner or operator of a solid waste facility for which post-closure care is required must demonstrate financial assurance for the cost of thirty (30) years of post-closure care. The owner or operator must submit to the Department a detailed written estimate, in current dollars, of the cost of hiring a third party to conduct post-closure care for the solid waste facility in compliance with the post-closure plan. This estimate must be based on the most expensive costs of post-closure care during the post-closure care period. The owner or operator must also notify the Department in writing that the estimate has been placed in the records to be maintained at the facility.

4.1.11.4.2 During the active life of the solid waste facility and during the post-closure care period, the owner or operator must annually adjust the post-closure cost estimate for inflation and other applicable factors.

4.1.11.4.3 The owner or operator must increase the post-closure care cost estimate and the amount of financial assurance provided if changes in the post-closure plan or solid waste facility conditions increase the maximum costs of post-closure care.

4.1.11.4.4 The Secretary may approve the reduction of the post-closure cost estimate and the amount of financial assurance provided if the latest cost estimate is significantly less than the maximum costs of post-closure care remaining over the post-closure care period. The owner or operator must submit to the Secretary in writing the justification for the reduction of the post-closure cost estimate. Any changes in the amount of financial assurance must also be placed in the records to be maintained at the facility.

4.1.11.5 Cost Estimate for Corrective Action

4.1.11.5.1 An owner or operator of a solid waste facility required to undertake a corrective action program must submit to the Secretary in writing a detailed written estimate, in current dollars, of the cost of hiring a third party to perform the corrective action. The corrective action cost estimate must account for the total costs of corrective action activities as described in the corrective action plan for the entire corrective action period. The owner or operator must also notify the Secretary that the cost estimate has been placed in the records to be maintained at the facility.

4.1.11.5.2 The owner or operator must annually adjust the estimate for inflation and any other applicable factors until the corrective action program is completed.

4.1.11.5.3 The owner or operator must increase the corrective action cost estimate and the amount of financial assurance provided if changes in the corrective action program or facility conditions increase the maximum costs of corrective action.

4.1.11.5.4 The Secretary may approve reduction of the amount of the corrective action cost estimate and the amount of financial assurance provided if the cost estimate exceeds the maximum remaining costs of corrective action. The owner or operator must submit to the Secretary in writing the justification for the reduction of the corrective action cost estimate. The owner or operator must also notify the Secretary in writing that the amended amount of financial assurance has been placed in the records to be maintained at the facility.

4.2 Application Procedures For Sanitary And Industrial Landfills

4.2.1 Application

Any person desiring to construct or operate a sanitary or industrial landfill or cell must submit a letter of intent to the Department. The letter should indicate the projected design and usage of the proposed facility. The letter of intent shall be followed by the submission, by the applicant, of the following additional information:

4.2.1.1 A Solid Waste Management Facility Application, provided by the Department. All information provided by the applicant is certified to be true, accurate, and complete by the applicant’s signature on the provided application.

4.2.1.2 Proof of ownership of the property. If the applicant does not own the property, a copy of the lease agreement and the owner's permission to conduct the proposed activity on the property must also be submitted.

4.2.1.3 A plan of operation

This shall include the following:

4.2.1.3.1 A narrative description of the type of facility and of the solid waste handling and disposal procedures to be used,

4.2.1.3.2 A narrative explaining the methods and schedule for operation, modification, use, and maintenance of the various components of the facility,

4.2.1.3.3 A description of the proposed monitoring methods,

4.2.1.3.4 A description of the proposed methods for controlling noise, litter, odors, insects, and rodents, and

4.2.1.3.5 A contingency plan to be implemented in case of emergency (e.g., a fire, explosion, or spill that threatens public health and safety or the environment).

4.2.1.4 An engineering report

This report shall be prepared and signed by a Professional Engineer registered in Delaware and shall include the following:

4.2.1.4.1 Descriptions and specifications of all proposed design features,

4.2.1.4.2 A description of the proposed installation methods and procedures,

4.2.1.4.3 A schedule of events for construction of the facility,

4.2.1.4.4 Proposed design capacity in both tons and cubic yards per day, and projected life expectancy of the facility,

4.2.1.4.5 A construction quality assurance plan.

~~4.2.1.4.6 A schedule of events for construction of the facility,~~

~~4.2.1.4.7 Proposed design capacity in both tons and cubic yards per day, and projected life expectancy of the facility.~~

~~4.2.1.4.8 A construction quality assurance plan.~~

4.2.1.5 A hydrogeological assessment

A hydrogeological investigation must be performed at the proposed site and approved by the Department before a construction permit will be issued. This investigation shall include a series of test borings and wells, constructed to a depth and in a number sufficient to identify:

4.2.1.5.1 The occurrence and characteristics of the unconfined and first confined aquifers,

4.2.1.5.2 Ground water flow directions,

4.2.1.5.3 Ambient ground water quality,

4.2.1.5.4 Potential pathways of contaminants to points of ground water discharge,

4.2.1.5.5 Approximate ground water flow rates and travel times from the facility to points of discharge (including wells and/or surface water).

In addition, delineation of the anticipated maximum elevation of the seasonal high water table shall be provided.

This investigation and report shall be signed by a Professional Geologist registered in Delaware.

4.2.1.6 An environmental assessment

An environmental assessment shall be performed to provide a detailed analysis of the potential impact of the proposed facility on the environment. Factors to be considered include:

Air quality
Water quality
Stream flow
Fish and wildlife
Plants
Threatened or endangered species
Water uses
Land use
Aesthetics
Traffic
Public health and safety
Cultural, recreational, and natural areas

Historic sites

Social and economic factors.

Soil Quality

If the applicant or the Department determines that the proposed facility may cause a threat to human health or the environment, the applicant must provide a written explanation of how he or she plans to mitigate the potential harm.

4.2.1.7 Topographical and site location maps

This shall include a topographical map or series of maps on a scale satisfactory to the Department but in no case less than one inch equal to 400 feet, showing topographic elevations surveyed with reference to mean sea level, and any necessary narrative descriptions, including but not limited to the following:

4.2.1.7.1 The legal boundaries of the property as determined by a survey performed by a registered surveyor; the names of the present owners of the proposed site and of all adjacent lands; and a description of all title, deed, or usage restrictions affecting the proposed permit area.

4.2.1.7.2 The boundaries of the facility over the estimated total life of the proposed operation, including the boundaries of land that will be affected in each sequence of disposal activity.

4.2.1.7.3 The boundaries of land where solid waste will be stored at any time over the estimated total life of the proposed operation.

4.2.1.7.4 The locations and names of all water supply wells or surface water intakes within 1/4 mile of the disposal site boundaries.

4.2.1.7.5 Proof that all applicable zoning approvals and all appropriate federal, state, and local environmental permits have been obtained.

4.2.1.7.6 Closure plan as described in Section ~~5.J.3~~ 5.10.3 or 6.10.3, as appropriate.

4.2.1.8 Proof of financial responsibility for closure and post-closure care, as described in Section 4.A.11.

4.2.1.9 Proof that the facility meets the siting criteria required by Section 5.A. or 6.A.

4.2.1.10 Any other related reports, data, maps, or information that the Department requires.

4.2.1.11 Construction and Operation

4.2.1.11.1 The applicant shall not commence construction of the landfill or cell until the Department has issued the solid waste permit required by these regulations.

4.2.1.11.2 After construction has been completed and prior to the placement of solid waste, the permittee shall submit a final report for the Department's approval. The final report shall certify that the construction of the landfill or cell was completed in accordance with the engineering report to include the Construction Quality Assurance Plan, construction and material specifications, and design drawings. The final report shall be certified correct by the construction quality assurance engineer, who must be a Professional Engineer registered in Delaware. The permittee shall not place solid waste into the newly constructed landfill or cell until the Department has provided its written notification that the construction and the final report meet the requirements of the permit and the Delaware Regulations Governing Solid Waste.

4.2.1.11.3 Closure

4.2.1.11.3.1 Any person wishing to modify their current permit to allow closure of a facility or part thereof must submit the following to the Department at least 180 days prior to the projected date when wastes will no longer be accepted:

4.2.1.11.3.1.1 Notification of intent to close,

4.2.1.11.3.1.2 Closure plan as described in Section 5.10.3 or 6.10.3, as appropriate,

4.2.1.11.3.1.3 Post-closure care plan describing how the requirements of Section 5.K or 6.K (as appropriate) will be met.

4.2.1.11.3.2 If the Department determines that the closure plan and supporting documents are sufficient to ensure closure, it will modify the permit to allow closure to be performed. The owner or operator of the landfill shall not commence closure of the landfill or cell without first obtaining the necessary permit modifications.

4.2.1.11.3.3 After closure has been completed, the permittee shall submit a final report for the Department's approval. The final report shall certify that the closure of the landfill or cell was completed in accordance with the closure plan to include the Construction Quality Assurance Plan, construction and material specifications, and design drawings. The final report shall be certified correct by the construction quality assurance engineer, who must be a Professional Engineer registered in Delaware. The landfill or cell shall not be considered closed until the Department has provided its written notification that the closure has been accomplished in accordance with the solid waste permit and these regulations.

4.2.1.11.3.4 Facilities entering the Post-closure period will be issued a post-closure permit based upon the approved post-closure plan, monitoring requirements, gas and leachate control, maintenance, and corrective actions (if required).

4.3 This Paragraph Reserved

4.4 Application Procedures For Resource Recovery Facilities

4.4.1 Application

Any person desiring to construct or operate a resource recovery facility must submit a letter of intent to the Department. The letter should indicate the projected design and usage of the proposed facility. The letter of intent shall be followed by the submission, by the applicant, of the following additional information:

4.4.1.1 A Solid Waste Management Facility Application, provided by the Department. All information provided by the applicant is certified to be true, accurate, and complete by the applicant's signature on the provided application.

4.4.1.2 Proof of ownership of the property. If the applicant does not own the property, a copy of the lease agreement and the owner's permission to conduct the proposed activity on the property must also be submitted.

4.4.1.3 A plan of operation

This shall include the following:

4.4.1.3.1 A narrative description of the type of facility and of the solid waste handling and disposal procedures to be used.

4.4.1.3.2 A narrative explaining the methods and schedule for operation, modification, use, and maintenance of the various components of the facility. This shall include a description of the procedures for facility start up and for scheduled and unscheduled shut down operations.

4.4.1.3.3 A description of the solid wastes that will be accepted at the facility, the manner in which recyclable components will be removed from the solid waste stream, the markets for these recyclable materials, and the proposed disposition of the nonrecyclable components and residuals.

4.4.1.3.4 A description of the proposed monitoring methods.

4.4.1.3.5 A description of the measures that will be used to ensure that unauthorized and unwanted solid wastes are prevented from entering the facility.

4.4.1.3.6 A description of the personnel training program, including training that will be provided to ensure compliance with Sections 9.4.2.5 and 9.4.2.7 of these regulations.

4.4.1.3.7 A description of the proposed methods for controlling noise, litter, odors, insects, rodents, dust, fires, and explosions.

4.4.1.3.8 A detailed contingency plan to be implemented in case of an emergency such as a spill, accident, or explosion.

4.4.1.4 An engineering report

This report shall be prepared and signed by a Professional Engineer registered in Delaware and shall include the following:

4.4.1.4.1 A drawing or drawings showing the complete layout of the proposed facility.

4.4.1.4.2 Mass and energy balances, including calculations and pertinent facts relating to the development of these balances.

4.4.1.4.3 Descriptions and specifications of all proposed design features that the engineer has provided to the owner of the facility.

4.4.1.4.4 A description of the proposed installation methods and procedures.

4.4.1.4.5 A plan for third party quality assurance for the construction and installation of components of the facility that will be used in the processing, handling, and/or monitoring of solid waste.

4.4.1.4.6 A schedule of events for construction of the facility.

4.4.1.4.7 Proposed design capacity per day, and life expectancy of the facility.

4.4.1.4.8 A description of potential safety hazards and methods of control.

4.4.1.4.9 An analysis of the concept of the facility's expansion at a later date, if and when deemed necessary by the Department.

4.4.1.4.10 An identification of possible ground water and surface water discharges.

4.4.1.5 A recycling analysis

This analysis shall consist of the following:

4.4.1.5.1 Identification of available and potential markets for recovered recyclable.

4.4.1.5.2 An evaluation of the impact that alternative source separation/ recyclables recovery programs could have on the facility. If a thermal recovery facility is the subject of the application, this shall include an engineering analysis of the BTU value of the solid waste before and after recyclables recovery for the proposed life of the project to determine if increases in recycling activities will necessitate changes in facility size and capacity.

4.4.1.6 A plan for sampling, analysis, and disposition of the ash generated by the facility (for thermal recovery facilities only). The plan shall include a strategy for ash testing during the test burn phase of construction. Testing shall be in accordance with Delaware's Regulations Governing Hazardous Waste or other testing protocol acceptable to the Department. The plan also shall include a proposal for treatment and/or disposal of the ash. The proposed methods for treatment and/or disposal shall conform to all applicable state and federal regulations.

4.4.1.7 A hydrogeological assessment, if deemed necessary by the Department

A hydrogeological investigation of the proposed site may be required before the Department will issue a permit. The report resulting from this investigation shall be signed by a Professional Geologist registered in Delaware.

4.4.1.8 An environmental assessment

The environmental assessment shall provide a detailed analysis of the potential impact of the proposed facility on the environment. Factors to be considered include, but are not necessarily limited to:

Air quality
Water quality
Stream flow
Fish and wildlife
Plants
Threatened or endangered species
Water uses

Land use
Aesthetics
Soil quality
Traffic
Public health and safety
Cultural, recreational, and natural areas
Historic sites
Social and economic factors.
Soil Quality.

If the applicant or the Department determines that the proposed facility may cause a threat to human health or the environment, the applicant must provide a written explanation of how he or she plans to mitigate the potential harm.

4.4.1.9 Topographical and site location maps

This shall include a topographical map or series of maps on a scale satisfactory to the Department but in no case less than one inch equal to 400 feet, showing topographic elevations surveyed with reference to mean sea level, and any necessary narrative descriptions, including but not limited to the following:

4.4.1.9.1 The legal boundaries of the property as determined by a survey performed by a registered surveyor; the names of the present owners of the proposed site and of all adjacent lands; and a description of all title, deed, or usage restrictions and all easements affecting the proposed permit area.

4.4.1.9.2 The boundaries of land where solid waste will be stored at any time over the estimated total life of the proposed operation.

4.4.1.9.3 The locations and names of all water supply wells or surface water intakes within 1/4 mile of the site boundaries.

4.4.1.10 Proof that all applicable zoning approvals have been obtained and application has been made for all appropriate federal, state, and local environmental permits.

4.4.1.11 A conceptual closure plan. This shall address the items listed in Section 9.5.3 to the extent possible at the time of initial permit application and shall be revised and updated as necessary to reflect changes in plans that will affect the cost of closure.

4.4.1.12 Proof of financial responsibility for closure, as described in Section 4.1.11.2.

4.4.1.13 Proof that the facility meets the siting criteria required by Section 9.2.

4.4.1.14 Any other related reports, data, maps, or information that the Department requires.

4.4.2 Construction and operation

4.4.2.1 The applicant shall not commence construction of a new resource recovery facility or operate an existing resource recovery facility until the applicant has received a permit from the Department in accordance with these regulations.

4.4.2.2 After the construction of a new resource recovery facility has been completed, and prior to the receipt of solid waste or materials for processing, the permittee shall submit a final report for the Department's approval. The final report shall certify that the construction of the resource recovery facility was completed in accordance with the engineering report to include the quality assurance plan, construction and material specifications and design drawings. The final report shall be certified correct by the third-party quality assurance engineer, who must be a Professional Engineer registered in Delaware. The permittee shall not commence operations, store or receive solid waste or materials to be processed until the Department has provided its written notification that the construction and the final report meet the requirements of the permit and the Delaware Regulations Governing Solid Waste.

4.4.3 Closure

Any person desiring to close a resource recovery facility shall, at least 180 days before the date on which the facility will stop accepting solid waste, submit the following to the Department:

4.4.3.1 Written notification of intent to close.

4.4.3.2 Updated closure plan.

4.4.3.3 Closure schedule

4.4.3.4 An evaluation of the impact that closing the facility will have on the flow of solid waste in the region serviced by the facility, and a plan for minimizing any disruption in the flow.

If the Department approves the closure plan and closure schedule, it will modify the facility's permit to allow closure to take place.

4.5 Application Procedures For Transfer Stations

4.5.1 Application

Any person desiring to construct or operate a transfer station must submit a letter of intent to the Department. For proposed facilities, the letter shall narrate the projected design and usage of the facility; provide a tentative schedule for construction and startup, and summarize the applicant’s experience and training with transfer station operations. For existing facilities, the letter shall state the reason for the application submittal and include a narration about design, usage, and schedule only if new construction is proposed. After submitting the Letter of Intent, the applicant shall submit the following:

4.5.1.1 A Solid Waste Management Facility Application, provided by the Department. All information provided by the applicant is certified to be true, accurate, and complete by the applicant’s signature on the provided application.

4.5.1.2 Proof of ownership of the property. If the applicant does not own the property, a copy of the lease agreement and the owner's permission to conduct the proposed activity on the property must be submitted.

4.5.1.3 A plan of operation

The applicant shall submit a plan of operation in a format that includes a dated title page (title, name/location of facility, author, permittee name), a table of contents, numbered pages, labeled chapters and subsections, and numbered paragraphs. Content of the plan shall include the following:

4.5.1.3.1 A narrative description of the type of facility and of the solid waste handling procedures to be used.

4.5.1.3.2 A narrative explaining the methods and schedule for operation, modification, use, and maintenance of the various components of the facility.

4.5.1.3.3 A description of the proposed methods for controlling noise, litter, odors, insects, rodents, dust, leachate, and facility washdown water.

4.5.1.3.4 A description of the methods that will be used to prevent unauthorized wastes from ~~entering~~ being accepted at the facility.

4.5.1.3.5 A contingency plan to be implemented in case of emergency (e.g., a fire, explosion, or spill that threatens public health and safety or the environment.)

4.5.1.4 An engineering report

This report shall be prepared and signed by a Professional Engineer registered in Delaware and shall include the following:

4.5.1.4.1 Descriptions, plans, and specifications of all proposed design features.

4.5.1.4.2 A description of the proposed installation methods and procedures.

4.5.1.4.3 A schedule of events for construction of the facility.

4.5.1.4.4 Proposed design capacity in both tons and cubic yards per day.

4.5.1.5 A hydrogeological assessment, if deemed necessary by the Department. A hydrogeological investigation of the proposed site may be required before the Department will issue a permit.

This investigation shall include a series of test borings and wells, constructed to a depth and in a number sufficient to identify:

4.5.1.5.1 The occurrence and characteristics of the water table aquifer.

4.5.1.5.2 Ground water flow directions.

4.5.1.5.3 Ambient ground water quality.

4.5.1.5.4 Potential pathways of contaminants to points of ground water discharge.

This investigation and report shall be signed by a Professional Geologist registered in Delaware.

4.5.1.6 An environmental assessment.

The environmental assessment shall provide a detailed analysis of the potential impact of the proposed facility on the environment. Factors to be considered include:

Air quality
Water quality
<u>Stream flow</u>
<u>Fish and wildlife</u>
<u>Plants</u>
<u>Threatened or endangered species</u>
Water uses
Land use
<u>Aesthetics</u>
Soil quality
Traffic
Public health and safety
Cultural, recreational, and natural areas
Historic sites
Social and economic factors.
<u>Soil Quality</u>

If the applicant or the Department determines that the proposed facility may cause a threat to human health or the environment, the applicant must provide a written explanation of how he or she plans to mitigate the potential harm.

4.5.1.7 Topographical and site maps

This shall include a topographical map or series of maps on a scale satisfactory to the Department but in no case less than one inch equal to 400 feet, showing topographic elevations surveyed with reference to mean sea level, and any necessary narrative descriptions, including but not limited to the following:

4.5.1.7.1 The legal boundaries of the property as determined by a survey performed by a surveyor registered in Delaware; the names of the present owners of the proposed site and of all adjacent lands; and a description of all title, deed, or usage restrictions and all easements affecting the proposed permit area.

4.5.1.7.2 The boundaries of land where solid waste will be stored at any time over the estimated total life of the proposed operation.

4.5.1.7.3 The locations and names of all water supply wells or surface water intakes within 1/4 mile of the handling site boundaries.

<u>4.5.1.7.4 Proximity to airport runways.</u>

4.5.1.8 Proof that all applicable zoning approvals have been obtained and that application has been made for all other appropriate federal, state, and local environmental permits.

4.5.1.9 A conceptual closure plan. This shall address the items listed in Section 10.6.3 to the extent possible at the time of initial permit application and shall be revised and updated as necessary to reflect changes in plans that will affect the cost of closure.

4.5.1.10 Proof of financial responsibility for closure, as described in Section 4.1.11.2.

4.5.1.11 Proof that the facility meets the siting criteria required by Section 10.2.

4.5.1.12 Any other related reports, data, maps, or information that the Department reasonably requires.

4.5.2 Construction and operation

4.5.2.1 The applicant shall not commence construction of a new transfer station or operate an existing transfer station until the applicant has received a permit from the Department in accordance with these regulations.

4.5.2.2 After the construction of a new transfer station has been completed, and prior to the receipt of solid waste, the permittee shall submit a final report for the Department's approval. The final report shall certify that the construction of the transfer station was completed in accordance with the permit requirements. The final report shall be certified correct by a Professional Engineer registered in Delaware. The permittee shall not commence operations, store or receive solid waste until the Department has provided its written notification that the construction and the final report meet the requirements of the permit and the Delaware Regulations Governing Solid Waste.

4.6 Application Procedures For ~~Facility For~~ Infectious Waste Management Facility

4.6.1 Application

Any person desiring to construct or operate an infectious waste management facility must submit a letter of intent to the Department. The letter should indicate the projected design and usage of the proposed facility. The letter of intent shall be followed by submission, by the applicant, of the following additional information:

4.6.1.1 A Solid Waste Management Facility Application, provided by the Department. All information provided by the applicant is certified to be true, accurate, and complete by the applicant's signature on the provided application.

4.6.1.2 Proof of ownership of the property. If the applicant does not own the property, a copy of the lease agreement and the owner's permission to conduct the proposed activity on the property must also be submitted.

4.6.1.3 A plan of operation. This plan shall include the following:

4.6.1.3.1 The source(s) of the infectious waste (generator names and locations);

4.6.1.3.2 A description of the origin and content of the waste, its containerization and the expected volume and frequency of waste disposal at the facility;

4.6.1.3.3 A description of the facility where the waste will be rendered non-infectious, including the name and the exact location of the facility;

4.6.1.3.4 A narrative explaining the methods and schedule for operation, modification, use, and maintenance of the various components of the facility;

4.6.1.3.5 A description of the processing methods to be used for each type of waste, including schematic drawings (e.g., blueprints, etc.);

4.6.1.3.6 A description showing that the facility has developed a validation program which demonstrates the effectiveness of the treatment method by performing an Initial Efficacy Test and Periodic Verification Test(s).

4.6.1.3.7 A description of the measures that will be used to ensure that unauthorized and unwanted wastes are prevented from entering the facility;

4.6.1.3.8 A description of the containers to be used for the storage during the collection and during the movement within the facility, including the total length of time of storage;

4.6.1.3.9 A description of the alternatives to be used if the processing equipment is inoperable, and the procedures to be used for the management of the waste if it cannot be promptly processed;

4.6.1.3.10 A description of the handling and safety measures that will be employed for each type of waste, including personal protection and safety as well as modifications to the operational safety plan that are required;

4.6.1.3.11 A description of the proposed methods for controlling noise, litter, odors, vectors, dust, fires, and explosions;

4.6.1.3.12 A contingency plan to be implemented in case of emergency. In addition, if the proposed facility is an incinerator, the Plan of Operation shall include a plan for sampling, analysis, and disposition of the ash generated in the incinerator. The plan shall include a strategy for ash testing during the test burn phase of construction. Testing shall be in accordance with Delaware's Regulations Governing Hazardous Waste. The plan also shall include a strategy for treating and/or disposing of the ash if it is found to exhibit hazardous waste characteristics. A sanitary landfill in Delaware will not be considered an acceptable disposal facility for ash that exhibits hazardous waste characteristics.

4.6.1.4 An engineering report. This report shall be prepared and signed by a Professional Engineer registered in Delaware and shall include the following:

4.6.1.4.1 Descriptions and specifications of all proposed design features.

4.6.1.4.2 A description of the proposed installation methods and construction procedures.

4.6.1.4.3 A schedule of events for construction of the facility, if deemed necessary by the Department.

4.6.1.4.4 Proposed design capacity in both tons and cubic yards per day, and life expectancy of the facility.

4.6.1.4.5 Materials and energy balance of the facility.

4.6.1.5 A hydrogeological assessment, if deemed necessary by the Department.

A hydrogeological investigation may be required at the proposed site and approved by the Department before a construction permit will be issued. This investigation shall include a series of test borings and wells, constructed to a depth and in a number sufficient to identify:

4.6.1.5.1 The occurrence and characteristics of the unconfined and first confined aquifers,

4.6.1.5.2 Ground water flow directions,

4.6.1.5.3 Ambient ground water quality,

4.6.1.5.4 Potential pathways of contaminants to points of ground water discharge.

In addition, an evaluation shall be made of the elevation of the seasonal high water table.

This investigation and report shall be signed by a Professional Geologist registered in Delaware.

4.6.1.6 An environmental assessment

An environmental assessment shall be performed to provide a detailed analysis of the potential impact of the proposed facility on the environment. Factors to be considered include:

Air quality
Water quality
Stream flow
Fish and wildlife
Plants
Threatened or endangered species
Water uses
Land use
Aesthetics
Traffic
Public health and safety

Cultural, recreational, and natural areas
Historic sites
Social and economic factors.
Soil Quality

If the applicant or the Department determines that the proposed facility may cause a threat to human health or the environment, the applicant must provide a written explanation of how he or she plans to mitigate the potential harm.

4.6.1.7 Topographical and site location maps, if deemed necessary by the Department.

This shall include a topographical map or series of maps on a scale satisfactory to the Department but in no case less than one inch equal to 400 feet, showing topographic elevations surveyed with reference to mean sea level, and any necessary narrative descriptions, including but not limited to the following:

4.6.1.7.1 The legal boundaries of the property as determined by a survey performed by a registered surveyor; the names of the present owners of the proposed site and of all adjacent lands; and a description of all title, deed, or usage restrictions affecting the proposed permit area.

4.6.1.7.2 The boundaries of the facility over the estimated total life of the proposed operation, including the boundaries of land that will be affected in each sequence of disposal activity.

4.6.1.7.3 The boundaries of land where solid waste will be stored at any time over the estimated total life of the proposed operation.

4.6.1.7.4 The locations and names of all water supply wells or surface water intakes within 1/4 mile of the disposal site boundaries.

4.6.1.8 Proof that all applicable zoning approvals and all appropriate federal, state, and local environmental permits have been obtained.

4.6.1.9 Closure plan that conforms with Section 11.8, as appropriate.

4.6.1.10 Proof of financial responsibility for closure as described in Section 4.1.11.2 and 4.1.11.4.

4.6.1.11 Proof that the facility meets the siting criteria required by Section 11, Part 1,B.

4.6.1.12 Any other related reports, data, maps, or information that the Department requires.

4.6.2 Construction and operation

4.6.2.1 The applicant shall not commence construction of a new infectious waste facility or operate an existing infectious waste facility until the applicant has received a permit from the Department in accordance with these regulations.

4.6.2.2 After the construction of a new infectious waste facility has been completed, and prior to the receipt of solid waste or materials for processing, the permittee shall submit a final report for the Department's approval. The final report shall certify that the construction of the facility was completed in accordance with the engineering report. The permittee shall not commence operations or store or receive solid waste or materials to be processed until the Department has provided its written notification that the construction and the final report meet the requirements of the permit and the Delaware Regulations Governing Solid Waste.

4.6.3 Closure

Any person wishing to close an infectious waste facility must submit the following to the Department:

4.6.3.1 Notification of intent to close.

4.6.3.2 A detailed plan for closing the facility so as to achieve the objectives described in Section 11.10.

4.6.3.3 If the Department approves the closure plan, it will modify the facility's permit to allow closure to take place.

4.7 Application Procedures For Solid Waste Transporters

Any person required to obtain a permit to transport solid waste must submit a completed application to the Department. The application shall be accompanied by all applicable supporting documentation and appropriate application fees as required by these regulations. All information provided by the applicant shall be certified to be true, accurate, and complete by the applicant's signature on the provided application.

8 DE Reg. 354 (8/1/04)

5.0 Sanitary Landfills

(NOTE: This section applies only to landfills that accept household waste.)

5.1 SITING

5.1.1 Sanitary landfill facilities shall be located only in areas where the potential for degradation of the quality of air, land, and water is minimal.

5.1.2 All sanitary landfill facilities shall be constructed to at least minimum design requirements as contained in Section 5.2. More stringent designs will be required where deemed necessary by the Department for the protection of ground water resources.

5.1.3 The owner or operator of any proposed sanitary landfill within a 5 mile radius of any airport runway must notify the airport and the Federal Aviation Administration (and provide proof of notification to the Department).

5.1.4 No new cell of a sanitary landfill shall be located:

5.1.4.1 Within the 100-year flood plain as delineated by the Federal Emergency Management Agency.

5.1.4.2 In an area that may cause or contribute to the degradation of any state or federally regulated wetlands unless the owner or operator can demonstrate to the satisfaction of the appropriate wetlands regulatory agency that:

5.1.4.2.1 there is no impact to any regulated wetlands on the site, or

5.1.4.2.2 any impact will be mitigated as required.

5.1.4.3 Within one mile of any state or federal wildlife refuge, wildlife area, or park, unless specifically exempted from this requirement by the Department.

5.1.4.4 Within 10,000 feet of any airport runway currently used by turbojet aircraft or 5,000 feet of any airport runway currently used by piston-type aircraft, unless a waiver is granted by the Federal Aviation Administration.

5.1.4.5 So as to be in conflict with any locally adopted land use plan or zoning requirement.

5.1.4.6 Within the wellhead protection area of a public water supply well or well field or a formally designated aquifer resource protection area.

5.1.4.7 Within 200 feet of a fault that has had displacement during Holocene time (unless it can be demonstrated that a lesser setback distance would prevent damage to the structural integrity of the landfill unit and be protective of human health and the environment.)

5.1.4.8 Within a seismic impact zone unless it can be demonstrated that all containment structures, including liners, leachate collection systems and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.

For the purposes of this section:

5.1.4.8.1 Seismic impact zone means an area with a ten percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10g in 250 years.

5.1.4.8.2 Maximum horizontal acceleration in lithified earth material means the maximum expected horizontal acceleration depicted on a seismic hazard map, with a 90 percent or greater probability that the acceleration will not be exceeded in 250 years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment.

5.1.4.8.3 Lithified earth material means all rock, including all naturally occurring and naturally formed aggregates or masses of minerals or small particles of older rock that formed by crystallization of magma or by induration of loose sediments. This term does not include man-made materials, such as fill, concrete and asphalt or unconsolidated earth materials, soil or regolith lying at or near the earth surface.

5.1.4.9 In unstable areas, unless engineering measures have been incorporated in the design to insure the integrity of the structural components of the waste facility (including liners, leachate collection systems, run-on/runoff control, capping and anything affecting the containment and/or possible release of contaminants.) Unstable areas include those of (1) poor foundation conditions (possible subsidence), (2) susceptibility to mass movement or (3) Karst terrane.

5.1.4.10 In areas where valuable aquifers would be threatened by contaminant releases, unless viable alternatives have been dismissed and stringent design measures have been incorporated to minimize the possibility and magnitude of releases.

5.1.4.11 Within 200 feet of the facility property boundary unless otherwise approved by the Department.

5.2 Design

5.2.1 General

Sanitary landfills shall be planned and designed by a Professional Engineer registered in Delaware. Planning and design of these facilities shall be consistent with the declared purpose and intent and in accordance with the provisions of this regulation and based on empirically derived data and state of the art technology.

5.2.2 Minimum design requirements

5.2.2.1 All sanitary landfills shall be designed to minimize contaminant releases and to prevent significant adverse impacts on human health or the environment and to achieve the following performance standards:-

5.2.2.1.1 Ensure that the contaminant concentrations do not prevent appropriate use of the ground water in the uppermost aquifer at the relevant point of compliance (examples are water supply, potability, stream flow maintenance, etc., as appropriate).

5.2.2.1.1.1 The point of compliance shall be specified by the Department and shall be no more than 150 meters from the landfill cell boundary and shall be located on property owned by the owner of the landfill.

5.2.2.1.1.2 In determining the relevant point of compliance, the Department shall consider at least the following factors:

5.2.2.1.1.2.1 The hydrogeologic characteristics of the landfill and surrounding land;

5.2.2.1.1.2.2 The volume and physical and chemical characteristics of the leachate;

5.2.2.1.1.2.3 The quantity, quality, availability and direction of flow of ground water;

5.2.2.1.1.2.4 The proximity and withdrawal rate of ground water users;

5.2.2.1.1.2.5 The availability of alternate drinking water supplies;

5.2.2.1.1.2.6 The existing quality of ground water, including other sources of contamination and their cumulative impacts on ground water, and whether the ground water is currently used or reasonably expected to be used for drinking water;

5.2.2.1.1.2.7 Public health, safety and welfare effects; and

5.2.2.1.1.2.8 Practical capability of the landfill owner or operator.

5.2.2.1.2 Ensure that surface water quality standards will not be violated (except within designated mixing zones) as a result of contaminant discharges from the landfill.

5.2.2.2 All sanitary landfills shall be designed to have:

5.2.2.2.1 A liner and internal leachate collection system which meet the requirements of Sections 5.3 and 5.4 of these regulations respectively,

5.2.2.2.2 A setback area, including a buffer zone with appropriate screening,

5.2.2.2.3 A gas control system that meets the requirements of Section 5.5,

5.2.2.2.4 A surface water management system that meets the requirements of Section 5.6,

5.2.2.2.5 A ground water monitoring system that meets the requirements of Section 5.7, and

5.2.2.2.6 A capping system that meets the requirements of Section 5.8.

5.3 Liner

5.3.1 General provisions

5.3.1.1 An impermeable liner shall be provided at every sanitary landfill to restrict the migration of leachate from the landfill and to prevent contamination of the underlying ground water.

5.3.1.2 The Department reserves the right to set a more stringent liner requirement when it determines that a composite liner is not sufficient to protect human health and the environment.

5.3.1.3 The bottom of the liner (or the secondary liner, in a double liner system) shall be at least five (5) feet above the seasonal high water table as measured in the uppermost aquifer beneath the landfill. This 5-foot requirement may be reduced for a more stringent liner system design which provides enhanced protection of ground water.

5.3.1.4 All liners shall be prepared, constructed, and installed in accordance with a quality assurance plan included in the engineering report [4.2.1.4] and approved by the Department. For synthetic liners, the plan shall incorporate the manufacturer's recommendations.

5.3.1.5 Qualifications of the construction quality assurance staff (CQA) and the geosynthetics installer, including master seamers, on-site supervisor, and construction quality control (CQC) personnel, shall meet the requirements of the approved Quality Assurance plan and be submitted to the Department for review prior to their performing these duties on site.

5.3.1.6 All conformance and destructive samples taken as part of the construction quality assurance plan shall be tested at an independent laboratory which is accredited by the Geosynthetics Institute’s Laboratory Accreditation Program (by applicable test method) or other accreditation program acceptable to the Department.

5.3.2 Liner characteristics

5.3.2.1 Composite liner

A composite liner must have, as a minimum:

5.3.2.1.1 A primary (upper) liner which meets the following:

5.3.2.1.1.1 Is at least 45 mils thick.

5.3.2.1.1.2 Is constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to physical contact with the leachate to which it is exposed, climatic conditions, the stresses of installation, and the stresses of daily operation.

5.3.2.1.1.3 Is made of synthetic material that meets minimum requirements of the National Sanitation Foundation's publication, "Standard Number 54-1993, Flexible Membrane Liners" for membrane materials covered by this standard, or of other materials of equal or better performance as approved by the Department.

5.3.2.1.1.4 Is chemically resistant to the waste and leachate managed at the facility. The EPA Test Method 9090 shall be performed using a solid waste leachate (a synthetic

leachate mix approved by the Department may be substituted if existing leachate is not available). The specified physical parameters shall be tested before and after liner exposure. Any significant change in test properties shall be considered to be indicative of incompatibility.

5.3.2.1.1.5 Is compounded from first quality virgin materials. No reground or reprocessed materials containing encapsulated scrim shall be used in the manufacturing of the liner.

5.3.2.1.1.6 Is free of pinholes, blisters, holes, and contaminants, which include, but are not limited to, wood, paper, metal and nondispersed ingredients.

5.3.2.1.2 A secondary (lower) liner composed of:

Compacted clay at least two feet thick with a hydraulic conductivity no greater than 1×10^{-7} cm/sec, or

An equivalent material or combination of materials acceptable to the Department.

5.3.2.2 Natural liner

5.3.2.2.1 Use of natural material for liners is restricted to those areas where:

5.3.2.2.1.1 Underlying ground water is not used and is not reasonably expected to be used for water supplies, and

5.3.2.2.1.2 The landfill subbase is subject to compaction and settlement such that a synthetic membrane would not be feasible.

5.3.2.2.2 A natural liner must meet the following requirements as a minimum:

5.3.2.2.2.1 It shall consist of compacted clay or equivalent material having a hydraulic conductivity no greater than 1×10^{7} cm/sec.

5.3.2.2.2.2 The material shall be at least five (5) feet thick, and thicker if necessary to prevent any leachate from migrating through the liner at any time during the active life and through the postclosure care period of the facility.

5.3.2.2.2.3 The material proposed for use shall be tested by ASTM or equivalent methods for the following:

Grain size
Classification
Compaction
Specific gravity
Hydraulic conductivity
Porosity
pH
Cation exchange capacity
Pinhole test (if required)
Mineralogy (if required)

All data shall be submitted to the Department prior to construction.

5.3.2.2.2.4 Testing of the saturated hydraulic conductivity and the effect of leachate on soil hydraulic conductivity shall be performed in accordance with test methods described in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods”, EPA Publication SW-846 [Third Edition (November 1986), as amended by Updates I (dated July 1992), II (dated September 1994), IIA (dated August 1993), IIB (dated January 1995), III (dated December 1996), and IIIA (dated April 1998)], or other tests approved in writing by the Department.

5.3.2.2.2.5 If onsite soils are to be used as a natural liner, the uppermost five (5) feet of soil shall be excavated and recompacted to ensure homogeneity of the liner, provided,

however, that with respect to dredge spoil soils, the excavation and recompaction requirement shall not apply if the applicant can demonstrate that the dredge spoil soils have acceptable characteristics as indicated above.

5.3.2.3 Double liner system

5.3.2.3.1 A double liner system shall meet the following requirements:

5.3.2.3.1.1 It shall consist of two single liners separated by a drainage layer containing a leak detection system.

5.3.2.3.1.2 The primary (upper) liner shall be a synthetic liner which is at least 30 mils thick and which meets the requirements of Section 5.3.2.1.1.2 through 5.3.2.1.1.6.

5.3.2.3.1.3 The secondary (lower) liner may be either synthetic or natural. If synthetic, it must be at least 30 mils thick and must meet the requirements of Section 5.3.2.1.1.2.6. If natural, it must meet the requirements of Section 5.3.2.2.

5.3.2.3.1.4 The drainage layer separating the two liners shall consist of at least 12 inches of soil having a hydraulic conductivity greater than 1 x 10^2 cm/sec based on laboratory and field testing.

Alternate material may be used for the drainage layer with prior written approval of the Department.

5.3.2.3.1.5 The leak detection system shall be capable of detecting and intercepting liquid within the drainage layer and conveying the liquid to a collection sump or monitoring point where the quantity of flow can be measured and the liquid can be sampled. The operator or designer shall calculate the Action Leakage Rate. The proposed Action Leakage Rate and a response plan if the Action Leakage Rate is exceeded shall be submitted to the Department as part of the application package. The system shall be designed to operate without clogging through the postclosure care period of the facility.

Alternate liner designs may be used with prior written approval of the Department.

5.3.2.3.1.6 The upper synthetic liner membrane shall be underlain by either a geosynthetic clay or 2 feet of natural material with a permeability no greater than 10^7 cm/sec.

5.3.2.3.2 A double liner system will be required where landfills are underlain by aquifers which are reasonably expected sources of water supply and/or capable of significant contaminant transport to adjacent surface waters.

5.3.3 Liner construction

5.3.3.1 Construction/installation of composite liner

5.3.3.1.1 At least 15 working days prior to installation of the liner, the owner or operator shall notify the Department of the installation date.

5.3.3.1.2 The liner shall be installed upon a subbase which meets the following requirements:

5.3.3.1.2.1 It shall be capable of supporting the loads and withstanding the stresses that will be imposed on it through the active life and postclosure care period of the facility and of resisting the pressure gradient above and below the liner caused by settlement, compression, or uplift.

5.3.3.1.2.2 It shall have a smooth surface that is free of all rocks, stones, roots, sharp objects, or debris of any kind.

5.3.3.1.2.3 It shall be certified in writing by the liner installer as an acceptable subbase for the liner. Written certification of acceptability shall be submitted to the Department prior to installation of the liner. However, submittal of written acceptance may proceed incrementally according to installation schedule.

5.3.3.1.3 The minimum post-loading slopes of the liner shall either be:

5.3.3.1.3.1 two (2) percent on controlling slopes and one-half (0.5) percent on remaining slopes, OR

5.3.3.1.3.2 the controlling and remaining slopes shall be designed to prevent the head on the liner, excluding sump areas, from exceeding a depth of twelve (12) inches including post settlement conditions.

5.3.3.1.4 The landfill shall be designed to minimize penetrations through the liner. If a penetration is essential, a liquid-tight seal must be accomplished between the penetrating structure and the synthetic membrane. Compaction of areas adjacent to the penetrating structure shall be to the same density as the surrounding soil to minimize differential settlement. Sharp edges on the penetrating structure must not come in contact with the synthetic material.

5.3.3.1.5 Bridging or stressed conditions in the liner shall be avoided with proper slack allowances for shrinkage of the liner during installation and before the placement of a protective soil layer.

5.3.3.1.6 Synthetic liners shall have factory and field seams that equal or exceed the strength requirements defined by the National Sanitation Foundation's "Standard Number 54-1993" for that liner material. All seams must be visually inspected and tested along their entire length for seam continuity using suitable nondestructive techniques. Seams shall also be tested for strength, at a frequency specified in the quality assurance plan. In addition, field seams shall meet the following requirements:

5.3.3.1.6.1 Field seaming shall provide a dry sealing surface.

5.3.3.1.6.2 Seaming shall not be done when wind conditions prevail.

5.3.3.1.6.3 Seams shall be made and bonded in accordance with the supplier's recommended procedures.

5.3.3.1.7 Proper equipment shall be used in placing drainage material over the synthetic liner to avoid stress.

5.3.3.1.8 The synthetic membrane shall be protected from the waste by at least two (2) feet of drainage material incorporating the leachate collection system.

5.3.3.1.9 The synthetic membrane must be underlain by a secondary liner as described in Section 5.3.2.1.2.

5.3.3.2 Construction of natural liner

5.3.3.2.1 All lenses, cracks, channels, root holes, or other structural non-uniformities that can increase the saturated hydraulic conductivity above 1×10^{7} cm/sec shall be removed.

5.3.3.2.2 Natural liners shall be constructed in lifts not exceeding six (6) inches after compaction to maximize the effectiveness of the compaction throughout the lift thickness. Each lift shall be properly interfaced by scarification between lifts to ensure the bonding.

5.3.3.2.3 Clods shall be broken up and the material shall be homogenized before compaction of each lift using mixing devices such as pug mills or rotary tillers.

5.3.3.2.4 The maximum slope of the sidewalls shall not be so great as to preclude effective compaction.

5.3.3.3 Construction/installation of double liner

5.3.3.3.1 The secondary liner shall be constructed in accordance with Section 5.3.3.2 (if it is a natural liner) or Section 5.3.3.1.1.7 (if it is synthetic).

5.3.3.3.2 The primary liner shall be constructed in accordance with Section 5.3.3.1.1 and 5.3.3.1.3.8.

5.4 Leachate Collection, Treatment, Disposal, And Monitoring

5.4.1 General provisions

5.4.1.1 All sanitary landfills shall be designed and constructed to include a leachate collection system, a leachate treatment and disposal system, and a leachate monitoring system.

5.4.1.2 The leachate systems shall be constructed, installed, and maintained in accordance with a Department approved quality assurance plan.

5.4.1.3 The owner or operator shall keep and maintain documentation for the quality assurance procedures through the postclosure care period of the facility.

5.4.2 Leachate collection

5.4.2.1 Minimum design specifications

5.4.2.1.1 The leachate collection system shall be designed to operate without clogging through the postclosure care period of the facility.

5.4.2.1.2 All elements of the system (pipes, sumps, pumps, etc.) shall be sized according to water balance calculations and shall be capable of handling peak flows.

5.4.2.1.3 Collection pipes shall be sized and spaced to efficiently remove leachate from the bottom of the waste and the side walls of the cell. The capacity of the mains shall be at least equal to the sum of the capacities of the laterals.

5.4.2.1.4 The pipes shall be designed to withstand the weight, stresses, and disturbances from the overlying wastes, waste cover materials, equipment operation, and vehicular traffic.

5.4.2.1.5 The collection pipes shall be designed to drain by gravity to a sump system. Sumps must function automatically and shall contain a conveyance system for the removal of leachate.

5.4.2.1.6 Manholes or cleanout risers shall be located along the perimeter of the leachate collection system. The number and spacing of the manholes shall be sufficient to insure proper maintenance of the system by water jet flushing or an equivalent method.

5.4.2.1.7 Innovative leachate collection systems incorporating alternative designs may be used, after approval by the Department, if they are shown to be equivalent to or more effective than the specified design.

5.4.2.1.8 The leachate collection system must be designed to prevent the leachate head on the liner from exceeding a depth of 12 inches.

5.4.2.2 Construction standards

5.4.2.2.1 The leachate collection system shall be installed immediately above an impermeable liner and at the bottom of a drainage layer. The drainage layer shall be at least 12 inches thick with a hydraulic conductivity not less than 1×10^{-2} cm/sec and a minimum controlling slope of two (2) percent. Alternate materials may be used for the drainage layer with prior written approval of the Department.

5.4.2.2.2 The following tests shall be performed on the soil proposed for use in the drainage layer, and all data shall be submitted to the Department prior to construction of the drainage layer. These tests shall be performed in accordance with current ASTM, AASHTO, or equivalent methods:

Classification
Porosity
Relative density or compaction
Specific gravity
Hydraulic conductivity

5.4.2.2.3 The leachate collection system and manholes or cleanout risers shall be constructed of materials that can withstand the chemical attack that results from leachates.

5.4.2.3 Operational procedures

5.4.2.3.1 The leachate collection system shall operate automatically, whenever leachate is present in the sump, to remove accumulated leachate.

5.4.2.3.2 Inspections shall be conducted weekly to verify proper functioning of the leachate collection system and to detect the presence of leachate in the removal sump.

The owner or operator shall keep records on the system to provide sufficient information that the leachate collection system is functional and operating properly. The amount of leachate collected from each cell shall be recorded on a weekly basis.

5.4.2.3.3 Collection lines shall be cleaned according to a Department approved scheduled maintenance program and more frequently if required.

5.4.3 Leachate treatment and disposal

The permittee must maintain all necessary permits and approvals for leachate storage and discharge activities.

5.4.3.1 The leachate treatment and disposal system shall be designed in accordance with one of the following options:

5.4.3.1.1 Complete treatment onsite with or without direct discharge to surface water,

5.4.3.1.2 Pretreatment onsite with discharge to an offsite treatment works for final treatment,

5.4.3.1.3 Storage onsite with discharge to an offsite treatment works for complete treatment,

5.4.3.1.4 Direct discharge to an offsite treatment works, or

5.4.3.1.5 Pretreatment on site with discharge on site.

5.4.3.2 Leachate storage prior to treatment shall be within tanks constructed and installed in accordance with the following standards:

5.4.3.2.1 The tank shall be placed above ground.

5.4.3.2.2 The storage tank shall be designed in accordance with American Petroleum Institute (API), Underwriters Laboratory (UL), or an equivalent standard appropriate to the material being used, and shall be constructed of or lined with material which has a demonstrated chemical resistance to the leachate.

5.4.3.2.3 The storage tank area shall have a liner capable of preventing any leachate which may escape from the tank from coming into contact with the underlying soil.

5.4.3.2.4 The storage tank area shall be surrounded by a berm, and the bermed area shall have a capacity at least ten percent greater than the capacity of the tank.

5.4.3.2.5 All storage tanks shall be equipped with a venting system.

5.4.3.2.6 All storage tanks shall be equipped with a high liquid level alarm or warning device. The alarm system shall be wired to the location where assistance will be available to respond to the emergency.

5.4.3.3 Onsite complete treatment or pretreatment facilities shall be designed and constructed in accordance with the following:

5.4.3.3.1 The onsite treatment unit shall be designed based on the results of a treatability study, the results of the operations of a pilot plant, or written information documenting the performance of an equivalent leachate treatment system.

5.4.3.3.2 Onsite treatment units shall be designed and constructed by staging of the units to allow for online modification of the treatment system to account for variability of the leachate quality and quantity.

5.4.3.4 For all leachate discharges planned for publicly owned treatment works (POTW), the owner or operator of the landfill shall notify the receiving POTW of intent to discharge leachate into the collection system and shall provide the POTW with analysis of the leachate as required by the POTW.

5.4.3.5 All leachate treatment and disposal systems shall be designed and constructed to control odors.

5.4.3.6 Residuals from the onsite treatment and disposal systems shall be sampled and analyzed for hazardous waste characteristics in accordance with the Delaware Regulations Governing Hazardous Waste.

5.4.3.7 Recirculation of leachate may be allowed, subject to approval by the Department, to accelerate decomposition of the waste. At new facilities and expansions of existing facilities, recirculation will be allowed only in areas constructed with a composite liner system or a double liner system. The method of recirculation at all facilities must be approved by the Department in advance and annually so long as the recirculation continues. Records of leachate collected and recirculated must be kept and reported and any resultant problems reported to the Department and remedied as soon as practicable and included in the annual report.

5.4.4 Leachate monitoring

5.4.4.1 The leachate monitoring system shall be capable of measuring the quantity of the flow and sampling the leachate from each landfill cell. The volume of leachate collected from each cell shall be determined at least monthly and reported quarterly.

5.4.4.2 Leachate monitoring shall be performed according to a Department approved plan which includes quality control and quality assurance procedures.

5.4.4.3 In addition to the requirement in Section 5.4.4.2 above, samples of leachate shall be collected and analyzed from each waste cell as follows:

5.4.4.3.1 monthly, during the active life of a cell, and at an interval specified by the Department after closure of the cell, for the following parameters:

pH
Alkalinity (Alk)
Chemical Oxygen Demand (COD)
Biochemical Oxygen Demand (BOD)
Total Organic Carbon (TOC)
Specific Conductance (SpC)
Total Dissolved Solids (TDS)
Total Iron (Fe)
Total Manganese (Mn)
Chloride (C1)
Nitrate (NO_3-N), Nitrate (NO_2-N),
and Ammonia (NH_3-N)
Sulfate (SO_4), and

5.4.4.3.2 at an interval specified by the Department for additional parameters specified by the Department.

5.4.4.4 Leachate monitoring results shall be submitted to the Department as part of the annual monitoring report or more frequently as directed by the Department.

5.4.4.5 For a double liner system, if the Action Leakage Rate of the leak detection system is exceeded, the owner or operator of the landfill shall notify the Department within five (5) working days. The owner or operator shall also sample and analyze the liquid in the leak detection system for the same parameters listed in Section 5.4.4.3.1 and any additional parameters as required by the Department.

5.5 Gas Control

5.5.1 General provisions

5.5.1.1 Gas control system shall be installed at all sanitary landfills.

5.5.1.2 The gas control system shall be designed and constructed to:

5.5.1.2.1 Evacuate gas from within the waste to prevent the accumulation of gas on-site or off-site.

5.5.1.2.2 Prevent and control damage to vegetation.

5.5.1.2.3 Prevent odors from the facility being detectable at the facility property line in sufficient quantities to cause or create a condition of air pollution.

5.5.1.3 The concentration of landfill gas in facility structures (except gas recovery system components) and at the facility boundary shall not exceed 25% of the Lower Explosive Limit (LEL).

5.5.2 Design and construction standards

5.5.2.1 The owner or operator of a sanitary landfill shall consider both active and passive gas control systems and shall provide an evaluation of the proposed system for Department approval.

5.5.2.2 The owner or operator shall perform an analysis to establish the required spacing of gas control vents to provide an effective system.

5.5.2.3 The gas control system shall be designed to evacuate gas from all levels within the waste.

5.5.2.4 The system shall not interfere with or cause failure of the liner or leachate systems.

5.5.3 Monitoring

5.5.3.1 A sufficient number of gas monitoring wells shall be installed to evaluate gas production rates in the landfill.

5.5.3.2 The owner or operator shall sample the gas monitoring wells at least quarterly and provide analytical results [as required by conditions specified in the facility permit] as part of the annual report.

5.5.3.3 At sanitary landfills utilizing natural liners, gas monitoring probes must be installed in the soil outside the lined area to evaluate any lateral migration of landfill gas.

5.5.3.4 Emissions from active and passive gas control systems may require a permit from the Air Resources Section of the Division of Air and Waste Management.

5.5.4. Response Actions

5.5.4.1 If methane gas levels exceeding the limits specified in Section 5.5.1.3 are detected, the owner or operator must:

5.5.4.1.1 Immediately take all necessary steps to ensure protection of human health and notify the Department.

5.5.4.1.2 Within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health.

5.5.4.1.3 Within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the Department that the plan has been implemented. The plan shall describe the nature and extent of the problem and the proposed remedy.

5.5.4.2 For purposes of this section, lower explosive limit means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25 degrees C and atmospheric pressure.

5.6 Surface Water Management

5.6.1 General provision

An owner or operator of a sanitary landfill shall design, construct, and maintain a surface water management system to:

5.6.1.1 Prevent erosion of the waste and cover,

5.6.1.2 Prevent the collection of standing water, and

5.6.1.3 Minimize surface water runoff onto and into the waste.

5.6.2 Design requirements

An owner or operator of a sanitary landfill shall include:

5.6.2.1 A run-on control system to prevent flow onto the active portion of the landfill during the peak discharge from a 24hour, 25year storm.

5.6.2.2 A runoff control system from the active portion of the landfill to collect and control at least the water volume resulting from a 24hour, 25year storm. The system shall be designed to include:

5.6.2.2.1 Detention basins to provide temporary storage of the expected runoff from the design storm with sufficient reserve capacity to contain accumulated precipitation and sediment prior to discharge.

5.6.2.2.2 Diversion structures designed to prevent runoff generated within the active areas from moving off site of the lined areas.

5.6.3 Channeling of runoff

5.6.3.1 Runoff from the active areas within the active cell(s) must be channeled to the leachate treatment and disposal system.

5.6.3.2 Runoff from the unused portion of the active cell(s) that has not been in contact with waste shall be channeled to the detention basins or other approved sedimentation control devices.

5.6.3.3 Until vegetative cover has been established, runoff from closed cells will be directed to the detention basins or other approved sedimentation control devices.

5.6.4 Discharge

Discharge from the detention basins shall be in compliance with all applicable federal and state regulations.

5.7 Ground Water Monitoring And Corrective Action

5.7.1 General provision

Owners or operators of all sanitary landfill facilities shall install maintain and operate a ground water monitoring program to evaluate facility impact upon ground water quality.

5.7.2 Design and construction of monitoring system

5.7.2.1 The ground water monitoring system shall be designed by, constructed under the direction of, and attested to by, a Professional Geologist registered in Delaware.

5.7.2.2 The system shall consist of a sufficient number of wells, installed at appropriate locations and depths, to define the ground water flow system and shall be developed in accordance with Departmental requirements to yield ground water samples that are representative of the aquifer water quality, both unaffected by (background) and potentially impacted by downgradient contaminant leakage from the facility. The downgradient monitor wells (which are points of compliance for ground water performance standards) must be no further than 150 meters from the edge of the sanitary landfill cell, and on the waste facility property.

5.7.2.3 The number, spacing, location, depth, and screened interval of the monitoring wells shall be approved by the Department prior to installation.

5.7.2.4 All monitoring wells shall be constructed in accordance with the Regulations Governing the Construction of Water Wells and any subsequently approved guidelines. Variation from the existing guidelines must be approved by the Department in writing prior to construction.

5.7.2.5 Monitoring of surface water, into which ground water flowing from beneath the landfill discharges, may also be required as part of the ground water monitoring program. Parameter analysis may include all those required for the ground water sampling plus any additional parameters or tests the Department deems necessary.

5.7.3 Ground water sampling and analyses

5.7.3.1 The owner or operator shall submit a ground water sampling plan to the Department at the time of permit application. The sampling plan must include procedures and techniques for:

5.7.3.1.1 Sample collection, preservation, and transport

5.7.3.1.1.1 Samples will be collected at low flow rates (<1 l/min) to minimize turbidity of the samples.

5.7.3.1.1.2 Samples will be field filtered only when turbidity exceeds 10 NTU. Repeated sampling of any well where turbidity exceeds 10 NTU is not permitted without Department approval. Approval will only be granted in cases where turbidity cannot be controlled by careful well construction, development and sampling.

5.7.3.1.2 Analytical procedures and quality assurance, and

5.7.3.1.3 Chain of custody control

5.7.3.2 Sample parameters

5.7.3.2.1 Water levels will be measured prior to sample collection

5.7.3.2.2 Ground water samples will be analyzed for the following list of parameters:

pH
Alkalinity (Alk)
Chemical Oxygen Demand (COD)
Total Organic Carbon (TOC)

Specific Conductance (SpC)
Total Dissolved Solids (TDS)
Iron (Fe)
Manganese (Mn)
Chloride (C1)
Nitrate (NO_3N) and Ammonia (NH_3N)
Sulfate (SO_4)
Dissolved Oxygen (DO)
Oxidation Reduction Potential (ORP) or Eh

The parameters listed in Table I when requested by the Department.

Any additional parameters specified by the Department.

The Department may delete the requirement for any constituents where appropriate. Such deletions will be based on:

5.7.3.2.2.1 The results of leachate monitoring (constituent is not a significant constituent of the leachate),

5.7.3.2.2.2 Local geochemical considerations (immobility in subsurface), and

5.7.3.2.2.3 Other relevant factors.

Table 1

Antimony	trans-1,4-Dichloro-2-butene
Arsenic	1,1-Dichloroethane; Ethylidene chloride
Barium	1,2-Dichloroethane; Ethylene dichloride
Beryllium	1,1-Dichloroethylene; 1,1-Dichloroethene
Cadmium	cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene
Chromium	trans-1,2-Dichloroethylene
Cobalt	1,2-Dichloropropane
Copper	cis-1,3-Dichloropropene
Lead	trans-1,3-Dichloropropene
Nickel	Ethylbenzene
Selenium	2-Hexanone; Methyl butyl ketone
Silver	Methyl bromide; Bromomethane
Thallium	Methyl chloride; Chloromethane
Vanadium	Methylene bromide; Dibromomethane
Zinc	Methylene chloride; Dichloromethane
Acetone	Methyl ethyl ketone; MEK
Acrylonitrile	Methyl iodide; Iodomethane
Benzene	4-Methyl-2-pentanone; Methyl isobutyl ketone

Bromochloromethane	Styrene
Bromodichloromethane	1,1,1,2-Tetrachloroethane
Bromoform; Tribromomethane	1,1,2,2-Tetrachloroethane
Carbon disulfide	Tetrachloroethylene; Tetrachloroethene
Carbon tetrachloride	Toluene
Chlorobenzene	1,1,1-Trichloroethane; Methylchloroform
Chloroethane; Ethyl chloride	1,1,2-Trichloroethane
Chloroform; Trichloromethane	Trichloroethylene
Dibromochloromethane;Chlorodibromomethane	Trichlorofluoromethane; CFC-11
1,2-Dibromo-3-chloropropane; DBCP	1,2,3-Trichloropropane
1,2-Dibromoethane; Ethylene dibromide; EDB	Vinyl acetate
o-Dichlorobenzenze; 1,2-Dichlorobenzene	Vinyl chloride
p-Dichlorobenzenze; 1,4-Dichlorobenzene	Xylenes

5.7.3.2.3 Test methods used to determine the parameters of Section 5.7.3.2.2 shall be those described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA Publication SW-846 [Third Edition (November 1986), as amended by Updates I (dated July 1992), II (dated September 1994), IIA (dated August 1993), IIB (dated January 1995), III (dated December 1996), and IIIA (dated April 1998)], or other tests approved in writing by the Department.

5.7.3.3 Monitoring frequency will be at least semiannual. An alternate frequency may be specified by the Department based on consideration of the following conditions:

5.7.3.3.1 Lithology of the aquifer and unsaturated zone,

5.7.3.3.2 Hydraulic conductivity of the aquifer and unsaturated zone,

5.7.3.3.3 Ground water flow rates,

5.7.3.3.4 Distance and travel time between the waste unit(s) and the downgradient monitor wells and possible points of exposure to any landfill derived contaminants in wells or receiving surface waters, and

5.7.3.3.5 Resource value of the aquifer.

5.7.3.4 The Department may observe the ground water sampling conducted by the permittee or his/her designee and may request split samples for analysis.

5.7.4 Data evaluation

5.7.4.1 The owner or operator must establish the background quality for each sampling parameter or constituent. The background quality is that which would be expected with no impact by contaminant releases from the waste cells.

5.7.4.2 The owner or operator must specify in the operating record the methods to be used for statistical evaluation of the monitoring data. These may include:

5.7.4.2.1 A tolerance or prediction interval procedure in which a range for each constituent is established from the distribution of the background data and the level of each constituent in each compliance (downgradient) monitor well is compared to the upper tolerance or prediction limit,

5.7.4.2.2 A control chart approach that plots concentrations of each constituent versus the background range, or

5.7.4.2.3 Any other statistical method chosen to meet the following requirements and approved by the Department:

5.7.4.2.3.1 Appropriate in distribution and number of available data to meet the requirements of the statistical test chosen;

5.7.4.2.3.2 Capable of limiting individual constituent comparisons to Type I error levels less than 0.01 or multiple constituent comparisons to Type I error levels less than 0.05, for each testing period. (This requirement does not apply to tolerance intervals, prediction intervals, or control charts.)

5.7.4.3 If necessary, the statistical analysis method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

5.7.4.4 The owner or operator must determine whether or not there is a statistically significant increase over background values for each parameter or constituent required in the monitoring program by comparisons using the chosen method of evaluation. This evaluation must be performed within a reasonable period of sampling and analysis normally within 30 days of obtaining sampling results.

5.7.4.5 If any statistically significant increase occurs, the permittee must:

5.7.4.5.1 notify the Department and place the result in the operating record within 14 days, and

5.7.4.5.2 assess the probable accuracy and possible risk associated with the finding in the annual report.

5.7.4.6 Performance standards will be established at each site which are intended to provide adequate protection for human health and the environment. The performance standards may be proposed by the permittee, but must be approved by the Department, and shall be incorporated in the facility permit. In general, performance standards will be the maximum contaminant levels (MCLs) for public drinking water. However, the Department may specify performance levels which are more stringent to protect adjacent surface water (and prevent violation of surface water quality standards) or less stringent (where ground water at the site will not threaten existing or reasonably expected sources of drinking water or cause violation of surface water quality standards) as appropriate.

5.7.4.7 The points of compliance at which performance standards must be met must be no more than 150 meters from the edge of the furthest downgradient waste cell and must be on the waste management facility property.

5.7.4.8 If any release of contaminants from the landfill to the groundwater is detected, either by exceedance of background concentrations or violation of a performance standard in the downgradient wells (points of compliance), the owner or operator must:

5.7.4.8.1 Notify the Department and place the result in the operating record within 14 days,

5.7.4.8.2 Resample to confirm the result and/or demonstrate that the result was an error or that the increase was due to a source other than the permitted waste facility within 90 days,

5.7.4.8.3 Notify the Department of the result of confirmation within 14 days of availability of the result, and

5.7.4.8.4 If a release is confirmed, perform an assessment of corrective measure as described in Section 5.7.6.

5.7.5 Reporting

5.7.5.1 The owner or operator will compile and evaluate all ground water data within a reasonable period of time following sampling and analysis. A tabulation of water elevations and quality will be submitted to the Department within 60 days of each sampling event. Reports of any statistically significant

increases in downgradient wells or violation of performance standards in wells or streams must be reported to the Department within 14 days as noted above.

5.7.5.2 An annual monitoring report must be submitted by the permittee to the Department which includes the following:

5.7.5.2.1 Maps showing the locations of sampling points, water elevations, and ground water flow directions and approximate rates for each sampling period;

5.7.5.2.2 Tabulation of all ground water levels and elevations, leachate volumes collected and treated and leachate and water quality data;

5.7.5.2.3 Presentation of statistical results and graphs depicting water quality parameter concentrations with time;

5.7.5.2.4 Identification of any statistically significant increases in compliance wells and/or exceedances of performance standards;

5.7.5.2.5 Confirmation results and conclusions related to the accuracy of these results and/or reasonable explanation for the results;

5.7.5.2.6 Recommendations for any changes in the monitoring program including changes in the number, location of sampling points, sampling frequency, parameters or procedures;

5.7.5.2.7 An evaluation of the significance of the results including whether they indicate a contaminant release has occurred and any recommendations for corrective measures, if appropriate.

5.7.5.3 In addition to paper copies of reports, the Department may require all or part of any required report to be submitted on machine-readable media in a format mutually acceptable to the Department and the permittee. With the approval of the Department, reports submitted on machine-readable media may be substituted for paper reports.

5.7.6 Assessment of Corrective Measures

5.7.6.1 An assessment (reassessment) of corrective measures by the owner or operator is required (within 90 days) of confirmation of a contaminant release or an exceedance of a performance standard. The owner or operator must perform this assessment which must include:

5.7.6.1.1 Identification of the nature and extent of the release (which may require construction and sampling of additional wells, analysis for additional constituents including those required for leachate, geophysical surveys and/or other measures);

5.7.6.1.2 Reassessment of contaminant fate and potential contaminant receptors (wells and/or receiving streams);

5.7.6.1.3 Evaluation of feasible corrective measures to:

5.7.6.1.3.1 Prevent exposure to potentially harmful levels of contaminants (exceeding performance standards);

5.7.6.1.3.2 Reduce, minimize or prevent further contaminant releases;

5.7.6.1.3.3 Reduce, minimize or prevent the offsite migration of contaminants.

5.7.6.1.4 The implementability (and time to implement) and costs of the feasible alternatives;

5.7.6.1.5 Recommendations for remedial action.

5.7.6.2 The owner or operator must present the results of the corrective measures assessment, including a proposed remedy, (with a schedule for initiation and completion) for public comment at a public meeting.

5.7.7 Selection of Remedy

5.7.7.1 Based on the results of the corrective measures assessment and public meeting, the owner/operator will select a remedial action.

5.7.7.2 Remedies must:

5.7.7.2.1 Be protective of human health and the environment;

5.7.7.2.2 Control source(s) of contaminant releases so as to reduce or eliminate (to the maximum extent practicable), further releases of contaminants that pose a threat to human health or the environment;

5.7.7.2.3 Comply with the site performance standards at the points of compliance (to the extent feasible); and

5.7.7.2.4 Comply with standards for the management of wastes.

5.7.7.3 The Department may determine that remediation of a contaminant release is not necessary if the permittee can demonstrate to the satisfaction of the Department (or the Department certifies that it is satisfied) that the ground water is not currently or reasonably expected to be a source of drinking water, will not migrate so as to threaten a source of drinking water or will not cause violation of surface water quality standards, (i.e., does not represent a significant threat to human health or the environment).

5.7.8 Implementation of Corrective Action

5.7.8.1 Based on the schedule established under Section 5.7.6.2 for initiation of remedial activities, the owner or operator must:

5.7.8.1.1 implement the corrective action remedy;

5.7.8.1.2 Take any interim measures necessary to ensure protection of human health and the environment (such as replacement of contaminated or imminently threatened water supplies); and

5.7.8.1.3 Perform ground water and/or surface water monitoring to demonstrate the effectiveness of the remedy including whether or not compliance is achieved with the performance standards.

5.7.8.2 If the owner or operator determines, based on information obtained after implementation of the remedy has begun or other information that compliance with remediation objectives (including achievement of performance standards) cannot be practically achieved with the remedy selected, the owner or operator must notify the Department and request authorization to proceed with another feasible method consistent with the overall objective of the remedy.

5.7.8.3 If the permittee determines that compliance with remedial action objectives (Section 5.7.7) cannot be practically achieved, the permittee must notify the Department and implement alternate methods to control exposure of humans or the environment to residual contamination and implement alternative control measures.

5.7.8.4 Remedies selected shall be considered complete when:

5.7.8.4.1 All actions required to implement the remedy have been achieved; and

5.7.8.4.2 The ground water protection standards or alternate requirements agreed upon have been achieved for a period of three years or alternate period approved by the Department.

5.7.8.5 Upon completion of the remedy, the owner or operator must notify the Department that a certification of the remedy has been completed in compliance with the requirement and placed in the operating records. This certification must be signed by a Professional Geologist registered in Delaware.

5.7.8.6 Upon completion of the remedy, the owner or operator will continue ground water monitoring as required by provisions of Section 5.7.3 and approved by the Department.

5.8 Capping System

5.8.1 Requirement for a capping system

5.8.1.1 Upon closure of the landfill or landfill cell the permittee shall install a capping system that will control the emission of gas, promote the establishment of vegetative cover, and minimize infiltration and percolation of water into, and prevent erosion of, the waste throughout the postclosure care period.

5.8.1.2 The capping system shall be in place 180 days following final waste disposal activity unless the Department approves a longer period of time.

5.8.1.3 The capping system shall extend beyond the edge of the lined area.

5.8.1.4 The proposed design of the capping system must be approved by the Department prior to installation.

5.8.2 Composition of the capping system

The capping system shall consist of at least the following components:

5.8.2.1 A final grading layer on the waste, consisting of at least twelve inches of soil, to attain the final slope and provide a stable base for subsequent system components. Daily and intermediate cover may be used for this purpose.

5.8.2.2 A low permeability layer to minimize infiltration, that has a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present. This infiltration control layer must consist of at least the following:

5.8.2.2.1 A 30 mil synthetic geomembrane underlain by a geotextile, or

5.8.2.2.2 24 inches of fine textured soil with a hydraulic conductivity no greater than 1×10^{7} cm/sec.

If the landfill has a synthetic liner system, it must have a synthetic infiltration control layer. Alternative materials that achieve an equivalent performance may be used for the infiltration control layer with prior written approval of the Department.

5.8.2.3 A final cover to provide plant rooting and prevent erosion consisting of:

5.8.2.3.1 Eighteen (18) inches of soil to provide rooting depth and moisture for plant growth; and

5.8.2.3.2 Six (6) inches of topsoil or other material approved by the Department to support the proposed vegetation; or

5.8.2.3.3 A suitable layer of alternative material or combination thereof to assure adequate rooting and moisture retention to support the proposed vegetation.

The permittee shall propose a suitable vegetation dependent upon the quality and characteristics of the topsoil and compatible with the intended final use of the facility. Maintenance schedules and application rates for fertilizer and mulch shall also be submitted for approval.

5.8.3 Final slopes

5.8.3.1 The grades of the final slope shall be constructed in accordance with the following minimum standards:

5.8.3.1.1 The final grade of the top slope, after allowing for settlement and subsidence, shall be designed to promote runoff;

5.8.3.1.2 The final grades of the side slopes shall be, at a maximum, three horizontal to one vertical (3:1).

5.8.3.2 The top and side slopes shall be maintained to prevent erosion of the capping system and to insure complete vegetation cover.

5.9 Landfill Operation And Maintenance Standards

5.9.1 General

5.9.1.1 Sanitary landfills shall be operated so as to create an aesthetically desirable environment and to prevent degradation of land, air, surface water, or ground water.

5.9.1.2 Sanitary landfills shall be maintained and operated to conform with the approved Plan of Operation.

5.9.2 Details of operation and maintenance

5.9.2.1 Spreading and compacting

The working face shall be confined to the smallest practical area, as is consistent with the proper operation of trucks and equipment.

The waste shall be spread in layers and compacted by repeated passes of the compacting equipment to obtain the degree of compaction specified in the Solid Waste permit.

5.9.2.2 Lift depth

The lift depth shall not exceed the limit specified in the Solid Waste permit.

5.9.2.3 Cover

5.9.2.3.1 Daily cover shall be placed over all solid waste by the end of the working day or, at more frequent intervals if necessary.

5.9.2.3.1.1 Daily cover shall control odors, disease vector breeding, animal attraction, blowing litter, scavenging, and reduce the potential for fires.

5.9.2.3.1.2 Daily cover shall consist of six inches of earthen material or an alternate material or thickness approved by the Department in accordance with Section 5.9.2.3.4 of these regulations.

5.9.2.3.1.3 The daily cover layer which remains in place under waste shall not preclude leachate flow downwards towards the leachate collection system.

5.9.2.3.1.4 Exposed daily cover which remains in place for more than two days shall be inspected at least weekly and shall be maintained as necessary to control odors, disease vector breeding, animal attraction, blowing litter, scavenging, and fires.

5.9.2.3.2 Intermediate cover shall be placed over any area that received daily cover and did not receive additional solid waste within 180 days. Intermediate cover may be required more or less frequently if deemed necessary by the Department.

5.9.2.3.2.1 Intermediate cover shall control odors, disease vector breeding, animal attraction, blowing litter, scavenging, and reduce the potential for fires. Intermediate cover shall prevent leachate from entering storm water management systems or surface waters.

5.9.2.3.2.2 Intermediate cover shall consist of 12 inches of earthen material, which may include daily cover. Intermediate cover consisting of alternate materials or thickness may be used as approved by the Department in accordance with Section 5.9.2.3.4 of these regulations.

5.9.2.3.2.3 Intermediate cover placement and maintenance shall be consistent with the operations plan and leachate control design of the landfill. If the intermediate cover has been placed to reduce infiltration of water into the landfill, it must be removed or otherwise modified to allow leachate to move downwards towards the leachate collection system prior to placement of additional solid waste.

5.9.2.3.2.4 Intermediate cover shall be inspected at least weekly and shall be maintained as necessary to control odors, disease vector breeding, animal attraction, blowing litter, scavenging, fires, and to prevent leachate from entering storm water management systems or surface waters.

5.9.2.3.3 Daily or intermediate cover shall not contain putrescible materials or large objects.

5.9.2.3.4 Alternate cover materials. The Department may approve alternate materials or material thickness as daily and intermediate cover once the owner or operator:

5.9.2.3.4.1 provides written request to the Department, demonstrating that the material and supporting operations meet the performance criteria for daily and intermediate covers specified in these regulations without presenting an increased threat to human health or the environment.

5.9.2.3.4.2 prescribes in the operations plan, any unique requirements for placement, maintenance, and inspection of the alternate material and for any additional conditions, equipment, or staff required.

5.9.2.4 Control of nuisances and hazards

5.9.2.4.1 Odor: The operation of the landfill shall not result in odors associated with solid waste being detected off site.

5.9.2.4.2 Litter: The scattering of refuse and windblown litter shall be controlled by the use of portable fences, natural barriers, or other suitable methods. No refuse or litter shall be allowed to migrate off site.

5.9.2.4.3 Vectors, dust, fires: The operation of the landfill shall be conducted in a manner which eliminates to the extent possible insect and rodent breeding, dust problems, and fires.

5.9.2.5 Bulky waste

Adequate provision shall be made for the handling and compaction of bulky wastes when such wastes are not excluded from the site. Tires in quantities greater than ten per truckload shall be sliced or shredded before being landfilled.

5.9.2.6 Special solid wastes

The permittee may make provision for the limited disposal of specified special solid wastes. Disposal of these wastes shall be conducted pursuant to a plan submitted to and approved by the Department.

5.9.2.7 Access

Access roads to the point of waste discharge shall be designed, constructed, and maintained so that traffic will flow smoothly and will not be interrupted by inclement weather.

Access to the site shall be limited to those times when an attendant is on duty and to those persons authorized to use the site for the disposal of solid waste. This section shall not be construed to limit right of entry pursuant to 7 **Del.C.** 6024.

Access to the site by unauthorized persons shall be prevented by the use of barriers, fences and gates, or other suitable means.

5.9.2.8 Salvaging

Salvage operations shall be so organized that they will not interfere with the proper disposal of any solid waste. No salvage operation shall be allowed which creates unsightliness, nuisances, health hazards, or potential safety hazards.

5.9.2.9 Personnel

Sufficient numbers and types of personnel shall be available at the site to insure capability for operation in accordance with these regulations.

5.9.2.10 Equipment

Adequate numbers and types of equipment commensurate with the size of the operation shall be available at the site to insure operation of the landfill in accordance with the provisions of these regulations and the plan of operation. Substitute equipment shall be obtained when maintenance or breakdown renders normal operating equipment inoperative for more than 24 hours. All refuse moving equipment shall be cleaned routinely and maintained according to the manufacturer's recommendations.

5.9.2.11 Employee health and safety

Employees at the site shall work under all appropriate health and safety guidelines established by the Occupational Safety and Health Administration.

The owner or operator of the landfill shall provide suitable shelter, sanitary facilities, and safe drinking water for personnel at the site.

A reliable telephone or radio communication system shall be provided for site personnel.

First aid equipment shall be available at the site.

5.9.2.12 Procedures for excluding the receipt of hazardous waste

5.9.2.12.1 Owners or operators of all sanitary landfill cells must implement a program at the facility for detecting and preventing the disposal of regulated hazardous wastes and polychlorinated biphenyls (PCB) wastes. This program must include, at a minimum:

5.9.2.12.1.1 Random inspections of incoming loads unless the owner or operator takes other steps to ensure that incoming loads do not contain regulated hazardous wastes or PCB wastes;

5.9.2.12.1.2 Records of any inspections;

5.9.2.12.1.3 Training of facility personnel to recognize regulated hazardous waste and PCB wastes; and

5.9.2.12.1.4 Notification of the Department if a regulated hazardous waste or PCB waste is discovered at the facility.

5.9.3 Recordkeeping

The following information must be recorded, as it becomes available, and retained by the owner or operator of any new or existing sanitary landfill until the end of the postclosure care period of the landfill:

5.9.3.1 Records demonstrating that liners, leachate control systems, gas control systems, cap-ping systems, and all monitoring systems are constructed or installed in accordance with the design criteria required in Section 5, Subsections 3, 4, 5, 6, 7 and 8.

5.9.3.2 Monitoring, testing, or analytical data where required by Section 5, Subsections 4, 5, 6, 7, and 8.

5.9.3.3 Volume and/or weight of wastes received quarterly.

5.9.3.4 Types of waste received quarterly (industrial waste, asbestos-containing waste, and other wastes which require Department approval prior to being landfilled).

5.9.3.5 Location of any monofilled waste.

5.9.3.6 Any additional records specified by the Department.

5.9.4 Reporting

The permittee shall submit to the Department on an annual basis a report summarizing facility operations for the preceding calendar year. The report shall describe and summarize all solid waste disposal, environmental monitoring, and construction activities conducted within the year covered by the report. The report shall include, but not necessarily be limited to, the following:

5.9.4.1 The volume or tonnage of solid waste landfilled at the facility;

5.9.4.2 The estimated remaining capacity of the facility, in both tonnage and years;

5.9.4.3 The volumes (or tonnages) and types of specified special solid wastes landfilled at the facility;

5.9.4.4 Leachate quantity and quality data as required in Section 5.4.4, and specified in the Solid Waste permit;

5.9.4.5 Gas monitoring data as required in Section 5.5.3, and specified in the Solid Waste permit;

5.9.4.6 An updated estimate of the cost of closure and postclosure care of the facility, as required in Section 5.10.3.4;

5.9.4.7 Any intentional or accidental deviations from the approved Plan of Operation, and any unusual situations encountered during the year;

5.9.4.8 All construction or corrective work conducted on the site in accordance with approved plans or to achieve compliance with these regulations.

The permittee must also submit any additional reports specified in the Solid Waste permit.

5.9.5 Prohibitions

5.9.5.1 The owner or operator of a sanitary landfill shall not knowingly accept for disposal any hazardous waste.

5.9.5.2 Open burning of any solid waste is prohibited within the active portion of the sanitary landfill.

5.9.5.3 Sanitary landfills are prohibited from accepting bulk or noncontainerized liquid waste unless the waste is a household waste other than septic waste.

5.9.5.4 Scavenging is prohibited on any landfill site.

5.10 Closure

5.10.1 General

The owner or operator of a sanitary landfill must close the completed landfill or landfill cell in a manner that:

5.10.1.1 Minimizes the need for further maintenance, and

5.10.1.2 Minimizes the postclosure escape of solid waste constituents, leachate, and landfill gases to the surface water, ground water, or atmosphere.

5.10.2 Required submittals; notification

5.10.2.1 An owner or operator of a new sanitary landfill must submit a conceptual closure plan for the facility at the time of initial permit application.

5.10.2.2 At least 180 days prior to the projected date when wastes will no longer be accepted at the landfill or cell, the landfill owner or operator shall submit to the Department written notification of intent to close the facility or cell, a closure plan, and a closure schedule.

5.10.2.3 If the Department determines that the closure plan and closure schedule are sufficient to ensure closure in accordance with the performance standards described in Section 5.10.1, it will modify the solid waste permit to allow closure to take place.

5.10.2.4 The owner or operator shall not commence closure activities before receiving the necessary modifications to the solid waste permit.

5.10.2.5 A copy of the closure plan must be maintained at the facility or at some other location designated by the owner or operator through the postclosure care period of the facility.

5.10.3 Closure plan contents

Closure plans for sanitary landfills must include, as a minimum, the following:

5.10.3.1 A description of the methods, procedures, and processes that will be used to close a landfill and each individual cell thereof in accordance with the closure performance standard in Section 5.10.1.

5.10.3.2 A description of the capping system required under Section 5.8. This shall include a description of the system design, the type of material to be used, and a discussion of how the capping system will achieve the objectives of Section 5.10.1, above.

5.10.3.3 A description of other activities necessary to satisfy the closure performance standard including, but not limited to, the removal or disposal of all nonlandfilled wastes located on site (e.g., wastes from landfill runoff collection ponds).

5.10.3.4 An estimate of the cost of closing the facility or cell and of the cost of postclosure monitoring and maintenance throughout the postclosure care period. These estimates shall be updated yearly and submitted to the Department as part of the annual report described in Section 5.9.4.

5.10.3.5 A plan for postclosure care of the facility sufficient to ensure that the standards described in Section 5.10.1 will be met. This will include:

5.10.3.5.1 A description of the monitoring and maintenance activities required and the frequency at which these activities will be performed.

5.10.3.5.2 The name, address, and telephone number of the person or office to contact about the facility during the postclosure period.

5.10.3.5.3 A description of the planned uses of the property during the postclosure period.

5.10.3.6 A plan for control and/or recovery of landfill gases.

5.10.3.7 A closure construction quality assurance plan.

5.10.4 Minimum closure requirements

5.10.4.1 The permittee shall notify the Department at least 30 working days prior to commencing closure activities. The Department shall inspect the site, and the permittee shall perform any corrective work which the Department deems necessary.

5.10.4.2 Finished portions of the landfill shall receive a capping system which meets the requirements of Section 5.8.

5.10.4.3 Finished portions of the landfill shall be planted with appropriate vegetation to promote stabilization of the cover.

5.10.4.4 The closure shall be carried out in accordance with the approved closure plan and according to the approved closure schedule. Any significant deviations from the plan or the schedule must be approved by the Department prior to being initiated.

5.10.4.5 Upon closure of an entire landfill, all nonlandfilled wastes located on site shall be removed or disposed of in a manner approved by the Department.

5.10.4.6 After closure of the facility, the site shall be returned to an acceptable appearance consistent with the surrounding area and the intended use of the land.

5.10.4.7 When closure is completed, the owner or operator shall submit a final report for the Department's approval. The final report shall certify that the closure of the landfill or cell was completed in accordance with the closure plan to include the construction quality assurance plan, construction and material specifications, and design drawings. The final report shall be certified correct by the construction quality assurance engineer, who must be a Professional Engineer registered in Delaware. The landfill or cell will not be considered closed until the Department has provided its written notification that the closure construction and the final report meet the requirements of the solid waste permit and these regulations. The Department will inspect the cell or facility and will either:

5.10.4.7.1 Issue a letter of approval to certify that the site has been closed in accordance with the solid waste permit, the closure plan, and all applicable regulations; or

5.10.4.7.2 Determine that the site is not in compliance with the solid waste permit, the closure plan, or applicable regulations; identify the areas of deficiency; and require the owner or operator to take the necessary actions to bring the site into compliance.

5.10.4.8 Facilities entering the post-closure period will be issued a post-closure permit based upon the approved post-closure plan, monitoring requirements, gas and leachate control, maintenance, and corrective actions (if required).

5.11 Postclosure Care

5.11.1 General

5.11.1.1 The owner or operator of a sanitary landfill must continue postclosure care for 30 years after the completion of closure.

5.11.1.2 At any time during the postclosure care period the Department may remove one or more of the postclosure care requirements described in Section 5.11.2 below if it determines that the requirement(s) is/are no longer necessary for the protection of human health and the environment.

5.11.1.3 At any time after the first five years of the postclosure care period, the Department may reduce the length of the postclosure care period or terminate postclosure care if it determines that such care is no longer necessary.

5.11.1.4 Prior to the time that the postclosure care period is due to expire, the Department may extend the postclosure care period if it determines that the extended period is necessary to protect human health and the environment.

5.11.1.5 If at any time during the postclosure care period there is evidence of a contaminant release from the landfill that presents a significant threat to human health or the environment, action to mitigate the threat will be required of the owner or operator of the facility.

5.11.2 Minimum postclosure care requirements

Postclosure care shall be in accordance with the post-closure permit and must consist of at least the following:

5.11.2.1 Maintaining the integrity and effectiveness of the capping system, including making repairs as necessary to correct the effects of settling, subsidence, erosion, or other events, and preventing runon and runoff from eroding or otherwise damaging the cap.

5.11.2.2 Reseeding the cover if insufficient vegetation exists to stabilize the surface.

5.11.2.3 Maintaining and operating the leachate collection and treatment systems until the Department determines that the leachate no longer poses a threat to human health or the environment. The permittee shall submit leachate quantity and quality data to the Department for those parameters and at such frequencies as specified by the Department.

5.11.2.4 Maintaining and operating the ground water monitoring system in accordance with Section 5.7. The permittee shall submit ground water quality data as specified by the Department.

5.11.2.5 Maintaining and monitoring the gas control and/or recovery system in accordance with Section 5.5 and the closure plan. The permittee shall submit gas data as specified by the Department.

5.11.2.6 Maintaining and monitoring the surface water management system in accordance with Section 5.6.

5.11.3 Prohibitions

5.11.3.1 Standing water shall not be allowed on the closed landfill.

5.11.3.2 Open burning shall not be allowed on the closed landfill.

5.11.3.3 Unless approved in advance by the Department, no activity shall be conducted on a closed landfill.

5.11.3.4 Access to the closed landfill shall be limited to those persons who are engaging in activities which are compatible with the intended postclosure use of the site.

5.11.4 Postclosure land use

The owner or operator shall implement the postclosure land use plan approved by the Department.

5.11.5 Notice in Deed to Property

5.11.5.1 The owner of the property on which a sanitary landfill is located must record ~~a notation on the deed to the facility property, or some other instrument that is normally examined during title search,~~ an environmental covenant, per **Delaware Code** Title 7, Chapter 79, Subchapter II, with the deed to the facility property that will in perpetuity notify any potential purchaser of the property:

5.11.5.1.1 The land has been used as a solid waste disposal site, and

5.11.5.1.2 The use of the land is restricted under this regulation.

5.11.5.2 Included with the notation shall be a map or description clearly specifying the area that was used for disposal.

8 DE Reg. 354 (8/1/04)

6.0 Industrial Landfills

(NOTE: This section applies to those landfills that dispose of only industrial and/or dry waste.)

6.1 Siting

6.1.1 Industrial landfill facilities shall be located only in areas where the potential for degradation of the quality of air, land, and water is minimal.

6.1.2 All industrial landfill facilities shall be constructed to at least minimum design requirements as contained in Section 6.2. More stringent designs will be required where deemed necessary by the Department for the protection of ground water resources.

6.1.3 No new cell of an industrial landfill shall be located in an area such that solid waste would at any time be deposited:

6.1.3.1 Within the 100 year flood plain.

6.1.3.2 In an area that may cause or contribute to the degradation of any state or federally regulated wetlands unless the owner or operator can demonstrate to the satisfaction of the appropriate wetlands regulatory agency that:

6.1.3.2.1 there is no impact to any regulated wetlands on the site, or

6.1.3.2.2 any impact will be mitigated as required.

6.1.3.3 Within one mile of any state or federal wildlife refuge, wildlife area, or park, unless specifically exempted from this requirement by the Department.

6.1.3.4 So as to be in conflict with any locally adopted land use plan or zoning requirement.

6.1.3.5 Within the wellhead protection area of a public water supply well or well field.

6.1.3.6 In areas where valuable aquifers would be threatened by contaminant releases, unless viable alternatives have been dismissed and stringent design measures have been incorporated to minimize the possibility and magnitude of releases.

6.1.3.7 Within 200 feet of the facility boundary unless otherwise approved by the Department.

6.1.3.8 In an area that is environmentally unique or valuable.

6.2 Design

6.2.1 General

Industrial landfills shall be planned and designed by professional engineers registered in Delaware. Planning and design of these facilities shall be consistent with this regulation and based on empirically derived data and state of the art technology.

6.2.2 Minimum design requirements

All industrial landfills shall be designed to include at least the following:

6.2.2.1 A setback area, including a buffer zone with appropriate screening, if deemed necessary by the Department.

6.2.2.2 A liner that meets the requirements of Section 6.3.

6.2.2.3 Leachate collection, treatment and disposal, and monitoring systems that meet the requirements of Section 6.4.

6.2.2.4 A gas control system, if deemed necessary by the Department. This system shall meet the requirements of Section 6.5.

6.2.2.5 A surface water management system that meets the requirements of Section 6.6.

6.2.2.6 A ground water monitoring system that meets the requirements of Section 6.7.

6.2.2.7 A capping system that meets the requirements of Section 6.8.

6.3 Liner

6.3.1 General provisions

6.3.1.1 An impermeable liner shall be provided at all industrial landfills to restrict the migration of leachate from the landfill and to prevent contamination of the underlying ground water.

6.3.1.2 The Department reserves the right to set a more stringent liner requirement when it determines that a composite liner is not sufficient to protect human health and the environment.

6.3.1.3 The bottom of the liner (of the secondary liner, in a double liner system) shall be at least five (5) feet above the seasonal high water table, as measured in the uppermost aquifer beneath the landfill. This 5-foot requirement may be reduced by the Department if a more stringent liner system is used.

6.3.1.4 All liners shall be prepared, constructed, and installed in accordance with a quality assurance plan included in the engineering report [4.2.1.4] and approved by the Department. For synthetic liners, the plan shall incorporate the manufacturer's recommendations.

Qualifications of the construction quality assurance staff (CQA) and the geosynthetics installer, including master seamers, on-site supervisor, and construction quality control (CQC) personnel, shall be submitted to the Department for review prior to their performing these duties on site.

All conformance and destructive samples taken as part of the construction quality assurance plan shall be tested at an independent laboratory which is accredited by the Geosynthetics Institute's Laboratory Accreditation Program (by applicable test method) or other accreditation program acceptable to the Department.

6.3.2 Liner characteristics

6.3.2.1 Composite liner

A composite liner must have, as a minimum:

6.3.2.1.1 A primary (upper) liner which meets the following:

6.3.2.1.1.1 Is at least 45 mils thick.

6.3.2.1.1.2 Is constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to physical contact with the leachate to which it is exposed, climatic conditions, the stresses of installation, and the stresses of daily operation.

6.3.2.1.1.3 Is made of synthetic material that meets minimum requirements of the National Sanitation Foundation's publication, "Standard Number 54-1993, Flexible Membrane Liners" for membrane materials covered by this standard, or of other materials of equal or better performance as approved by the Department.

6.3.2.1.1.4 Is chemically resistant to the waste and leachate managed at the facility. The EPA Test Method 9090 shall be performed using a solid waste leachate (a synthetic leachate mix approved by the Department may be substituted if existing leachate is not available). The specified physical parameters shall be tested before and after liner exposure. Any significant change in test properties shall be considered to be indicative of incompatibility.

6.3.2.1.1.5 Is compounded from first quality virgin materials. No reground or reprocessed materials containing encapsulated scrim shall be used in the manufacturing of the liner.

6.3.2.1.1.6 Is free of pinholes, blisters, holes, and contaminants, which include, but are not limited to, wood, paper, metal and nondispersed ingredients.

6.3.2.1.2 A secondary (lower) liner composed of:

6.3.2.1.2.1 Compacted clay at least two feet thick with a hydraulic conductivity no greater than 1×10^{-7} cm/sec, or

6.3.2.1.2.2 An equivalent material acceptable to the Department.

6.3.2.2 Natural liner

6.3.2.2.1 Use of natural material for liners is restricted to those areas where:

6.3.2.2.1.1 Underlying ground water is not used and is not reasonably expected to be used for water supplies, and

6.3.2.2.1.2 The landfill subbase is subject to compaction and settlement such that a synthetic membrane would not be feasible.

6.3.2.2.2 A natural liner must meet the following requirements as a minimum:

6.3.2.2.2.1 It shall consist of compacted clay or equivalent material having a hydraulic conductivity no greater than 1×10^{7} cm/sec.

6.3.2.2.2.2 The material shall be at least five (5) feet thick, and thicker if necessary to prevent any leachate from migrating through the liner at any time during the active life and through the postclosure care period of the facility.

6.3.2.2.2.3 The material proposed for use shall be tested by ASTM or equivalent methods for the following:

Grain size
Classification
Compaction
Specific gravity
Hydraulic conductivity
Porosity
pH
Cation exchange capacity
Pinhole test (if required)
Mineralogy (if required)

All data shall be submitted to the Department prior to construction.

6.3.2.2.2.4 Testing of the saturated hydraulic conductivity and the effect of leachate on soil hydraulic conductivity shall be performed in accordance with test methods described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA Publication SW-846 [Third Edition (November 1986), as amended by Updates I (dated July 1992), II (dated September 1994), IIA (dated August 1993), IIB (dated January 1995), III (dated December 1996), and IIIA (dated April 1998)], or other tests approved in writing by the Department.

6.3.2.2.2.5 If onsite soils are to be used as a natural liner, the uppermost five (5) feet of soil shall be excavated and recompacted to ensure homogeneity of the liner, provided, however, that with respect to dredge spoil soils, the excavation and recompaction requirement shall not apply if the applicant can demonstrate that the dredge spoil soils have acceptable characteristics as indicated above.

6.3.2.3 Double liner system

A double liner system shall meet the following requirements:

6.3.2.3.1 It shall consist of two single liners separated by a drainage layer containing a leak detection system.

6.3.2.3.2 The primary (top) liner shall be a synthetic liner which is at least 30 mils thick and which meets the requirements of Section 6.3.2.1.1.2 - 6.3.2.1.1.6.

6.3.2.3.3 The secondary (bottom) liner may be either synthetic or natural. If synthetic, it must be at least 30 mils thick and must meet the requirements of Section 6.3.2.1.1.2 - 6.3.2.1.1.6. If natural, it must meet the requirements of Section 6.3.2.2.

6.3.2.3.4 The drainage layer separating the two liners shall consist of at least 12 inches of soil having a hydraulic conductivity greater than 1×10^{2} cm/sec based on laboratory and field testing.

Alternate material may be used for the drainage layer with prior written approval of the Department.

6.3.2.3.5 The leak detection system shall be capable of detecting and intercepting liquid within the drainage layer and conveying the liquid to a collection sump or monitoring point where the quantity of flow can be measured and the liquid can be sampled. The operator or designer shall calculate the Action Leakage Rate. The proposed Action Leakage Rate and a response plan if the Action Leakage Rate is exceeded shall be submitted to the Department for approval before construction of the liner is permitted. The system shall be designed to operate without clogging through the postclosure care period of the facility.

6.3.2.3.6 The upper synthetic liner membrane shall be underlain by either a geosynthetic clay or 2 feet of natural material with a permeability no greater than 10^{7} cm/sec. Alternate liner designs may be used with prior written approval of the Department.

6.3.3 Liner construction

6.3.3.1 Construction/installation of composite liner

6.3.3.1.1 At least 15 working days prior to installation of the liner, the owner or operator shall notify the Department of the installation date.

6.3.3.1.2 The liner shall be installed upon a subbase which meets the following requirements:

6.3.3.1.2.1 It shall be capable of supporting the loads and withstanding the stresses that will be imposed on it through the active life and postclosure care period of the facility and of resisting the pressure gradient above and below the liner caused by settlement, compression, or uplift.

6.3.3.1.2.2 It shall have a smooth surface that is free of all rocks, stones, roots, sharp objects, or debris of any kind.

6.3.3.1.2.3 It shall be certified in writing by the liner installer as an acceptable subbase for the liner. Written certification of acceptability shall be submitted to the Department prior to installation of the liner. However, submittal of written acceptance may proceed incrementally according to installation schedule.

6.3.3.1.3 The minimum post-loading slopes of the liner shall either be:

6.3.3.1.3.1 two (2) percent on controlling slopes and one-half (0.5) percent on remaining slopes, OR

6.3.3.1.3.2 the controlling and remaining slopes shall be designed to prevent the head on the liner, excluding sump areas, from exceeding a depth of twelve (12) inches including post settlement conditions.

6.3.3.1.4 The landfill shall be designed to minimize penetrations through the liner. If a penetration is essential, a liquidtight seal must be accomplished between the penetrating structure and the synthetic membrane. Compaction of areas adjacent to the penetrating structure shall be to the same density as the surrounding soil to minimize differential settlement. Sharp edges on the penetrating structure must not come in contact with the synthetic material.

6.3.3.1.5 Bridging or stressed conditions in the liner shall be avoided with proper slack allowances for shrinkage of the liner during installation and before the placement of a protective soil layer.

6.3.3.1.6 Synthetic liners shall have factory and field seams that equal or exceed the strength requirements defined by the National Sanitation Foundation's "Standard Number 54-1993" for that liner material. All seams must be visually inspected and tested along their entire length for seam continuity using suitable nondestructive techniques. Seams shall also be tested for strength, at a frequency specified in the quality assurance plan. In addition, field seams shall meet the following requirements:

6.3.3.1.6.1 Field seaming shall provide a dry sealing surface.

6.3.3.1.6.2 Seaming shall not be done when wind conditions prevail.

6.3.3.1.6.3 Seams shall be made and bonded in accordance with the supplier's recommended procedures.

6.3.3.1.7 Proper equipment shall be used in placing drainage material over the synthetic liner to avoid stress.

6.3.3.1.8 The synthetic membrane shall be protected from the waste by at least two (2) feet of drainage material incorporating the leachate collection system.

6.3.3.1.9 The synthetic membrane must be underlain by a secondary liner as described in Section 6.3.2.1.2.

6.3.3.2 Construction of natural liner

6.3.3.2.1 All lenses, cracks, channels, root holes, or other structural nonuniformities that can increase the saturated hydraulic conductivity above 1×10^{7} cm/sec shall be removed.

6.3.3.2.2 Natural liners shall be constructed in lifts not exceeding six (6) inches after compaction to maximize the effectiveness of the compaction throughout the lift thickness. Each lift shall be properly interfaced by scarification between lifts to ensure the bonding.

6.3.3.2.3 Clods shall be broken up and the material shall be homogenized before compaction of each lift using mixing devices such as pug mills or rotary tillers.

6.3.3.2.4 The maximum slope of the sidewalls shall not be so great as to preclude effective compaction.

6.3.3.3 Construction/installation of double liner

6.3.3.3.1 The secondary liner shall be constructed in accordance with Section 6.3.3.2 (if it is a natural liner) or Section 6.3.3.1.1 - 6.3.3.1.7 (if it is synthetic).

6.3.3.3.2 The primary liner shall be constructed in accordance with Section 6.3.3.1.1 and 6.3.3.1.3 - 6.3.3.1.8.

6.4 Leachate Collection, Treatment, Disposal, And Monitoring

6.4.1 General provisions

6.4.1.1 All industrial landfills shall be designed and constructed to include a leachate collection system, a leachate treatment and disposal system, and a leachate monitoring system.

6.4.1.2 The leachate systems shall be constructed, installed, and maintained in accordance with the Department approved quality assurance plan.

6.4.1.3 The owner or operator shall keep and maintain documentation for the quality assurance procedures through the postclosure care period of the facility.

6.4.2 Leachate collection

6.4.2.1 Minimum design specifications

6.4.2.1.1 The leachate collection system shall be designed to operate without clogging through the postclosure care period of the facility.

6.4.2.1.2 All elements of the system (pipes, sumps, pumps, etc.) shall be sized according to water balance calculations and shall be capable of handling peak flows.

6.4.2.1.3 Collection pipes shall be sized and spaced to efficiently remove leachate from the bottom of the waste and the side walls of the cell. The capacity of the mains shall be at least equal to the sum of the capacities of the laterals.

6.4.2.1.4 The pipes shall be designed to withstand the weight, stresses, and disturbances from the overlying wastes, waste cover materials, equipment operation, and vehicular traffic.

6.4.2.1.5 The collection pipes shall be designed to drain by gravity to a sump system. Sumps must function automatically and shall contain a conveyance system for the removal of leachate.

6.4.2.1.6 Manholes or cleanout risers shall be located along the perimeter of the leachate collection system. The number and spacing of the manholes shall be sufficient to insure proper maintenance of the system by water jet flushing or an equivalent method.

6.4.2.1.7 Innovative leachate collection systems incorporating alternative designs may be used, after approval by the Department, if they are shown to be equivalent to or more effective than the specified design.

6.4.2.1.8 The leachate collection system must be designed to prevent the leachate head on the liner from exceeding a depth of 12 inches.

6.4.2.2 Construction standards

6.4.2.2.1 The leachate collection system shall be installed immediately above an impermeable liner and at the bottom of a drainage layer. The drainage layer shall be at least 12 inches thick with a hydraulic conductivity not less than $1x10^2$ cm/sec and a minimum post-loading controlling slope of two (2) percent.

Alternate materials may be used for the drainage layer, with prior written approval of the Department.

6.4.2.2.2 The following tests shall be performed on the soil proposed for use in the drainage layer, and all data shall be submitted to the Department prior to construction of the drainage layer. These tests shall be performed in accordance with current ASTM, AASHTO, or equivalent methods.

Classification
Porosity
Relative density or compaction
Specific gravity
Hydraulic conductivity

6.4.2.2.3 The leachate collection system and manholes or cleanout risers shall be constructed of materials that can withstand the chemical attack that results from leachates.

6.4.2.3 Operational procedures

6.4.2.3.1 The leachate collection system shall operate automatically whenever leachate is present in the sump to remove accumulated leachate.

6.4.2.3.2 Inspections shall be conducted weekly to verify proper functioning of the leachate collection system and to detect the presence of leachate in the removal sump. The owner or operator shall keep records on the system to provide sufficient information that the leachate collection system is functional and operating properly. The amount of leachate collected from each cell shall be recorded on a weekly basis.

6.4.2.3.3 Collection lines shall be cleaned according to a Department approved scheduled maintenance program and more frequently if required.

6.4.3 Leachate treatment and disposal

6.4.3.1 The leachate treatment and disposal system shall be designed in accordance with one of the following options:

6.4.3.1.1 Complete treatment onsite with or without direct discharge to surface water

6.4.3.1.2 Pretreatment onsite with discharge to an offsite treatment works for final treatment

6.4.3.1.3 Storage onsite with discharge to an offsite treatment works for complete treatment

6.4.3.1.4 Direct discharge to an offsite treatment works

6.4.3.1.5 Pretreatment on site with discharge on site.

The permittee must maintain all necessary permits and approvals for leachate storage and discharge activities.

6.4.3.2 Leachate storage prior to treatment shall be within tanks constructed and installed in accordance with the following standards:

6.4.3.2.1 The tank shall be placed above ground.

6.4.3.2.2 The storage tank shall be designed in accordance with American Petroleum Institute (API), Underwriters Laboratory (UL), or an equivalent standard appropriate to the material being used, and shall be constructed of or lined with material which has a demonstrated chemical resistance to the leachate.

6.4.3.2.3 The storage tank area shall have a liner capable of preventing any leachate which may escape from the tank from coming into contact with the underlying soil.

6.4.3.2.4 The storage tank area shall be surrounded by a berm, and the bermed area shall have a capacity at least ten percent greater than the capacity of the tank.

6.4.3.2.5 All storage tanks shall be equipped with a venting system.

6.4.3.2.6 All storage tanks shall be equipped with a high liquid level alarm or warning device. The alarm system shall be wired to the location where assistance will be available to respond to the emergency.

6.4.3.3 Onsite complete treatment or pretreatment facilities shall be designed and constructed in accordance with the following:

6.4.3.3.1 Onsite treatment units shall be designed based on the results of a treatability study, the results of the operations of a pilot plant, or written information documenting the performance of an equivalent leachate treatment system.

6.4.3.3.2 Onsite treatment units shall be designed and constructed by staging of the units to allow for online modification of the treatment system to account for variability of the leachate quality and quantity.

6.4.3.4 For all leachate discharges planned for publicly owned treatment works (POTW), the owner or operator of the landfill shall notify the receiving POTW of intent to discharge leachate into the collection system and shall provide the POTW with analysis of the leachate as required by the POTW.

6.4.3.5 All leachate treatment and disposal systems shall be designed and constructed to control odors.

6.4.3.6 Residuals from the onsite treatment and disposal systems shall be sampled and analyzed for hazardous waste characteristics in accordance with Delaware's Regulations Governing Hazardous Waste.

6.4.3.7 Recirculation of leachate may be allowed, subject to approval by the Department, to accelerate decomposition of the waste. Recirculation will be allowed only in areas constructed with a composite liner system or a double liner system. The method of recirculation must be approved by the Department in advance and annually so long as the recirculation continues. Records of leachate collected and recirculated must be kept and reported and any resultant problems reported to the Department and remedied as soon as practicable and included in the annual report.

6.4.4 Leachate monitoring

6.4.4.1 The leachate monitoring system shall be capable of measuring the quantity of the flow and sampling the leachate from each landfill cell. The volume of leachate collected from each cell shall be determined at least monthly and reported quarterly.

6.4.4.2 Leachate monitoring of the influent and effluent of the treatment and disposal system shall be performed according to a Department approved plan which includes quality control and quality assurance procedures.

6.4.4.3 Samples of leachate effluent and influent shall be analyzed as specified by the Department. The parameters to be analyzed will depend on the characteristics of the waste.

6.4.4.4 Leachate monitoring results shall be submitted to the Department as required.

6.4.4.5 For a double liner system, if the Action Leakage Rate of the leak detection system is exceeded, the owner or operator of the landfill shall notify the Department within five (5) working days. The owner or operator shall also sample and analyze the liquid in the leak detection system for parameters required by the Department.

6.5 Gas Control

6.5.1 General provisions

6.5.1.1 Gas control systems shall be installed at industrial landfills where the materials landfilled would be expected to produce gas through biological activity or reaction.

6.5.1.2 The gas control system shall be designed and constructed to:

6.5.1.2.1 Evacuate gas from within the waste to prevent the accumulation of gas onsite or offsite,

6.5.1.2.2 Prevent and control damage to vegetation,

6.5.1.2.3 Prevent odors from the facility being detectable at the facility property line in sufficient quantities to cause or create a condition of air pollution.

6.5.1.3 The concentration of landfill gas in facility structures (except gas recovery system components) and at the facility boundary shall not exceed 25% of the lower explosive limit.

6.5.2 Design and construction standards

6.5.2.1 The owner or operator of an industrial landfill shall consider both active and passive gas control systems and shall provide an evaluation of the proposed system for Department approval.

6.5.2.2 The owner or operator shall perform an analysis to establish the required spacing of gas control vents to provide an effective system.

6.5.2.3 The gas control system shall be designed to evacuate gas from all levels within the waste.

6.5.2.4 The system shall not interfere with or cause failure of the liner or leachate systems.

6.5.3 Monitoring

6.5.3.1 A sufficient number of gas monitoring wells shall be installed to evaluate gas production rates in the landfill.

6.5.3.2 The owner or operator shall sample the gas monitoring wells and provide analytical results as required by conditions specified in the facility permit.

6.5.3.3 At landfills utilizing natural liners, gas monitoring probes must be installed in the soil outside the lined area to evaluate any lateral migration of landfill gas.

6.5.3.4 Emissions from active and passive gas control systems may require a permit from the Air Resources Section of the Division of Air and Waste Management.

6.6 Surface Water Management

6.6.1 General provision

An owner or operator of an industrial landfill shall design, construct, and maintain a surface water management system to:

6.6.1.1 Prevent erosion of the waste and cover,

6.6.1.2 Prevent the collection of standing water, and

6.6.1.3 Minimize surface water runoff onto and into the waste.

6.6.2 Design requirements

6.6.2.1 The surface water management system shall be designed to control, at a minimum, the runoff from the discharge of a 2-hour, 10-year storm.

6.6.2.2 The system shall be designed to include:

6.6.2.2.1 Detention basins to provide temporary storage of the expected runoff from the design storm with sufficient reserve capacity to contain accumulated precipitation and sediment prior to discharge.

6.6.2.2.2 Diversion structures designed to prevent runoff generated within the active cells from moving off site of the lined areas.

6.6.3 Channeling of runoff

6.6.3.1 Runoff from the active cell(s) must be channeled to the leachate treatment and disposal system.

6.6.3.2 Runoff from closed cells will be directed to the detention basins or other approved sedimentation control systems.

6.6.4 Discharge

Discharge from the detention basins shall be in compliance with all applicable federal and state regulations.

6.7 Ground Water Monitoring And Corrective Action

6.7.1 General provision

Owners or operators of all industrial landfill facilities shall maintain and operate a ground water monitoring program to evaluate facility impact upon ground water quality.

6.7.2 Design and construction of monitoring system

6.7.2.1 The ground water monitoring system shall be designed by a Professional Geologist registered in Delaware.

6.7.2.2 The system shall consist of a sufficient number of wells, installed at appropriate locations and depths, to define the ground water flow system and shall be developed in accordance with Departmental requirements to yield ground water samples that are representative of the aquifer water quality.

6.7.2.3 The number, spacing, location, depth, and screened interval of the monitoring wells shall be approved by the Department prior to installation.

6.7.2.4 All monitoring wells shall be constructed in accordance with the Regulations Governing the Construction of Water Wells and any subsequently approved guidelines. Variation from the existing guidelines must be approved by the Department in writing prior to construction.

6.7.3 Ground water sampling

6.7.3.1 The permittee shall submit a ground water sampling plan to the Department at the time of permit application. The sampling plan must include procedures and techniques for:

6.7.3.1.1 Sample collection, preservation, and transport:

6.7.3.1.1.1 Samples will be collected at low flow rates (<1 l/min) to minimize turbidity of the samples.

6.7.3.1.1.2 Samples will be field filtered only when turbidity exceeds 10 NTU. Repeated sampling of any well where turbidity exceeds 10 NTU is not permitted without Department approval. Approval will only be granted in cases where turbidity cannot be controlled by careful well construction, development and sampling.

6.7.3.1.2 Analytical procedures and quality assurance, and

6.7.3.1.3 Chain of custody control.

6.7.3.2 Sample constituents

6.7.3.2.1 The parameters to be analyzed shall depend upon the characteristics of the waste and shall be specified by the Department.

6.7.3.2.2 Test methods used to determine the parameters of Section 6.7.3.2.1 shall be those described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA Publication Number SW-846, Third Edition (November 1986), as amended by Updates I (dated July 1992), II (dated September 1994), IIA (dated August 1993), IIB (dated January 1995), III (dated December 1996), and IIIA (dated April 1998), or other tests approved in writing by the Department.

6.7.3.3 The Department may observe*,* and may request advance notice of, the ground water sampling conducted by the permittee or his/her designee and may request split samples for analysis.

6.7.3.4 If the Department determines that the ground water monitoring data indicate that ground water contamination has occurred, a remedial action program may be required.

6.7.4 Reporting

6.7.4.1 All ground water**,** leachate, and gas monitoring shall be conducted on a schedule to be determined by the Department and the results submitted within 60 days of sampling.

6.7.4.2 An annual hydrogeologic report will be prepared which shall include:

6.7.4.2.1 Tabulation of all leachate flow and quality and ground water quality data from current and preceding years,

6.7.4.2.2 Graphical presentation of leachate flow and quality and ground water quality data from current and preceding years as required in the operating permit,

6.7.4.2.3 Maps showing ground water flow patterns at each time of ground water sampling,

6.7.4.2.4 A discussion of the ground water monitoring results, and

6.7.4.2.5 Recommendations for future monitoring.

6.7.5 Assessment of Corrective Measures

6.7.5.1 An assessment (reassessment) of corrective measures by the owner or operator is required (within 90 days) of confirmation of a contaminant release or an exceedance of a performance standard. The owner or operator must perform this assessment which must include:

6.7.5.1.1 Identification of the nature and extent of the release (which may require construction and sampling of additional wells, analysis for additional constituents including those required for leachate, geophysical surveys and/or other measures);

6.7.5.1.2 Reassessment of contaminant fate and potential contaminant receptors (wells and/or receiving streams);

6.7.5.1.3 Evaluation of feasible corrective measures to:

6.7.5.1.3.1 Prevent exposure to potentially harmful levels of contaminants (exceeding performance standards);

6.7.5.1.3.2 Reduce, minimize or prevent further contaminant releases; and

6.7.5.1.3.3 Reduce, minimize or prevent the offsite migration of contaminants.

6.7.5.1.4 The implementability (and time to implement) and costs of the feasible alternatives; and

6.7.5.1.5 Recommendations for remedial action.

6.7.5.2 The owner or operator must present the results of the corrective measures assessment, including a proposed remedy, (with a schedule for initiation and completion) for public comment at a public meeting.

6.7.6 Selection of Remedy

6.7.6.1 Based on the results of the corrective measures assessment and public meeting, the owner/operator will select a remedial action.

6.7.6.2 Remedies must:

6.7.6.2.1 Be protective of human health and the environment;

6.7.6.2.2 Control source(s) of contaminant releases so as to reduce or eliminate (to the maximum extent practicable) further releases of contaminants that pose a threat to human health or the environment;

6.7.6.2.3 Comply with the site performance standards at the points of compliance (to the extent feasible); and

6.7.6.2.4 Comply with standards for the management of wastes.

6.7.6.3 The Department may determine that remediation of a contaminant release is not necessary if the permittee can demonstrate to the satisfaction of the Department (or the Department certifies that it is satisfied) that the ground water is not currently or reasonably expected to be a source of drinking water, will not migrate so as to threaten a source of drinking water or will not cause violation of surface water quality standards (i.e. does not represent a significant threat to human health or the environment).

6.7.7 Implementation of Corrective Action

6.7.7.1 Based on the schedule established under Section 6.G.5.b. for initiation and remediation of remedial activities, the owner or operator must:

6.7.7.1.1 Implement the corrective action remedy;

6.7.7.1.2 Take any interim measures necessary to ensure protection of human health and the environment (such as replacement of contaminated or imminently threatened water supplies); and

6.7.7.1.3 Perform ground water and/or surface water monitoring to demonstrate the effectiveness of the remedy including whether or not compliance is achieved with the performance standards.

6.7.7.2 If the owner or operator determines, based on information obtained after implementation of the remedy has begun or other information that compliance with remediation objectives (including achievement of performance standards) cannot be practically achieved with the remedy selected, the owner or operator must notify the Department and request authorization to proceed with another feasible method consistent with the overall objective of the remedy.

6.7.7.3 If the permittee determines that compliance with remedial action objectives (Section 6.7.7) cannot be practically achieved, the permittee must notify the Department and implement alternate methods to control exposure of humans or the environment to residual contamination and implement alternative control measures.

6.7.7.4 Remedies selected shall be considered complete when:

6.7.7.4.1 All actions required to implement the remedy have been achieved; and

6.7.7.4.2 The ground water protection standards or alternate requirements agreed upon have been achieved for a period of three years or alternate period approved by the Department.

6.7.7.5 Upon completion of the remedy, the owner or operator must notify the Department that a certification of the remedy has been completed in compliance with the requirement and placed in the operating records. This certification must be signed by a Professional Geologist registered in Delaware.

6.7.7.6 Upon completion of the remedy, the owner or operator will continue ground water monitoring as required by provisions of Section 6.7.3 and approved by the Department.

6.8 Capping System

6.8.1 Requirement for a capping system

6.8.1.1 Upon closure of the landfill or landfill cell the permittee shall install a capping system that will control the emission of gas (if applicable), promote the establishment of vegetative cover, and minimize infiltration and percolation of water into, and prevent erosion of, the waste throughout the postclosure care period.

6.8.1.2 The capping system shall be in place 180 days following final waste disposal activity.

6.8.1.3 The capping system shall extend beyond the edge of the lined area.

6.8.2 Composition of the capping system

The capping system shall consist of at least the following components:

6.8.2.1 A final grading layer on the waste, consisting of at least six (6) inches of soil, to attain the final slope and provide a stable base for subsequent system components. Daily and intermediate cover may be used for this purpose.

6.8.2.2 An impermeable layer, consisting of at least:

6.8.2.2.1 A 30 mil geomembrane underlain by a geotextile, or

6.8.2.2.2 24 inches of clay at a hydraulic conductivity of 1×10^{7} cm/sec or depth of equivalent material having a hydraulic conductivity less than 1×10^{7} cm/sec, such depth to be determined based on the hydraulic conductivity of 24 inches of clay at a hydraulic conductivity of 1×10^{7} cm/sec.

Alternative materials may be used for the impermeable layer with prior written approval of the Department.

6.8.2.3 A final cover consisting of:

6.8.2.3.1 Eighteen (18) inches of soil to provide rooting depth and moisture for plant growth, and

6.8.2.3.2 Six (6) inches of topsoil or other material approved by the Department to support the proposed vegetation; or

6.8.2.3.3 A suitable layer of alternative material or combination thereof to assure adequate rooting and moisture retention to support the proposed vegetation.

The permittee shall propose a suitable vegetation dependent upon the quality and characteristics of the topsoil and compatible with the intended final use of the facility. Maintenance schedules and application rates for fertilizer and mulch shall also be submitted for approval.

6.8.3 Final slopes

6.8.3.1 The grades of the final slope shall be constructed in accordance with the following minimum standards:

6.8.3.1.1 The final grade of the top slope, after allowing for settlement and subsidence, shall be designed to promote runoff;

6.8.3.1.2 The final grades of the side slopes shall be, at a maximum, three horizontal to one vertical (3:1).

6.8.3.2 The top and side slopes shall be maintained to prevent erosion of the capping system and to insure complete vegetation cover.

6.9 Landfill Operation And Maintenance Standards

6.9.1 General

6.9.1.1 Industrial landfills shall be operated so as to create an aesthetically desirable environment and to preclude degradation of land, air, surface water, or ground water.

6.9.1.2 Industrial landfills shall be maintained and operated to conform with the approved Plan of Operation.

6.9.2 Details of operation and maintenance

6.9.2.1 Spreading and compacting

The working face shall be confined to the smallest practical area, as is consistent with the proper operation of trucks and equipment.

The waste shall be spread in layers and compacted by repeated passes of the compacting equipment to obtain the degree of compaction specified in the Solid Waste permit.

6.9.2.2 Cover

Approved cover material shall be applied at a frequency and thickness specified by the Department.

6.9.2.3 Control of nuisances and hazards

Odor: The operation of the landfill shall not result in odors associated with solid waste being detected off site.

Litter: The scattering of refuse and wind-blown litter shall be controlled by the use of portable fences, natural barriers, or other suitable methods. No refuse or litter shall be allowed to migrate off site.

Dust, fires: The landfill shall be operated in a manner which eliminates, to the extent possible, dust problems and fires.

6.9.2.4 Access

Access to the site shall be limited to those persons authorized to use the site for the disposal of solid waste and to those hours when an attendant is on duty. This section shall not be construed to limit right of entry pursuant to 7 **Del.C.** 6024.

Access to the site by unauthorized persons shall be prevented by the use of barriers, fences and gates, or other suitable means.

6.9.2.5 Salvaging

Salvage operations shall be so organized that they will not interfere with the proper disposal of any solid waste. No salvage operation shall be allowed which creates unsightliness, nuisances, health hazards, or potential safety hazards.

6.9.2.6 Personnel

Sufficient numbers and types of personnel shall be available at the site to insure capability for operation in accordance with these regulations.

6.9.2.7 Equipment

Adequate numbers and types of equipment commensurate with the size of the operation shall be available at the site to insure operation of the landfill in accordance with the provisions of these regulations and the plan of operation. Waste handling equipment shall be cleaned routinely and maintained in accordance with the manufacturer's recommendations.

6.9.2.8 Employee health and safety

Employees at the site shall work under all appropriate health and safety guidelines established by the Occupational Safety and Health Administration.

The owner or operator of the landfill shall provide suitable shelter, sanitary facilities, and safe drinking water for personnel at the site.

A reliable telephone or radio communication system shall be provided for site personnel.

First aid equipment shall be available at the site.

6.9.3 Recordkeeping

The following information must be recorded, as it becomes available, and retained by the owner or operator of any new or existing industrial landfill until the end of the postclosure care period of the landfill:

6.9.3.1 Records demonstrating that liners, leachate control systems, cover, capping system, and all monitoring systems are constructed or installed in accordance with the design criteria required in Section 6, Subsections 3,4,5,6,7 and 8,

6.9.3.2 Monitoring, testing, or analytical data where required by Section 6, Subsections 4,5,6,7, and 8,

6.9.3.3 Volume and/or weight of wastes received

6.9.3.4 Any additional records specified by the Department.

6.9.4 Reporting

The permittee shall submit to the Department on an annual basis a report summarizing facility operations for the preceding calendar year. The report shall describe and summarize all solid waste disposal, environmental monitoring, and construction activities conducted within the year covered by the report. The report shall include, but not necessarily be limited to, the following:

6.9.4.1 The volume or tonnage of solid waste landfilled at the facility,

6.9.4.2 The estimated remaining capacity of the facility, in both tonnage and years,

6.9.4.3 Leachate quantity and quality data as required in Section 6.4.4, and in the Solid Waste permit,

6.9.4.4 Gas monitoring data as required in Section 6.5.3, and in the Solid Waste permit,

6.9.4.5 An updated estimate of the cost of closure and postclosure care for the facility, as required in Section 6.10.3.4,

6.9.4.6 Any intentional or accidental deviations from the approved Plan of Operation, and any unusual situations encountered during the year,

6.9.4.7 All construction or corrective work conducted on the site in accordance with approved plans or to achieve compliance with these regulations.

The permittee must also submit any additional reports specified in the Solid Waste permit.

In addition to paper copies of reports, the Department may require all or part of any required report to be submitted on machine-readable media in a format mutually acceptable to the Department and the permittee. With approval of the Department, reports submitted on machine-readable media may be substituted for paper reports.

6.9.5 Prohibitions

6.9.5.1 The owner or operator of an industrial landfill shall not knowingly accept for disposal any hazardous waste.

6.9.5.2 Open burning of any solid waste is prohibited within the active portion of the landfill.

6.9.5.3 Scavenging is prohibited on any landfill site.

6.9.5.4 No wastes other than those specified in the permit may be disposed of at the facility.

6.10 Closure

6.10.1 General

The owner or operator of an industrial landfill must close the completed landfill or landfill cell in a manner that:

6.10.1.1 Minimizes the need for further maintenance, and

6.10.1.2 Minimizes the postclosure escape of solid waste constituents, leachate, and landfill gases to the surface water, ground water, or atmosphere.

6.10.2 Required submittals; notification

6.10.2.1 An owner or operator of a new industrial landfill must submit a conceptual closure plan for the facility at the time of initial (i.e., construction) permit application.

6.10.2.2 At least 180 days prior to the projected date when wastes will no longer be accepted at the landfill or cell, the landfill owner or operator shall submit to the Department written notification of intent to close the facility or cell, a closure plan, and a closure schedule.

6.10.2.3 If the Department determines that the closure plan and closure schedule are sufficient to ensure closure in accordance with the performance standards described in Section 6.10.1, it will modify the solid waste permit to allow closure to take place.

6.10.2.4 The owner or operator shall not commence closure activities before receiving the necessary modifications to the solid waste permit.

6.10.2.5 A copy of the closure plan must be maintained at the facility or at some other location designated by the owner or operator through the postclosure care period of the facility.

The closure plan for an industrial landfill or cell must include, as a minimum, the following:

6.10.3 Closure plan contents

6.10.3.1 A description of the methods, procedures, and processes that will be used to close a landfill and each individual cell thereof in accordance with the closure performance standard in Section 6.10.1.

6.10.3.2 A description of the capping system required under Section 6.8. This shall include a description of the system design, the type of cover to be used, and a discussion of how the capping system will achieve the objectives of Section 6.10.1.

6.10.3.3 A description of other activities necessary to satisfy the closure performance standard, including, but not limited to, the removal or disposal of all nonlandfilled wastes located on site (e.g., wastes from landfill runoff collection ponds).

6.10.3.4 An estimate of the cost of closing the facility or cell and of the cost of postclosure monitoring and maintenance throughout the postclosure care period. These estimates shall be updated yearly and submitted to the Department as part of the annual report described in Section 6.9.4.

6.10.3.5 A plan for postclosure care of the facility sufficient to ensure that the standards described in Section J.1 will be met. This will include:

6.10.3.5.1 A description of the monitoring and maintenance activities required and the frequency at which these activities will be performed.

6.10.3.5.2 The name, address, and telephone number of the person or office to contact about the facility during the postclosure period.

6.10.3.5.3 A description of the planned uses of the property during the postclosure period.

6.10.3.6 A plan for control and/or recovery of landfill gases, if appropriate.

6.10.3.7 A topographical map of the site showing the proposed post-closure elevation with reference to mean sea level.

6.10.3.8 A closure construction quality assurance plan.

6.10.4 Minimum closure requirements

6.10.4.1 The permittee shall notify the Department at least 30 working days prior to commencing closure activities. The Department shall inspect the site, and the permittee shall perform any corrective work which the Department deems necessary.

6.10.4.2 Finished portions of the landfill shall receive a capping system which meets the requirements of Section 6.8.

6.10.4.3 Finished portions of the landfill shall be planted with appropriate vegetation to promote stabilization of the cover.

6.10.4.4 The closure shall be carried out in accordance with the approved closure plan and according to the approved closure schedule. Any significant deviations from the plan or the schedule must be approved by the Department prior to being initiated.

6.10.4.5 Upon closure of an entire landfill, all nonlandfilled wastes located on site shall be removed or disposed of in a manner approved by the Department.

6.10.4.6 After closure of the facility, the site shall be returned to an acceptable appearance consistent with the surrounding area and the intended use of the land.

6.10.4.7 When closure of the landfill or landfill cell is completed, the owner or operator shall submit a final report for the Department's approval. The final report shall certify that the closure of the landfill or cell was completed in accordance with the closure plan to include the construction quality assurance plan, construction and material specifications, and design drawings. The final report shall be certified correct by the construction quality assurance engineer, who must be a Professional Engineer registered in Delaware. The landfill or cell will not be considered closed until the Department has provided its written notification that the closure construction and the final report meet the requirements of the solid waste permit and these regulations. The Department will inspect the cell or facility and will either:

6.10.4.7.1 Issue a letter of approval to certify that the site has been closed in accordance with the solid waste permit, the closure plan, and all applicable regulations; or

6.10.4.7.2 Determine that the site is not in compliance with the solid waste permit, the closure plan, or applicable regulations; identify the areas of deficiency; and require the owner or operator to take the necessary actions to bring the site into compliance.

6.10.4.8 Facilities entering the post-closure period will be issued a post-closure permit based upon the approved post-closure plan, monitoring requirements, gas and leachate control, maintenance and corrective actions (if required).

6.11 Postclosure Care

6.11.1 General

6.11.1.1 The owner or operator of an industrial landfill must continue postclosure care for 30 years after the completion of closure.

6.11.1.2 At any time during the postclosure care period the Department may remove one or more of the postclosure care requirements described in Section 6, Subsection 11.2 below if it determines that the requirement(s) is/are no longer necessary for the protection of human health and the environment.

6.11.1.3 At any time after the first five years of the postclosure care period, the Department may reduce the length of the postclosure care period or terminate postclosure care if it determines that such care is no longer necessary.

6.11.1.4 Prior to the time that the postclosure care period is due to expire, the Department may extend the postclosure care period if it determines that the extended period is necessary to protect human health and the environment.

6.11.1.5 If at any time during the postclosure care period there is evidence of a contaminant release from the landfill that presents a significant threat to human health or the environment, action to mitigate the threat will be required of the owner or operator of the facility.

6.11.2 Minimum postclosure care requirements

Postclosure care shall be in accordance with the post-closure permit and shall consist of at least the following:

6.11.2.1 Maintaining the integrity and effectiveness of the capping system, including making repairs as necessary to correct the effects of settling, subsidence, erosion, or other events, and preventing runon and runoff from eroding or otherwise damaging the cap.

6.11.2.2 Reseeding the cover if insufficient vegetation exists to stabilize the surface.

6.11.2.3 Maintaining and operating the leachate collection and treatment systems until the Department determines that the leachate no longer poses a threat to human health or the environment. The permittee shall submit leachate quantity and quality data to the Department for those parameters and at such frequencies as specified by the Department.

6.11.2.4 Maintaining and operating the ground water monitoring system in accordance with Section 6.7. The permittee shall submit ground water quality data as specified by the Department.

6.11.2.5 Maintaining and monitoring the gas control system in accordance with Section 6.5 and the closure plan. The permittee shall submit gas data as specified by the Department.

6.11.2.6 Maintaining and monitoring the surface water management system in accordance with Section 6.6.

6.11. 3 Prohibitions

6.11.3.1 Standing water shall not be allowed on the closed landfill.

6.11.3.2 Open burning shall not be allowed on the closed landfill.

6.11.3.3 Unless approved in advance by the Department, no activity shall be conducted on a closed landfill which will disturb the integrity of the capping system, liner, containment system, or monitoring systems.

6.11.3.4 Access to the closed landfill shall be limited to those persons who are engaging in activities which are compatible with the intended postclosure use of the site.

6.11.4 Postclosure land use

The owner or operator shall implement the postclosure land use plan approved by the Department.

6.11.5 Notice in Deed to Property

6.11.5.1 The owner of the property on which an industrial landfill is located must record ~~a notation on the deed to the facility property, or some other instrument that is normally examined during title search,~~ an environmental covenant, per **Delaware Code** Title 7, Chapter 79, Subchapter II, with the deed to the facility property that will in perpetuity notify any potential purchaser of the property:

6.11.5.1.1 The land has been used as a solid waste disposal site, and

6.11.5.1.2 The use of land is restricted under this regulation.

6.11.5.2 Included with the notation shall be a map or description clearly specifying the area that was used for disposal.

8 DE Reg. 354 (8/1/04)

(Break in Continuity of Sections) (Go to section 11.0)

7.0 Transporters

7.1 General Provisions (applicable to all persons transporting solid waste in Delaware)

7.1.1 No person shall transport solid waste, without first having obtained a permit from the Department, unless specifically exempted by these Regulations. Refer to Section 4 of these Regulations, PERMIT REQUIREMENTS AND ADMINISTRATIVE PROCEDURES.

7.1.2 Any vehicle used to transport solid waste shall be so constructed or loaded as to prevent its contents from dropping, sifting, leaking, or otherwise escaping therefrom, in accordance with 21 **Del.C.** 4371

7.1.3 The transporter will be responsible for all costs of cleaning up a discharge of solid waste from the vehicle.

7.1.4 Compliance with these regulations does not release a transporter from the obligation of complying with any other applicable laws, regulations or ordinances.

Additional waste transporter regulations may apply to transporters of special wastes, e.g. infectious waste. Refer to Section 11 of these Regulations, SPECIAL WASTES MANAGEMENT.

7.1.5 Each vehicle used to transport solid waste and required to have a transporter's permit must carry a copy of the permit in the vehicle. The permit must be presented upon request to any law enforcement officer or any representative of the Department.

7.1.6 A written request to transfer a permit must be received 90 days prior to the date of the proposed transfer. For permit transfer procedures, refer to Section 4.1.8 of these Regulations, PERMITTING.

7.1.7 Permitted solid waste transporters shall not use agents or subcontractors who do not hold permits for transporting solid waste.

7.2 Provisions Applicable To Transporters (Except For Transporters Of Only Dry Waste) Required To Have A Solid Waste Transporter's Permit

7.2.1 Applicability

Section 7.2 applies to all transportation activities in Delaware except the following:

7.2.1.1 Transportation of source separated materials for reuse or recycling, provided that the materials remain separate throughout the journey and are not recombined for transport.

7.2.1.2 Transportation of household waste generated in a Delaware residence and transported by the generator of the household waste.

7.2.1.3 On-site transportation of solid waste (i.e., the point of generation and the point of treatment or disposal are on the same site and the vehicle transporting the solid waste will not at any time leave the site).

7.2.1.4 Transportation of solid waste in a vehicle having a gross vehicle weight less than or equal of 26,000 (twenty-six thousand) pounds. (This exclusion shall not apply to the transportation of infectious waste or waste containing asbestos.) For information concerning infectious waste vehicle requirements, refer to Section 11 of these Regulations SPECIAL WASTES MANAGEMENT, Part 1, - Infectious Waste.

7.2.1.5 Transportation of dry waste only (this activity is subject to the provisions of Subsection 7.3).

7.2.1.6 Transportation of solid waste generated on a farm in Delaware and transported by the generator of the waste (this exclusion shall not apply to the transportation of infectious waste, petroleum-hydrocarbon contaminated soils, or waste containing asbestos).

7.2.2 Instruction and Training

All drivers of solid waste transportation vehicles, and all of the transporter's employees who may handle solid waste subject to these regulations, shall receive instruction in how to perform transportation duties in a way that ensures compliance with all applicable regulations and requirements. The instruction shall include, but not necessarily be limited to, the following:

7.2.2.1 Knowledge of current DOT Motor Carrier Safety Regulations.

7.2.2.2 Safe vehicle operations to avoid creating hazards to human health, safety, welfare, or the environment.

7.2.2.3 Knowledge of proper handling procedures for the type of solid waste being transported.

7.2.2.4 Familiarity with the approved accidental discharge containment plan.

7.2.2.5 Familiarity with the conditions of the solid waste transporter's permit.

It shall be the responsibility of the transporter to ensure that all drivers and other employees that may handle solid waste receive instruction as described above as frequently as necessary to maintain a level of knowledge that will ensure safe operation of the vehicle during transportation of the solid waste and proper management of an accidental discharge. A description of the driver training program shall be included with the permit application.

7.2.3 Vehicle Requirements

7.2.3.1 All vehicles used in the transportation of solid waste shall be operated and maintained so as to be in compliance with all state and federal regulations and not present a hazard to human health or the environment through unsafe vehicle conditions. The permittee is responsible for the operation and maintenance of all vehicles including leased vehicles operated under his/her permit.

7.2.3.2 All vehicles must carry safety and emergency equipment in accordance with applicable DOT regulations to ensure protection of the public and the environment.

7.2.3.3 All vehicles must carry spill containment materials appropriate to the type of solid waste being transported.

7.2.3.4 Each vehicle engaged in the transportation of solid waste must be fully enclosed or covered to prevent the discharge or release of solid waste to the environment.

7.2.3.5 The transporter's name shall be prominently displayed on both sides of the vehicle in figures at least three inches high and of a color that contrasts with the color of the vehicle.

7.2.3.6 The transporters' permit number shall be prominently displayed on both sides and the rear of the vehicle in figures at least three inches high and of a color that contrasts with the color of the vehicle.

7.2.4 Proof of Financial Responsibility

Proof of financial responsibility for sudden and accidental discharges shall be maintained by the transporter. This financial responsibility may be established by any one or a combination of the following:

7.2.4.1 Automobile liability insurance

7.2.4.1.1 For-hire carriers in interstate commerce shall at all times maintain insurance coverage that is in compliance with 49 CFR Part 387 and shall submit a Certificate of Insurance with MCS-90 endorsement demonstrating compliance with this regulation.

7.2.4.1.2 Transporters who transport bulk liquid or bulk gaseous industrial waste, shall at all times maintain commercial automobile liability insurance with a combined single limit of at least $750,000 with MCS-90 endorsement and shall submit a Certificate of Insurance with MCS-90 endorsement demonstrating compliance with this regulation.

7.2.4.1.3 Transporters who transport infectious waste in interstate commerce shall at all times maintain commercial automobile liability insurance with a combined single limit of at least $1,000,000 with MCS-90 endorsement. Transporters who transport infectious waste in intrastate commerce shall at all times maintain commercial automobile liability insurance with a combined single limit of at least $750,000 with MCS-90 endorsement. Infectious waste transporters shall submit a Certificate of Insurance with MCS-90 endorsement demonstrating compliance with this regulation.

7.2.4.1.4 All other carriers shall at all times maintain commercial automobile liability insurance with a combined single limit of at least $350,000 and shall submit a Certificate of Insurance demonstrating compliance with this regulation.

7.2.4.2 Self insurance equal to or exceeding the above automobile liability insurance limits, and approved by the Department.

7.2.4.3 Other proof of financial responsibility approved by the Department.

7.2.5 Management of Accidental Discharges

7.2.5.1 All applicants for a permit to transport solid waste shall submit to the Department a plan for the prevention, control, and cleanup of accidental discharges of the solid waste. No permit will be issued to a transporter until such a plan has been submitted to and approved by the Department.

7.2.5.2 A copy of the plan shall be maintained in each vehicle engaged in the transportation of solid waste.

7.2.5.3 All accidental discharges of solid waste from a vehicle shall be immediately and completely remediated. If the solid waste cannot be immediately and completely remediated, or if it has the potential to cause damage to the environment or to public health, the discharge shall be immediately reported to the Department. (Accidental discharges of infectious waste are regulated under Section 11, Part 1)

7.2.5.4 The transporter will be responsible for all costs of remediating a discharge of solid waste from the vehicle.

7.2.6 Recordkeeping

The following records must be retained by the transporter for at least three years:

7.2.6.1 The solid waste transporter's permit.

7.2.6.2 Documentation of the training provided to drivers.

7.2.6.3 Insurance documents sufficient to demonstrate compliance with Section 7.2.4 of these regulations.

7.2.6.4 Records of spills or releases of solid waste that exceed five (5) pounds or one (1) cubic foot that occur during the transportation of solid waste in Delaware, and descriptions of the remedial actions taken.

7.2.6.5 The transporter's annual report required under Section 7.2.7.

7.2.7 Reporting and Documentation

7.2.7.1 Each transporter that picks up and/or deposits solid waste in Delaware shall submit an annual report on a form provided by the Department, summarizing information from the preceding calendar year. This report shall be submitted to the Department by April 1 of the year following the year covered by the report. The information contained in the report shall include, but not be limited to, the following:

7.2.7.1.1 Types and weights of solid waste transported in, into, or out of the state.

7.2.7.1.2 Actual amounts of solid waste by weight and type delivered to each destination when transported to or from facilities equipped with truck scales. Amounts may be estimated only when truck scales are not available during the waste transportation process.

7.2.7.1 Any vehicle transporting solid waste through Delaware shall carry documentation indicating the state in which the solid waste was picked up, the date on which it was picked up, and the state in which it will be deposited.

7.3 Provisions Applicable To Transporters Of Only Dry Waste Required To Have A Solid Waste Transporters Permit

7.3.1 General

No transporter granted a permit to transport only dry waste under the requirements of this Subsection (7.3.) shall transport any solid waste other than dry waste, as defined in these Regulations, without meeting the additional requirements for transporting such other solid waste contained in these Regulations.

7.3.2 Applicability

The remainder of this Subsection (7.3) applies to all transportation activities involving only dry waste in Delaware except the following:

7.3.2.1 Transportation of dry waste by a solid waste transporter permittee having a permit issued under Subsection 7.2 of these Regulations.

7.3.2.2 Transportation of source separated materials for reuse or recycling, provided that the materials remain separate throughout the journey and are not recombined for transport.

7.3.2.3 Transportation of dry waste generated in a Delaware residence and transported by the generator of the dry waste.

7.3.2.4 On-site transportation of dry waste (i.e., the point of generation and the point of treatment or disposal are on the same site and the vehicle transporting the dry waste will not at any time leave the site).

7.3.2.5 Transportation of dry waste in a vehicle having a gross vehicle weight less than or equal to 26,000 (twenty-six thousand) pounds. (This exclusion shall not apply to the transportation of infectious waste or of waste containing asbestos.) For information concerning infectious waste vehicle requirements, refer to Section 11 of these Regulations, SPECIAL WASTES MANAGEMENT, Part 1 – Infectious Waste.

7.3.3 Vehicle Requirements

7.3.3.1 The transporter's name shall be prominently displayed on both sides of the vehicle in figures at least three inches high and of a color that contrasts with the color of the vehicle.

7.3.3.2 The transporter's permit number shall be prominently displayed on both sides and the rear of the vehicle in figures at least three inches high and of a color that contrasts with the color of the vehicle.

7.3.4 Proof of Financial Responsibility

Proof of financial responsibility for sudden and accidental discharges shall be maintained by the transporter. This financial responsibility may be established by any one or a combination of the following:

7.3.4.1 Automobile liability insurance

7.3.4.1.1 For-hire carriers in interstate commerce shall at all times maintain insurance coverage that is in compliance with 49 CFR Part 387 and shall submit a Certificate of Insurance with MCS-90 endorsement demonstrating compliance with this regulation.

7.3.4.1.2 Transporters who transport bulk liquid or bulk gaseous industrial waste, shall at all times maintain commercial automobile liability insurance with a combined single limit of at least $750,000 with MCS-90 endorsement and shall submit a Certificate of Insurance with MCS-90 endorsement demonstrating compliance with this regulation.

7.3.4.1.3 Transporters who transport infectious waste in interstate commerce shall at all times maintain commercial automobile liability insurance with a combined single limit of at least $1,000,000 with MCS-90 endorsement. Transporters who transport infectious waste in intrastate commerce shall at all times maintain commercial automobile liability insurance with a combined single limit of at least $750,000 with MCS-90 endorsement. Infectious waste transporters shall submit a Certificate of Insurance with MCS-90 endorsement demonstrating compliance with this regulation.

7.3.4.1.4 All other carriers shall at all times maintain commercial automobile liability insurance with a combined single limit of at least $350,000 and shall submit a Certificate of Insurance demonstrating compliance with this regulation.

7.3.4.2 Self insurance equal to or exceeding the above automobile liability insurance limits, and approved by the Department.

7.3.4.3 Other proof of financial responsibility approved by the Department.

7.3.5 Recordkeeping

The following records must be retained by the transporter for at least three years:

7.3.5.1 The dry waste transporter's permit.

7.3.5.2 The transporter's Annual Report required under Section 7.3.5.

7.3.6 Reporting and Documentation

7.3.6.1 Each transporter that picks up and/or deposits dry waste in Delaware shall submit an annual report on a form provided by the Department, summarizing information from the preceding calendar year. This report shall be submitted to the Department by April 1 of the following year covered by the report. The information contained in the report shall include, but not be limited to, the following:

7.3.6.1.1 The weights of dry waste transported in, into, or out of the state during the year.

7.3.6.1.2 Actual amounts of solid waste by weight and type delivered to each destination when transported to or from facilities equipped with truck scales. Amounts may be estimated only when truck scales are not available during the waste transportation process.

7.3.6.2 Any vehicle transporting dry waste through Delaware shall carry documentation indicating the state in which the dry waste was picked up, the date on which it was picked up, and the state in which it will be deposited.

8 DE Reg. 354 (8/1/04)

8.0 Reserved

9.0 Resource Recovery Facilities

9.1 Applicability

This section applies to:

9.1.1 Materials recovery facilities, and

9.1.2 Thermal recovery facilities.

9.2 Siting

9.2.1 Resource recovery facilities shall be located only in areas where the potential for degradation of the quality of air, land, and water is minimal.

9.2.2 No new resource recovery facility shall be located in an area such that solid waste would at any time be handled:

9.2.2.1 Within the 100 year flood plain.

9.2.2.2 Within any state or federal wetland.

9.2.2.3 Within 1000 feet of any state or federal wildlife refuge, wildlife area, or park.

9.2.2.4 So as to be in conflict with any locally adopted land use plan or zoning requirement.

In addition, any facility that processes municipal solid waste shall not be located within 10,000 feet of any airport currently used by turbojet aircraft or 5,000 feet of any airport runway currently used by pistontype aircraft, unless a waiver is granted by the Federal Aviation Administration.

9.3 Design And Construction

9.3.1 Applicants wishing to construct and operate resource recovery facilities will be encouraged to design the facilities so that they are capable of removing and recycling those materials for which recycling is currently technically and economically feasible. The design should allow for future alteration or upgrading to accomplish removal of additional materials as recycling of these materials becomes feasible.

9.3.2 The plans and specifications for a proposed resource recovery facility shall be prepared and certified by a Professional Engineer registered in Delaware and shall be submitted as a part of the Solid Waste Management Facility permit application.

9.3.3 Construction and installation activities for new facilities shall be carried out in accordance with a third party quality assurance plan approved by the Department. Expansions or alterations of existing facilities shall be carried out in accordance with an approved third-party quality assurance plan if deemed necessary by the Department.

9.3.4 Minimum design requirements

9.3.4.1 All new resource recovery facilities shall be designed to include the following features, as a minimum:

9.3.4.1.1 A setback area with appropriate screening.

9.3.4.1.2 A means to detect explosion potential and equipment designed to minimize the impact of explosion (if the solid waste to be handled and the equipment to be used have the potential of causing explosion).

9.3.4.1.3 A means for maintaining quality control of recovered materials.

9.3.4.1.4 Storage capacity for a minimum of three days of storage (at maximum anticipated loading rates) of incoming solid waste, facility process solid waste residues and effluents, and recovered materials. The storage areas must be within enclosed structures if deemed necessary by the Department.

9.3.4.1.5 Tipping floors, sorting pads, and solid waste storage areas constructed of material capable of withstanding heavy vehicle usage and of reducing and controlling runoff.

9.3.4.1.6 A completely enclosed unloading area, if deemed necessary by the Department.

9.3.4.1.7 Adequate floor drains graded to facilitate washdown and to prevent standing water. Drains shall discharge to a sanitary sewer system, holding tank, or appropriate treatment facility.

9.3.4.1.8 Surface water and erosion controls.

9.3.4.1.9 An auxiliary power system sized to enable emergency shut down of the facility to occur without causing irreparable damage to the equipment.

9.3.4.1.10 Control mechanisms to minimize and contain accidental spillage of reagents, lubricants, or other liquids used as well as residues generated.

9.3.4.1.11 A fire detection and protection system capable of detecting, controlling, and extinguishing any fires that may occur as a result of facility operation.

9.3.4.1.12 A fence or other security system that will prevent access to the site by unauthorized persons.

9.3.4.1.13 A means for weighing or measuring all incoming solid waste, all recyclable materials recovered from the waste, and all residues generated at the facility.

9.4 Operation And Maintenance Standards

All new and existing resource recovery facilities shall comply with this section.

9.4.1 General

9.4.1.1 Facilities shall be operated in a manner that will preclude degradation of land, air, surface water, or ground water.

9.4.1.2 All facilities shall be operated and maintained to conform with the approved Plan of Operation submitted at the time of permit application and approved by the Department.

9.4.2 Details of operation and maintenance

9.4.2.1 Unloading of solid waste

Unloading of solid waste shall take place only at clearly marked unloading areas.

9.4.2.2 Storage and handling

9.4.2.2.1 External storage of solid waste containing garbage is prohibited. No solid waste shall be stored in such a manner that the storage area or the solid waste becomes a nuisance or endangers human health or the environment.

9.4.2.2.2 All solid waste passing through the facility must ultimately be recycled or be disposed of at a solid waste facility authorized to accept that type of solid waste.

9.4.2.2.3 Solid waste delivered to the facility shall be processed within the time limit specified by the Department.

9.4.2.2.4 Nonputrescible recyclable materials may be stored for up to 30 days. The storage period may be increased, with written approval of the Department, if all of the following conditions are met:

9.4.2.2.4.1 there is a demonstrated need to do so (e.g., a market agreement with terms of receipt based on greater than 30 day intervals or volumes that may take longer than 30 days to acquire);

9.4.2.2.4.2 there is sufficient Department approved storage area;

9.4.2.2.4.3 an inventory methodology is used to ensure that the recyclables do not remain on the site for longer than the specified time period; and

9.4.2.2.4.4 the inventory methodology is provided to and approved by the Department before storage begins.

9.4.2.3 Control of nuisances and hazards

Litter: The permittee shall provide for routine maintenance and general cleanliness of the entire site, as well as litter removal along roads approaching the site.

Air Pollution: The operation of the facility shall comply with 7 **Del.C.** Ch. 60, and with the Regulations Governing the Control of Air Pollution.

Vectors: The permittee shall implement a vector control plan to prevent the establishment of habitats for nuisance organisms (e.g., flies, maggots, roaches, rodents, and similar vermin) and to mitigate nuisances and hazards to human health and the environment.

Fire: Equipment shall be available on site to control fires, and arrangements shall be made with the local fire protection agency to provide immediate services when needed.

If deemed necessary by the Department, a separate area shall be provided for temporary placement of hot loads received at the facility. The hot load area shall be located away from trees, bushes, and structures, and loads shall be extinguished immediately upon unloading.

9.4.2.4 Access

Access roads to the point of solid waste discharge shall be designed, constructed, and maintained so that traffic will flow smoothly and will not be interrupted by inclement weather.

Access to the site shall be limited to those times when an attendant is on duty and to those persons authorized to deliver solid waste to the site. This section shall not be construed to limit right of pursuant to 7 **Del.C.** 6024.

9.4.2.5 Personnel

Sufficient types and numbers of trained personnel shall be available at the site to insure capability for operation in accordance with these regulations.

The facility shall be operated under the close supervision of an individual who is thoroughly familiar with the requirements and operational procedures of the facility and is experienced in matters of solid waste management.

All thermal recovery facilities shall be operated under the direct supervision of an individual who has successfully completed a training course on use of the specific equipment installed at the facility.

9.4.2.6 Health and safety

Employees at the site shall work under all appropriate health and safety guidelines established by the Occupational Safety and Health Administration.

First aid equipment shall be available at the site.

9.4.2.7 Equipment

Adequate numbers and types of equipment commensurate with the size of the operation shall be available at the site to insure operation of the facility in accordance with the provisions of these regulations and the plan of operation. All solid waste handling equipment shall be cleaned routinely and maintained according to the manufacturer's recommendations.

All processing equipment shall be operated by persons thoroughly trained in the proper operation of the equipment and shall be maintained in good working order.

9.4.2.8 Disposal of process residues and of solid waste that cannot be processed by the facility

9.4.2.8.1 Unless specified otherwise in writing by the Department, all residues generated by the operation of a facility shall, within three days of generation, be disposed of, used, or treated in a manner that is consistent with state and federal regulations.

9.4.2.8.12 Unless specified otherwise in writing by the Department, all solid waste that is delivered to the facility but that cannot be processed at the facility shall, within three days of receipt, be removed from the facility for disposal, use, or treatment in a manner that is consistent with state and federal regulations.

9.4.3 Recordkeeping

The following information must be recorded in a timely manner and the records retained by the owner or operator for at least three years:

9.4.3.1 Types and weight or volume of solid waste received.

9.4.3.2 Weight or volume of each material recycled or marketed.

9.4.3.3 A record of the commercial solid waste haulers (company name, address, and telephone number) using the facility, and the type and weight or volume of solid waste delivered by each hauler to the facility each day.

9.4.3.4 Process monitoring data.

9.4.3.5 Characterization testing of recyclable materials.

9.4.3.6 Weight or volume of unprocessable solid wastes and of process residues, and location of ultimate disposal of these materials.

9.4.3.7 Characterization testing of process residues to determine the quality for possible marketing or BTU value.

9.4.3.8 A record of fires, spills, and uncontrolled releases that occur at the facility, and of hot loads received.

9.4.3.9 Documentation of training provided to employees.

9.4.3.10 Fire and safety inspections.

9.4.3.11 Major equipment maintenance.

9.4.3.12 Any additional records specified by the Department.

9.4.4 Reporting

9.4.4.1 The permittee shall submit to the Department on an annual basis a report summarizing facility operations for the preceding calendar year. The report shall be on a form prescribed by the Department and shall describe and summarize all solid waste processing, environmental monitoring, and construction activities conducted within the year covered by the report. The report shall include, but not necessarily be limited to, the following:

9.4.4.1.1 Types and weight or volume of solid waste received.

9.4.4.1.2 Weight or volume of each material recycled or marketed, and identification of the markets.

9.4.4.1.3 Weight or volume of unprocessable solid wastes and of process residues, and location of ultimate disposal of these materials.

9.4.4.1.4 A complete list of commercial haulers that delivered solid waste to the facility during the year.

9.4.4.1.5 A discussion of the feasibility of recycling materials that are currently being received at the facility but are not being recycled.

9.4.4.1.6 Descriptions of any intentional or accidental deviations from the approved Plan of Operation.

9.4.4.1.7 Descriptions of all construction or corrective work conducted on the site in accordance with approved plans or to achieve compliance with these regulations.

9.4.4.1.8 Results of characterization testing of recyclable materials and process residues.

9.4.4.1.9 Any additional information specified by the Department.

9.4.4.2 The permittee shall immediately notify the Department if any of the following occurs:

9.4.4.2.1 A shut down that results in solid waste being diverted from the facility.

9.4.4.2.2 A fire.

9.4.4.2.3 A spill or nonpermitted release.

9.5 Closure

9.5.1 General

When a resource recovery facility ceases accepting solid waste, all of the solid waste on site shall be removed and the facility shall be closed in a manner that will eliminate the need for further maintenance at the site.

9.5.2 Required submittals; notification

9.5.2.1 An owner or operator of a resource recovery facility must submit a conceptual closure plan at the time of initial application for a Solid Waste Management Facility Permit.

9.5.2.2 At least 180 days prior to the projected date when solid waste will no longer be accepted at the facility, the owner or operator shall submit to the Department all of the items listed in Section 4.4.3. Closure activities shall not commence until the Department has:

given public notice regarding the closure activity and the opportunity for a public hearing as provided in 7 **Del.C.** Ch. 60,

approved in writing an updated closure plan and closure schedule**.**

For additional information on the public notice procedure see section 4.1.2 of these regulations.

9.5.2.3 A copy of the closure plan must be maintained at the facility or at some other location designated by the owner or operator until closure has been completed.

9.5.3 Closure plan contents

The closure plan for a resource recovery facility must include, as a minimum, the following:

9.5.3.1 A description of the methods, procedures, and processes that will be used to close the facility, including provisions that will be made for the proper disposal of all solid waste that is on the site when operations cease.

9.5.3.2 An estimate of the cost of closing the facility. This estimate shall be updated yearly and submitted to the Department as a part of the annual report described in Section 9.4.4.

9.5.3.3 A description of the planned postclosure use of the property.

9.5.4 Minimum closure requirements

9.5.4.1 Closure shall be carried out in accordance with the approved closure plan.

9.5.4.2 Closure must be complete within one year after the date on which the Department issued the approved closure plan and closure schedule.

9.5.4.3 When closure is completed, the owner or operator must submit to the Department certification by a Professional Engineer registered in Delaware that the facility has been closed in accordance with the specifications in the approved closure plan.

9.5.4.4 When closure has been completed to the satisfaction of the Department, the Department will issue a letter indicating that closure has occurred in accordance with the closure plan.

9.5.4.5 After closure has been completed, the Department may require that the permittee conduct monitoring and/or maintenance activities at the site to prevent or detect and mitigate any adverse environmental or health impacts.

8 DE Reg. 354 (8/1/04)

10.0 Transfer Stations

10.1 General Provisions

10.1.1 Applicability

10.1.1.1 This section applies to all solid waste transfer stations in Delaware. Additional requirements may apply to transfer stations handling special solid wastes, such as infectious waste.

10.1.1.2 Compliance with these regulations does not release the owner or operator of a transfer station from the obligation of complying with any other applicable laws, regulations, or ordinances.

10.1.2 Exclusions

The following types of facilities are not considered to be transfer stations:

10.1.2.1 Facilities that accept only source separated materials for the purpose of recycling those materials.

10.1.2.2 Facilities permitted as materials recovery facilities.

10.1.2.3 Small load collection areas located at permitted landfill sites.

10.1.2.4 Individual dumpsters used for waste generated on site (e.g., at shopping centers, apartment complexes or commercial establishments).

10.1.2.5 Compaction equipment being used exclusively for solid waste generated on site (e.g., in office or apartment complexes, industrial facilities, or shopping centers).

10.1.2.6 Temporary debris collection and reduction sites established by Delaware Emergency Management Authority (DEMA) as the result of a natural or man-made disaster event. The exclusion shall apply provided the sites are established in accordance with the applicable DEMA Debris Management Plan, and meet the substantive requirements of this section. The exclusion shall last no longer than ninety (90) days from the start of accumulation of wastes at the temporary debris collection and reduction site. A written record shall be required to document accumulation of debris at each site.

10.2 Siting

10.2.1 Transfer stations shall be located only in areas where the potential for degradation of the quality of air, land, and water is minimal.

10.2.2 Transfer stations shall be located adjacent to access roads capable of withstanding anticipated load limits.

10.2.3 No new transfer station shall be located in an area such that solid waste would at any time be handled:

10.2.3.1 Within the 100-year flood plain.

10.2.3.2 Within any state or federal wetland.

10.2.3.3 So as to be in conflict with any locally adopted land use plan or zoning requirement.

10.3 Design

10.3.1 General

The plans and specifications for a proposed transfer station shall be prepared and certified by a Professional Engineer registered in Delaware and shall be submitted as a part of the transfer station permit application.

10.3.2 Minimum design requirements

All transfer stations shall be designed to include at least the following:

10.3.2.1 A leachate collection and disposal system as described in Section 10.D.

10.3.2.2 A means for weighing or measuring all solid waste handled at the facility.

10.3.2.3 Tipping and loading areas contained within structures capable of preventing the development of nuisance conditions (e.g., odors, litter, dust, rodents, insects) if these areas will be within 300 feet of a commercial, institutional, or residential structure that is designed for human occupancy and that is in existence at the time of initial permit application. If tipping and loading areas will not be within 300 feet of a structure designed for human occupancy, the permittee shall evaluate the impact to the surrounding area of handling the solid waste in a nonenclosed facility. In addition, the permittee shall evaluate the need for exhaust systems in enclosed areas and shall install such systems if necessary for the protection of human health.

10.3.2.4 A means to prevent vehicles from backing into the pit while unloading.

10.3.2.5 Onsite roads designed to accommodate projected traffic flow in a safe and efficient manner.

10.3.2.6 Separate access for passenger vehicles, if both commercial and passenger vehicles are using the facility.

10.3.2.7 A fence or other security system that will prevent access to the site by unauthorized persons.

10.4 Leachate Collection And Disposal

10.4.1 All transfer stations shall be designed and constructed to include a leachate collection and disposal system that will prevent leachate (including wastewater generated during normal operation

such as washout and cleaning of equipment, trucks, and floors) from contaminating the soil, surface water, or ground water.

10.4.2 The leachate collection and disposal system must be approved in advance by the Department and shall consist of one, or a combination, of the following:

10.4.2.1 Tipping, loading, and unloading areas constructed of impervious material and equipped with drains connected to either:

10.4.2.1.1 a sanitary sewer system, or

10.4.2.1.2 a corrosion resistant holding tank.

If the tipping, loading, and unloading areas are not enclosed, the piping and drains to the sewer system or holding tank shall be sized to handle, at a minimum, the runoff that would result from a 2-hour 10-year storm.

10.4.2.2 Containers and compaction units constructed of durable impervious material and equipped with covers that will minimize the entrance of precipitation.

Alternate designs may be used with prior written approval of the Department if the applicant can show that they will prevent leachate from contaminating the soil, surface water, and ground water.

10.5 Operation And Maintenance Standards

10.5.1 General

10.5.1.1 Transfer stations shall be operated in a manner that will preclude degradation of land, air, surface water, or ground water.

10.5.1.2 Transfer stations shall be maintained and operated to conform with the Plan of Operation submitted at the time of permit application and approved by the Department.

10.5.2 Details of operation and maintenance

10.5.2.1 Storage of solid waste

Solid waste shall not remain at the transfer station for more than 72 hours without the written approval of the Department. Any solid waste that is to be kept at the site overnight shall be stored in an impervious enclosed structure.

10.5.2.2 Disposition of solid waste leaving the facility

All solid waste accepted at the transfer station must, upon leaving the transfer station, be delivered to a processing or disposal facility authorized by the Department (or by the appropriate environmental agency, if outside of Delaware) to accept that type of waste.

10.5.2.3 Control of nuisances and hazards

Litter

The permittee shall provide for routine maintenance and general cleanliness of the entire site, as well as litter removal along roads approaching the site if accumulations of litter along the approach roads are clearly the result of the operation of the transfer station.

Vectors

The permittee shall implement a vector control plan to prevent the establishment of habitats for nuisance organisms (e.g., flies, maggots, roaches, rodents, and similar vermin) and to mitigate nuisances and hazards to human health and the environment.

Air Pollution

The operation of the transfer station shall comply with 7 **Del.C.** Ch. 60 and the Regulations Governing the Control of Air Pollution.

Fire

Equipment shall be available on site to control fires, and arrangements shall be made with the local fire protection agency to provide immediate services when needed.

If deemed necessary by the Department, a separate area shall be provided for temporary placement of hot loads received at the facility. The hot load area shall be located away from trees, bushes, and structures, and loads shall be extinguished immediately upon unloading.

10.5.2.4 Access

Access to the site shall be limited to those times when an attendant is on duty and to those persons authorized to use the site for the disposal of solid waste. This section shall not be construed to limit right of entry pursuant to 7 **Del.C.** 6024.

10.5.2.5 Personnel

Sufficient numbers and types of personnel shall be available at the site to insure capability for operation in accordance with these regulations.

10.5.2.6 Health and safety

Employees at the site shall work under all appropriate health and safety guidelines established by the Occupational Safety and Health Administration.

First aid equipment shall be available at the site.

10.5.2.7 Equipment

Adequate numbers and types of equipment commensurate with the size of the operation shall be available at the site to insure operation of the facility in accordance with the provisions of these regulations and the plan of operation. All waste handling equipment shall be cleaned routinely and maintained according to the manufacturer's recommendations.

10.5.3 Recordkeeping

The following information must be recorded in a timely manner and the records retained by the owner or operator for at least three years:

10.5.3.1 A record of the solid waste commercial haulers (company name, address, and telephone number) using the facility and the type and weight or volume of solid waste delivered by each hauler to the transfer station each day.

10.5.3.2 A record of the type and weight or volume of solid waste delivered from the transfer station to its final destination each day.

10.5.3.3 A record of fires, spills, and uncontrolled releases that occur at the facility, and of hot loads received.

10.5.3.4 Fire and safety inspections.

10.5.3.5 Major equipment maintenance.

10.5.3.6 Destination of the solid waste.

10.5.4 Reporting

10.5.4.1 The permittee shall submit to the Department on an annual basis a report summarizing facility operations for the preceding calendar year. The due date for this annual report will be specified in the facility's permit. The report shall be on a form acceptable to the Department and shall describe and summarize all environmental monitoring and construction activities conducted within the year covered by the report. The report shall include, but not necessarily be limited to, the following:

10.5.4.1.1 Type and weight or volume of waste received.

10.5.4.1.2 A complete list of commercial haulers that hauled waste to or from the facility during the year covered by the report.

10.5.4.1.3 Destination of the solid waste and the type and weight or volume of waste delivered to the destination.

10.5.4.1.4 Descriptions of any intentional or accidental deviations from the approved Plan of Operation.

10.5.4.1.5 Descriptions of all construction or corrective work conducted on the site in accordance with approved plans or to achieve compliance with these regulations.

10.5.4.1.6 An updated estimate of the cost of closing the facility.

10.5.4.1.7 Any additional information specified by the Department.

10.5.4.2 The owner or operator shall notify the Department immediately if either of the following occurs:

10.5.4.2.1 A fire that requires the services of a fire protection agency.

10.5.4.2.2 A spill or uncontrolled release that may endanger human health or the environment.

10.5.5 Prohibitions

10.5.5.1 Solid Waste generated outside of the State of Delaware shall not be combined, commingled or aggregated with solid waste that was generated in Delaware and that is required, pursuant to regulations promulgated by the Delaware Solid Waste Authority (DSWA), to be disposed of at a DSWA facility

10.5.5.2 No liquids, other than those used to disinfect, to suppress dust, or to absorb or cover odors from the solid waste, shall be added to the solid waste.

10.5.5.3 Open burning is prohibited on any transfer station site.

10.5.5.4 Scavenging is prohibited at any transfer station.

10.6 Cessation And Closure

10.6.1 General

When a transfer station ceases accepting solid waste, all of the waste on site shall be removed and the facility shall be closed in a manner that will eliminate the need for further maintenance at the site.

10.6.2 Required submittals; notification

10.6.2.1 An owner or operator of a new transfer station must submit a conceptual closure plan at the time of initial permit application. Any person desiring to close a transfer station shall, at least 90 days before the date on which the facility will stop accepting waste, submit the following to the Department:

10.6.2.1.1 Written notification of intent to close

10.6.2.1.2 Updated closure plan, and

10.6.2.1.3 Closure schedule.

10.6.2.2 At least 90 days prior to the date when waste will no longer be accepted at the facility, the owner or operator shall submit to the Department all of the items listed in Section 10.6.2.1. Closure activities shall not commence until the Department has:

10.6.2.2.1 certified in writing that the closure plan and schedule are complete in accordance with the requirements of these regulations;

10.6.2.2.2 given public notice regarding the closure activity and the opportunity for a public hearing as provided in 7 **Del.C.** Ch. 60;

10.6.2.2.3 approved in writing an updated closure plan and closure schedule

10.6.2.2.4 if a hearing has been requested, considered any comments received concerning the closure plan;

10.6.2.2.5 modified the permit to allow closure to take place.

For additional information on the public notice procedure see section 4.1.2 of these regulations.

10.6.2.3 A copy of the approved closure plan must be maintained at the facility or at some other location designated by the owner or operator until closure has been completed.

10.6.3 Closure plan contents

The closure plan for a transfer station must include, as a minimum, the following:

10.6.3.1 A description of the methods, procedures, and processes that will be used to close the transfer station, including provisions that will be made for the proper disposal of all waste that is on the site when operations cease.

10.6.3.2 An estimate of the cost of closing the facility. This estimate shall be updated yearly and submitted to the Department as a part of the annual report described in Section 10.5.4.1.6.

10.6.3.3 A plan for postclosure care of the facility if such care would be necessary to protect human health and the environment.

10.6.3.4 A description of the planned postclosure use of the property.

10.6.3.5 A copy of the approved closure plan must be maintained at the facility or at some other location designated by the owner or operator until closure has been completed.

10.6.4 Minimum closure requirements

10.6.4.1 Closure shall be carried out in accordance with the approved closure plan and the modified permit.

10.6.4.2 Closure must be complete within six months after the date on which the Department issued the approved closure plan and closure schedule.

10.6.4.3 When closure has been completed to the satisfaction of the Department, the Department will issue a letter indicating that closure has occurred in accordance with the closure plan.

10.6.4.4 After closure has been completed, the Department may require that the permittee conduct monitoring and/or maintenance activities at the site to prevent or detect and mitigate any adverse environmental or health impacts.

8 DE Reg. 354 (8/1/04)

11.0 Special Wastes Management

Part 1- Infectious Waste

11.1 General Provisions

11.1.1 All generators of infectious waste shall obtain an Infectious Waste Identification Number for each site or location that generates infectious waste. When more than one person (i.e., physicians with separate medical practices) is located in the same building, each individual business entity shall be considered a separate generator for purpose of these regulations. Registration shall be submitted on a form provided by the Department.

11.1.2 No person shall engage in the construction, operation, material alteration, or closure of a facility to be used in the treatment, storage, or disposal of infectious wastes, unless specifically exempted from the regulations within Section 2.3, without first having obtained the proper permits from the Department.

11.1.3 All infectious waste must be packaged in accordance with these regulations.

11.2 Siting

11.2.1 Infectious waste treatment facilities shall be located only in areas where the potential for degradation of the quality of air, land, and water is minimal.

11.2.2 Infectious waste treatment facilities shall be located adjacent to access roads capable of withstanding anticipated load limits.

11.2.3 No new infectious waste treatment facility shall be located in an area such that solid waste would at any time be handled:

11.2.3.1 Within the 100 year flood plain.

11.2.3.2 Within any state or federal wetland.

11.2.3.3 So as to be in conflict with any locally adopted land use plan or zoning requirement.

11.3 Definitions

In addition to the definitions in Section 3 of these regulations, the following definitions are specific to the management of infectious waste as used in this part.

"**6-log Reduction**" means a 6 decade reduction or a millionth (.000001) survival probability in a microbial population, i.e., a 99.9999% reduction.

"**ATCC**" means American Type Culture Collection.

"**Autoclave Tape**" means tape that demonstrates an evidentiary visible physical change when subjected to temperatures that will provide evidence of sterilization of materials during treatment in an autoclave or similar device.

"**CFU**" means colony-forming unit.

"**Challenge Loads**" means an infectious waste load that has been constructed by composition (i.e., organic content, moisture content, or other physical or chemical composition).

~~"**Class 4 Etiologic Agent**" means a pathogenic agent that is extremely hazardous to laboratory personnel or that may cause serious epidemic disease. Class 4 etiologic agents include the following viral agents:~~

~~Alastrim, Smallpox, Monkey pox, and Whitepox (when used for transmission or animal inoculation experiments).~~

~~Hemorrhagic fever agents (including Crimean hemorrhagic fever (Congo), Junin, and Machupo viruses, and others not yet defined).~~

~~Herpesvirus simiae (Monkey B virus)~~

~~Lassa virus~~

~~Marburg virus~~

~~Tick-borne encephalitis virus complex (including Absettarov, Hanzalova, HYPR, Kumlinge, Russian spring-summer encephalitis, Kyasanur forest disease, Omsk hemorrhagic fever and Central European encephalitis viruses)~~

~~Venezuelan equine encephalitis virus (epidemic strains, when used for transmission or animal inoculation experiments)~~

~~Yellow fever virus (wild, when used for transmission or animal inoculation experiments)~~

"**Class 4 Etiologic Agent**" means a pathogenic agent that is extremely hazardous to laboratory personnel or that may cause serious epidemic disease. Class 4 etiologic agents (now defined as Infectious Substance, Category A affecting humans of Infectious Substance, Category A affecting animals only) include the following viral agents and microbiological cultured materials:

*Variola major (Smallpox), Variola minor (Alastrim, Amass, Cottonpox, Milkpox, Monkey pox, Cuban Itch, and Whitepox) when used for transmission or animal inoculation experiments.

*Hemorrhagic fever agents (including Nairovirus, Crimean hemorrhagic fever (Congo), Dengue virus (cultures only), Flexal virus, Junin virus, Lassa virus, Marburg virus, Guanarito virus, Sabia virus, Hantavirus, Puumalavirus, Dobrava virus, Seoul virus, Rift Valley Fever virus, Ebola virus, Machupo viruses, Hendra virus, emerging hemorrhagic viruses such as Nipah virus, Hantavirus, and others not yet defined).

*Cultures of the following viruses: Herpesvirus simiae (Monkey B virus), Hepatitisu B virus, Human immunodeficiency virus (HIV), Highly pathogenic avian influenza virus, poliovirus, and Rabies virus.

*Tick-borne encephalitis virus complex (including Far Eastern encephalitis viruses such as Absettarov virus, Kyasanur forest disease, Louping ill virus, Negishi virus, Omsk hemorrhagic fever, Powassan virus, Russian spring-summer encephalitis, and Central European encephalitis viruses such as Hanzalova virus, HYPR virus, Kumlinge virus, Neudoerfl virus)

*Mosquito borne encephalitis virus cultures (Eastern equine encephalitis virus, Venezuelan equine encephalitis virus, Japanese encephalitis virus, and West Nile Virus (WNV), epidemic strains, when used for transmission or animal inoculation experiments)

*Yellow fever virus (wild, when used for transmission or animal inoculation experiments)

*Microbacteriological or toxin cultures of highly pathogenic or with high potential for transmission and/or easily disseminated organisms: Bacillus anthracis (Anthrax), Brucella abortus (Brucellosis), Brucella melitensis, Brucella suis, Burkholderia mallei - Pseudomonas mallei (Glanders), Burkholderia pseudomallei - Pseudomonas pseudomallei (Melioidosis), Chlamydia psittaci - avian strains, Clostridium botulinum (Botulism), Coccidioides immitis, Coxiella burnetii (Q-fever), Escherichia coli verotoxigenic, Francisella tularensis (Tularemia), Mycobacterium tuberculosis, Mycoplasma mycoides - Contagious bovine pleuropneumonia (animal only), Rickettsia prowazekii (Typhus fever), Rickettsia rickettsii, Shigella dysenteriae type 1, Yersinia pestis (plague) and others yet undefined.

*Viral cultures of highly pathogenic to animals or with high potential for transmission and/or easily disseminated organisms: Avian paramyxovirus Type 1 - Velogenic Newcastle disease virus, Classical swine fever virus, Foot and mouth disease virus, Goatpox virus, Lumpy skin disease virus, Peste des pestis

ruminants virus, Rinderpest virus, Sheep-pox virus, Swine vesicular disease virus, Vesicular stomatitis virus and others not yet defined.

"**Container**" means any portable enclosure in which a material is stored, managed or transported.

"**Contamination**" means the degradation of naturally occurring water, air or soil quality either directly or indirectly as a result of the transfer of diseased organisms, blood or other matter that may contain disease organisms from one material or object to another.

"**Etiologic Agents**": ~~see "INFECTIOUS SUBSTANCE"~~ means a viable microorganism, or its toxin, which causes or may cause disease in humans or animals, and includes any agent that causes or may cause severe, disabling, or fatal disease. The terms infectious substance and etiologic agent are synonymous.

"**Generator**" means any person whose act or process produces infectious waste as defined in these regulations, or whose act first causes an infectious waste to become subject to regulation. The universe of infectious waste generators includes, but is not limited to, hospitals, physicians' offices, dental offices, veterinary practices, funeral homes, research or medical laboratories, and nursing homes.

"**Incinerator**" means any enclosed device used to destroy waste material by using controlled flame combustion.

"**Indicator Microorganism Spores**" means those microorganism spores listed in Appendix A, Table B of Section 11, Part 1.

"**Infectious Substance**" (formerly called "ETIOLOGIC AGENTS") means a viable microorganism, or its toxin, which causes or may cause disease in humans or animals, and includes any agent that causes or may cause severe, disabling, or fatal disease. The terms *infectious substance* and *etiologic agent* are synonymous.

"**Infectious Waste**" means those solid wastes which may cause human disease and may reasonably be suspected of harboring human pathogenic organisms, or may pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed. Types of solid wastes designated as infectious include but are not necessarily limited to the following:

Biological wastes:

Biological liquid wastes means blood and blood products, excretions, exudates, secretions, suctionings and other body fluids including liquid wastes from renal dialysis.

Pathological wastes means all human tissues and anatomical remains, including human fetal remains, which emanate from surgery, obstetrical procedures, autopsy, and laboratory procedures.

Cultures and stocks of etiologic agents and associated biological wastes means, but is not limited to, specimen cultures, cultures and stocks of infectious substances, and wastes from production of biologicals and serums. Cultures are the result of a process by which pathogens are intentionally propagated.

Laboratory wastes means those wastes which have come in contact with pathogenic organisms or blood or body fluids. Such wastes include, but are not limited to, disposable materials, culture dishes, devices used to transfer, inoculate and mix cultures, paper and cloth which has come in contact with specimens or cultures which have not been sterilized or rendered noninfectious; or laboratory wastes, including cultures of infectious substances, which pose a substantial threat to health due to their volume and virulence.

Animal tissue, bedding and other waste from animals known or suspected to be infected with a pathogen which also causes human disease, provided that prevailing evidence indicates that such tissue, bedding or other waste may act as a vehicle of transmission to humans.

Human dialysis waste materials including blood lines and dialysate membranes.

Sharps means any discarded article that may cause puncture or cuts. Such wastes include, but are not limited to, needles, intravenous (IV) tubing with needles attached, scalpel blades, glassware and syringes that have been removed from their original sterile containers. For the purpose of these regulations, only sharps from human or animal health care facilities, human or animal research facilities or human or animal pharmaceutical manufacturing facilities shall be regulated as sharps.

Discarded Biologicals means serums and vaccines produced by pharmaceutical companies for human or veterinary use. These products may be discarded because of a bad manufacturing lot (i.e., offspecification material that does not pass quality control or that is recalled), outdating or removal of the product from the market or other reasons. Because of the possible presence of infectious substances in these products, the discarded material constitutes infectious waste.

Isolation Wastes means discarded materials contaminated with blood, excretions, exudates and/or secretions from humans who are isolated to protect others from highly communicable diseases (those diseases identified as caused by Class 4 etiologic agents).

Other infectious wastes means any residue or contaminated soil, water, or other debris resulting from the cleanup of a spill of any infectious waste.

"**Large Incinerator**" means an incinerator which has a capacity of greater than 1000 pounds per hour.

"Large Quantity Generator" means generators of infectious waste who generate 50 pounds or more of infectious waste per month.

"**Log Kill**" (L) means the difference between the logarithms of viable test microorganisms or indicator microorganism spores before and after treatment.

"Manifest" means a tracking document designed to record the movement of solid waste from the generator through its trip with a transporter to an approved off-site treatment or disposal facility.

"**Noninfectious**" means a state in which potentially harmful microorganisms are absent, free of pathogens.

"**Red Bag**" means an impermeable, 3-mil polyethylene bag or equivalent, red in color, for the collection, storage, and transport of infectious or regulated medical waste, which meets the following minimum performance requirements:

- Appearance: opaque, red. Each bag must carry the words "INFECTIOUS WASTE" or "REGULATED MEDICAL WASTE" or "BIOHAZARD" in one-inch (minimum) letters and carry the Biological Hazard Symbol.
- Dart Impact, F_{50}: 100 grams minimum.
- Elmendorf Tear: 380 grams minimum (any direction).
- Heavy metals: 100 ppm maximum combined total.

"**Regulated Medical Waste**" means "INFECTIOUS WASTE".

"**Shipment**" means that waste which is conveyed by a transporter between a generator and a designated facility or a subsequent transporter.

"**Small Incinerator**" means an incinerator which has a capacity equal to or less than 1000 pounds per hour.

"**Small Quantity Generator**" means generators of infectious waste who generate less than 50 pounds of infectious waste per month.

"**Storage Area**" means an area designated for the holding of waste for a temporary period, at the end of which time the waste is treated, disposed of, or stored elsewhere.

"**Test Microorganisms**" means those microorganisms listed in Appendix A, Table B of Section 11, Part 1.

11.4 Exemptions

11.4.1 The following solid wastes are not to be managed as infectious wastes:

11.4.1.1 Soiled diapers and feminine hygiene items produced by a person not known to have an infectious disease;

11.4.1.2 Wastes contaminated only with organisms which are not pathogenic to humans, and which are managed in accordance with all applicable regulations of the U.S. Department of Agriculture and the Delaware Department of Agriculture and Consumer Services and all other regulations governing this type of waste stream;

11.4.1.3 Food wastes which are pathogenic to humans only through direct ingestion;

11.4.1.4 Any infectious waste contaminated by, coincinerated with, or mixed with hazardous, radioactive or toxic waste becomes a hazardous, radioactive or toxic waste and shall then be managed under the appropriate regulations governing those waste types (7 **Del.C.** Ch. 63, 7 **Del.C.** Ch. 80 and any applicable federal regulations);

11.4.1.5 Waste consisting of human anatomical remains, including human fetal remains, managed by a licensed funeral director;

11.4.1.6 Bed linen, instruments, equipment and other reusable items are not wastes until they are discarded. This part and these regulations apply only to wastes. The regulations do not include the sterilization for disinfection of items that are reused for their original purpose. Therefore, the method of sterilization or disinfection of items prior to reuse is not limited. When reusable items are no longer serviceable and are discarded, they become wastes and subject to these regulations at that time and must be sterilized by steam, incinerated, or otherwise rendered noninfectious;

11.4.1.7 Waste generated by Delaware households;

11.4.1.8 Ash from incineration of infectious waste once the incineration process has been completed;

11.4.1.9 Residues from treatment and destruction processes of infectious waste once the waste has been both treated and destroyed;

11.4.1.10 Samples of infectious waste transported off-site by EPA or State-designated enforcement personnel for enforcement purposes are excepted from the requirements of this part during the enforcement proceeding; and

11.4.1.11 Biological liquid wastes which are directly discharged into a permitted wastewater treatment system.

11.5 Small Quantity Generator Requirements

~~11.5.1 Generators of infectious waste who produce less than 50 pounds per month are considered to be Small Quantity Generators.~~

11.5.~~2~~ 1 It is the responsibility of the Small Quantity Generator to arrange for proper waste disposal. A Small Quantity Generator shall contract the services of a permitted transporter of infectious waste, or render the waste non-infectious and non-recognizable using a process or equipment approved by the Department, prior to disposal.

11.5.~~3~~ 2 Requirements to submit manifest tracking documents shall apply to either the Small Quantity Generator or the transporter contracted by the generator for disposal of the infectious waste.

11.5.~~4~~ 3 Small Quantity Generators are exempt from the storage time requirements in Section 11.8.5.3 of this part as long as not more than 50 pounds of infectious waste are stored and so long as storage is protective of human health and the environment.

11.5.~~5~~ 4 Small Quantity Generators are exempt from the requirement to file an annual report to the Department. However, they are responsible for maintaining records of infectious waste disposal for a period of at least three years. Documentation shall include:

11.5.~~5~~.4.1 A description of how the waste was rendered non-infectious and non-recognizable, and

11.5.~~5~~.4.2 Copies of receipts or manifests for wastes managed by a permitted transporter of infectious waste.

11.6 Permit Requirements

11.6.1 All application requirements found in Section 4.1.2 through 4.1.11 of these regulations shall be performed unless specifically exempted within this part of the regulations.

11.6.2 Any person required to have a permit for activities that will occur in the management of infectious waste shall apply for a permit in accordance with Section 4.6. of these regulations and

the appropriate sections of the Delaware Regulations Governing the Control of Air Pollution. No activity shall occur prior to receipt of all permits required by the Department.

11.6.3 A new or revised operation plan for treatment, storage and/or disposal of infectious waste shall be submitted to the Department whenever there is an increase of more than 15 percent over a three calendar month average in the maximum quantity of infectious waste receiving treatment, storage or disposal per month by the facility or when changes are otherwise made in an existing operation plan.

11.7 Prohibitions

11.7.1 Infectious waste may not be disposed at a sanitary landfill unless the waste has been rendered noninfectious and nonrecognizable. (In the case of extracted teeth, sterilization followed by landfilling would be acceptable).

11.7.2 Compactors, grinders or similar devices may not be used by a generator to reduce the volume of infectious waste until after the waste has been rendered noninfectious, or unless the device is part of an approved treatment process which renders the waste noninfectious.

11.7.3 Infectious wastes shall not be sent to a recycling facility.

11.7.4 Waste consisting of human anatomical remains, including human fetal remains, may not be disposed of at sanitary landfills. The remains must be incinerated, cremated or interred in accordance with 24 **Del.C.** Ch. 31.

11.7.5 ~~Transchutes~~ Transfer chutes shall not be used to transfer infectious waste between locations where it is contained.

11.8 Packaging, Labeling, And Storage Requirements for all Generators

11.8.1 Responsibility for packaging and labeling.

The generator of infectious waste shall not submit for transport, storage, treatment or disposal any waste which is not packaged in accord with this part. As a bag or other container becomes full, it must be immediately sealed, packaged, labeled and managed as described in this part. Contractors or other agents may provide services to the generator, including packaging and labeling of infectious waste; however, no contract or other relationship shall relieve the generator of the responsibility for packaging and labeling the infectious waste as required by these regulations.

11.8.2 Packaging Requirements

All infectious waste shall be packaged as follows:

11.8.2.1 ~~Infectious wastes, other than sharps: A~~ll infectious waste, other than sharps, shall be packaged as follows: :

11.8.2.1.1 Waste shall be contained in two (one bag inside the other) RED BAGS. The bags shall be individually tied or sealed. As a bag or other container becomes full, it must be immediately sealed, packaged, labeled and managed as described in this part.

11.8.2.1.2 All bags containing infectious waste shall be red in color. Waste contained in red bags shall be considered infectious waste and managed as infectious waste.

11.8.2.1.3 Bags shall be sealed by lapping the gathered open end and binding with tape or closing device such that no liquid can leak.

11.8.2.1.4 In addition to the plastic bag containers described in this section, all infectious wastes must be enclosed in a double-walled corrugated fiberboard box or equivalent rigid container before it is transported beyond the site of generation.

Sharps shall be contained in leakproof, rigid, puncture resistant containers that are tightly lidded. As soon as the first sharp is placed in an empty container, the container shall be labeled with the word "SHARPS", and the Biological Hazard Symbol.

11.8.2.2 Sharps

11.8.3 Labeling requirements.

All infectious waste shall be labeled immediately after packaging. A label shall be securely attached to the outer layer of packaging and be clearly legible. The label may be a tag securely affixed to the

package. Indelible ink shall be used to complete the information on the labels, and the labels shall be at least three inches by five inches in size.

11.8.3.1 The following information shall be included on label one:

11.8.3.1.1 The name, address and business telephone number of the generator,

11.8.3.1.2 "Infectious" or "Regulated Medical Waste" in large print,

11.8.3.1.3 "Pathological Waste," if pathological waste is included in the contents, and

11.8.3.1.4 The name, address and business telephone number of the hauler or other persons to whose control the infectious waste will be transferred.

11.8.3.2 The following shall be included on label two: the Biological Hazard Symbol. The label shall be not less than three by five inches.

11.8.4 Infectious substances

All infectious substances that are transported must be packaged as described in the most current edition of 49 CFR 173.196, ~~October 1, 1996, Edition,~~ even when that transport is wholly within the boundaries of the State.

11.8.5 Storage of infectious waste

11.8.5.1 Infectious waste shall be ~~contained~~ stored in a manner that:

11.8.5.1.1 Affords protection from vectors, rain and wind,

11.8.5.1.2 Prevents the spread of infectious agents,

11.8.5.1.3 Does not provide a breeding place or food source for insects or rodents, and

11.8.5.1.4 Prevents the leakage of waste from the storage bag or container.

11.8.5.2 Infectious waste shall be placed in separate containers from other waste at the point of origin in the producing facility.

11.8.5.3 Infectious waste may not be stored at the waste producing facility for more than the following periods of time:

11.8.5.3.1 Up to fourteen days at room temperature (18 to 28 degrees Celsius, 65 to 82 degrees Fahrenheit) or up to 45 days in a refrigerator (2 to 7 degrees Celsius, 36 to 44 degrees Fahrenheit) for all types of infectious waste, so long as it does not produce conditions that are offensive or harmful to facility personnel or the public welfare.

11.8.5.3.2 Ninety days in a freezer (20 to 18 degrees Celsius, 4 to 1 degrees Fahrenheit) not used for food or patient related items.

11.8.5.3.3 ~~Exemption.~~ Sharps which are disposed in a container specifically designed for sharps and which is sealed so as to prevent leaks when it is full, are exempt from the time limit on storage.

11.8.5.4 A container used for the storage of infectious waste may not be reused unless one of the following applies:

11.8.5.4.1 It has been decontaminated utilizing a Department-approved decontamination procedure; or

11.8.5.4.2 The surface of the container has been protected from direct contact with infectious waste.

11.8.5.5 Reusable containers for infectious waste shall be thoroughly washed and decontaminated by a method approved by the Department of Health and Social Services or the Department each time they are emptied, unless the surfaces of the containers have been completely protected from contamination by disposable liners, bags or other devices removed with the waste. Approved methods of decontamination include, but are not limited to, agitation to remove visible soil combined with one of the following procedures:

11.8.5.5.1 All parts of the container shall come in contact with hot water of at least 82 degrees C (180 degrees F) for a minimum of 15 seconds.

11.8.5.5.2 All parts of the container shall come in contact with chemical sanitizer by rinsing with or immersion in one of the following for a minimum of 3 minutes:

11.8.5.5.2.1 Hypochlorite solution (500 ppm available chlorine),

11.8.5.5.2.2 Phenolic solution (500 ppm active agent),

11.8.5.5.2.3 Iodophor solution (100 ppm available iodine), ~~or~~

11.8.5.5.2.4 Quaternary ammonium solution (400 ppm active agent).

Or,

11.8.5.5.2.5 Vaporized hydrogen peroxide (30% active agent).

11.8.5.5.2.6 oclaving the container at a minimum of 121 degrees Celsius (250 degrees Fahrenheit) at 15 pounds per square inch of gauge pressure for 60 minutes or not less than 133 degrees Celsius (272 degrees Fahrenheit) at 27 pounds per square inch of gauge pressure for 30 minutes following the requirements in Section 10.4 of this part.

11.8.5.5.3 Reusable pails, drums, dumpsters or bins used for containment of infectious waste shall not be used for containment of waste to be disposed of as noninfectious waste or for other purposes except after being decontaminated by procedures as described in this paragraph.

11.8.5.6 Containment of infectious waste shall be in an area separate from other wastes. Areas used for the containment of infectious waste shall be secured so as to deny access to unauthorized persons and shall be marked with prominent warning signs and the biohazard symbol on, or adjacent to, the exterior of entry doors, gates or lids. Wording of warning signs shall be in English, "CAUTION INFECTIOUS WASTE STORAGE AREA UNAUTHORIZED PERSONS KEEP OUT". Warning signs shall be readily legible during daylight from a distance of at least 25 feet.

11.9 Management Of Spills

Spill containment and cleanup kit. All infectious waste management facilities are required to keep a small containment and cleanup kit within one hundred feet of any area where infectious wastes are managed. The facility shall maintain and implement a plan that provides the means of decontamination of any person having had bodily contact with infectious waste while transporting the waste to the treatment or disposal site or while handling or disposing of the waste at the site.

11.10 CLOSURE REQUIREMENT

When a facility that has been used for infectious waste management is to cease operations involving infectious wastes, it shall be thoroughly cleaned and disinfected. All waste shall be disposed of in accord with these regulations, and items of equipment shall be disinfected. (Note: Due to the variability in the type of infectious waste facilities, the Department will specify individual closure requirements in the permit issued to the facility.)

11.11 METHODS OF TREATMENT AND DISPOSAL

11.11.1 All treatment of infectious waste must utilize a method that will render the waste noninfectious.

11.11.2 All pathological waste must be incinerated, cremated or interred in accordance with 24 **Del.C.** Ch. 31. Other disposal methods are not acceptable for this type of waste. This requirement does not prohibit the disposal of certain specified wastes in a permitted wastewater treatment system (see Section 11.4.11 of this part).

11.12 RECORDKEEPING AND REPORTING REQUIREMENTS

All waste management or treatment facilities that manage infectious waste shall maintain, for a period of three years, the following records and assure that they are accurate and current:

11.12.1 A list containing the names of all individuals responsible for the management of infection control for the facility, their address, their phone numbers and the periods covering their assignment of this duty.

11.12.2 The date, persons involved and short description of events in each spill of infectious wastes.

11.12.3 A notebook or file containing the policies and procedures of the facilities for dealing with infectious wastes.

11.12.4 A log of all special training received by persons involved in the management of infectious waste.

11.12.5 A log of infectious waste generated at the site or received from offsite, including the amount, the date of generation, receipt dates, and the date of shipment.

11.12.6 Anyone that sterilizes or incinerates infectious waste shall maintain a log indicating the method of monitoring the waste as well as a verification that it has been rendered noninfectious.

11.12.7 The operator of a facility that incinerates infectious waste shall submit to the Department, at least annually during the life of the facility, a chemical analysis of composite samples of the ash residue. Parameters that are to be monitored will be specified in the permit.

11.12.8 Each generator of infectious waste shall submit an annual report on a form provided by the Department, summarizing the information from all manifests completed during the preceding calendar year. This report shall be submitted to the Department within ninety days after the end of the calendar year. The information contained in the report shall include, but not be limited to, the following:

11.12.8.1 A description of infectious waste generated and transported off site for treatment and disposal;

11.12.8.2 The total weight of infectious waste generated and transported off site for treatment and disposal;

11.12.8.3 The names and addresses of persons engaged by the generator to transport infectious waste off site;

11.12.8.4 The names and locations of the infectious waste management facilities with which the generator contracted for the treatment and/or disposal of infectious waste.

11.12.9 Each transporter of infectious waste shall submit an annual report on a form provided by the Department, summarizing the information from all manifests completed during the preceding calendar year. This report shall be submitted to the Department by April 1 of the year following the year covered by the report. The information contained in the report shall include, but not be limited to the following:

11.12.9.1 A description of infectious waste transported off site for treatment and disposal;

11.12.9.2 The total weight of infectious waste transported off site for treatment and disposal;

11.12.9.3 The names and addresses of generators contracting with the transporter to transport infectious waste off site.

11.12.9.4 The names and locations of the infectious waste management facilities where the transporter deposited the infectious waste for treatment and /or disposal.

11.13 Evidence Of Effectiveness Of Treatment

11.13.1 Treatment of infectious waste must be conducted in a manner which:

11.13.1.1 Eliminates the infectious potential of the waste. A treatment process eliminates the infectious potential of infectious waste if the owner or operator of a treatment unit demonstrates that an Initial Efficacy Test and Periodic Verification Test(s) have been completed successfully.

11.13.1.1.1 Successful completion of an Initial Efficacy Test is demonstrated by a 6-log reduction/kill of test microorganisms. For a thermal unit that maintains the integrity of container, a 6-log kill of indicator microorganism spores may be used as an alternative test.

11.13.1.1.2 Successful completion of a Periodic Verification Test is demonstrated by:

11.13.1.1.2.1 a 6-log kill of test microorganisms or indicator microorganism spores as provided in Subsection 11, Part 1, L.1.a; or

11.13.1.1.2.2 a minimum 3-log kill of indicator microorganism spores that have been correlated with a 6-log kill of test microorganism; or

11.13.1.1.2.3 an alternate method submitted to and approved by the Department.

11.13.1.2 Disposes treatment residues in accordance with these regulations.

11.13.1.3 Provides for quality assurance programs that must include, at a minimum, a written plan that:

11.13.1.3.1 Designates responsibility to personnel.

11.13.1.3.2 Describes parameters that must be monitored to insure effectiveness of the treatment process.

11.13.1.3.3 Identifies monitoring devices.

11.13.1.3.4 Ensures that monitoring devices are operating properly.

11.13.1.3.5 Establishes appropriate ranges for operating parameters.

11.13.1.3.6 Identifies person(s) who shall collect and organize data for inclusion in operating records.

11.13.1.3.7 Identifies person(s) who shall evaluate any discrepancies or problems.

11.13.1.3.8 Identifies person(s) who shall propose actions to correct problems identified, and

11.13.1.3.9 Identifies person(s) who shall assess actions taken and document improvement.

11.13.1.4 Provides for periodic biological testing, where appropriate, that demonstrates proper treatment of the waste.

11.13.1.5 Provides for assurances that clearly demonstrate that infectious waste has been properly treated; and

11.13.1.6 Is in compliance with all federal, state and local laws and regulations pertaining to environmental protection.

11.13.2 Initial Efficacy Test

11.13.2.1 The manufacturer, owner, or operator of a treatment unit shall conduct an Initial Efficacy Test, pursuant to Appendix A of this Section, for each model prior to its operation. If significant mechanical changes are made to a treatment unit, the Initial Efficacy Test must be repeated. The treatment units are considered to be the same model if they:

11.13.2.1.1 Are manufactured by same company,

11.13.2.1.2 Have the same company name, and

11.13.2.1.3 Have no significant mechanical changes.

11.13.2.2 The Initial Efficacy Test shall be conducted using option 1, 2 or 3 as described in Appendix A of this Section, using the challenge loads listed in Table C of Appendix A, or by an equivalent procedure that meets the requirements of the Initial Efficacy Test and has been approved by the Department. If any of the challenge loads fails the Initial Efficacy Test, the operating conditions must be revised and the Initial Efficacy Test must be repeated for all challenge loads. The Initial Efficacy Test must also meet the requirements of this Section.

11.13.2.3 Composition of challenge loads

11.13.2.3.1 For treatment units designed to treat all types of infectious wastes, all three types of challenge loads must be used in conducting the Initial Efficacy Test. The three (3) types of challenge loads represent infectious waste with a high moisture content, low moisture content and high organic content. The quantity of each challenge load must equal 100% of the maximum capacity of the treatment unit.

Each challenge load must consist of a minimum 5% (by weight) of each of the following categories: blood/broth cultures, fibers, metals, sharps, plastics, pathological waste, glass, non-woven fibers, and bottles of liquids. Table C of Appendix A contains the moisture and organic content requirements that must be met in each type of challenge load.

11.13.2.3.2 For treatment units designed to treat select categories of infectious waste (e.g., sharps treatment unit), modification in the composition of the challenge load(s) may be used if approved by the Department in writing.

11.13.2.4 The Initial Efficacy Test must be conducted under the same operating conditions under which the treatment unit operates on a day-to-day basis. The feed rate for the treatment unit must remain constant throughout the Initial Efficacy Test. This feed rate must never be exceeded during the operation of the treatment unit.

11.13.2.5 The Initial Efficacy Test must be performed so that:

11.13.2.5.1 Each container of the test microorganisms and/or indicator microorganism spores is placed in the load to simulate the worst case scenario (i. e., that part of load that is the most difficult to treat). For example, the worst case scenario for an autoclave would be to place the container(s) of test microorganisms and/or indicator microorganism spores within a sharps container that must in turn be deposited in a plastic biohazard bag that is then located centrally within the challenge loads.

11.13.2.5.2 Test microorganisms and/or indicator microorganisms must be cultured and enumerated in accordance with instructions provided by the supplier of micro-organisms and Standard Methods for the Examination of Water and Wastewater.

11.13.2.6 A Document of Initial Efficacy Test must be retained in the treatment facility, and made available during normal business hours for inspection and photocopying by an authorized representative of the Department. The Document of Initial Efficacy Test must include at the minimum:

11.13.2.6.1 A detailed description of the test procedures used, including all test data generated, with descriptions of data handling, and interpretation of final test results.

11.13.2.6.2 A detailed description and verification of the operating parameters (e.g., temperature, pressure, retention times, chemical concentrations, irradiation dose, and feed rates).

11.13.2.6.3 A description of quality assurance/quality control procedures and practices for the culture, storage and preparation of test and/or indicator microorganisms (including, but not limited to, organism history, source, stock culture maintenance, and enumeration procedures). The purity of the test microorganisms and/or indicator microorganism spores must be certified by a commercial or clinical laboratory.

11.13.3 Periodic Verification Test(s)

11.13.3.1 The effectiveness of the treatment unit shall be verified by conducting Periodic Verification Test(s) which must be carried out in accordance with this Subsection.

11.13.3.2 Periodic Verification Test(s) must be conducted quarterly or more frequently if required by the permit or recommended by the manufacturer.

11.13.3.3 The manufacturer, owner, or operator of a treatment unit must perform Periodic Verification Test(s) that satisfy at least one (1) of the following:

11.13.3.3.1 Passing the Initial Efficacy Test by using option 1, 2 or 3 of appendix A of this part (whichever is applicable). The three challenge loads described in Appendix A, Table C, do not need to be used. The test microorganism or indicator micro-organisms must be placed in a representative load in accordance with Subsection 11, Part 1, 11.13.2.5.1. For example, an autoclave may use option 3 (e.g., demonstrate at a minimum the destruction of one million *Bacillus stearothermophilus* spores) to meet the Periodic Verification Test requirement. In the case of an incinerator a stainless steel pipe with threaded ends and removable caps lined with ceramic insulation may be used to contain a glass culture vial with a *Bacillus subtilis* spores strip. The pipe with the spore strips may be placed in the load of infectious waste for the Periodic Verification Test. After the treatment, the pipe with the spore strips may be recovered and the spores may be cultured to assess whether, at a minimum, one million spores have been destroyed to meet the Periodic Verification Test(s) requirement.

11.13.3.3.2 Correlating the log kill (L) of the test microorganisms in the Initial Efficacy Test to an equivalent log kill (T) of indicator microorganism spores in accordance with Appendix B. The equivalent log kill (T) of indicator microorganism spores must be used for all subsequent Periodic Verification Tests.

The correlation must be done with three challenge loads identified in Table C of Appendix A (See Subsection 11, Part 1, 11.13.3.4.3 below for further requirements).

11.13.3.3.3 Submitting to and obtaining written approval by the Department for a procedure that is equivalent to Subsection 11, Part 1, 11.13.3.3.1 and 11.13.3.3.2. Examples of alternatives include, but are not limited to, use of another indicator microorganism, or measurement of disinfectant concentrations in the treated residue. For incinerators only, an example of an alternative is visually inspecting the ash from each load of treated infectious waste to ensure that all infectious waste within the load is completely combusted. The approval of an alternative by the Department may require more frequent testing and/or monitoring of the treatment unit.

11.13.3.4 If correlation is being used for the Periodic Verification Test, (i.e., the correlation of log kill (L) of the test microorganisms with equivalent log kill (T) of the indicator microorganism spores) the following procedures apply:

11.13.3.4.1 At a minimum, an initial population of one million indicator microorganism spores per gram of waste solids in each challenge load must be used.

11.13.3.4.2 The fraction of surviving indicator microorganism spores that correlates to a log kill (L) of six (6) for each test microorganism must be used for future Periodic Verification Test(s). [For example, if a log kill (L) of four (4) for the indicator microorganism spores per gram of waste solids is achieved during this demonstration, then a population of 10,000 of indicator microorganism spores must be used in future Periodic Verification Test(s).] Challenge loads described in Appendix A, Table C, do not need to be used. The test microorganism or indicator microorganism spores must be placed in a representative load in accordance with Subsection 11, Part 1, 11.13.2.5.1.

11.13.3.4.3 An equivalent log kill (T) of at least three (3) for the indicator microorganism spores must be achieved to ensure that all test microorganisms are destroyed.

11.13.3.4.4 Test microorganisms and/or indicator microorganism spores must be cultured and enumerated in accordance with instructions provided by the supplier of the microorganisms and Standard Methods for the Examination of Water and Wastewater.

11.13.3.4.5 The Periodic Verification Test and Initial Efficacy Test may be run concurrently to verify the correlation.

11.13.3.5 If a load of infectious waste fails a Periodic Verification Test, the Periodic Verification Test(s) must be repeated. The operator shall implement the quality assurance program and contact the manufacturer. If applicable, identify and correct the exact problem(s) until the unit can eliminate the infectious potential of the infectious waste. If the operating parameters are altered another Initial Efficacy Test must be performed to demonstrate the effectiveness of the unit and, if applicable, another Periodic Verification Test correlation, pursuant to Subsection 11, Part 1, 11.13.3.3 must be repeated. Loads of infectious waste that were processed prior to receiving the results showing a failure of Periodic Verification Test are considered treated. A second Periodic Verification Test must be run immediately after the first Periodic Verification Test indicates failure. The second Periodic Verification Test is to determine whether or not the treatment unit is eliminating the infectious potential of the waste. After the second Periodic Verification Test shows a failure of the treatment unit, any waste processed after the first detection of failure is considered infectious waste and must be managed accordingly.

11.13.3.6 Results of the Periodic Verification Test(s) must be received, verified and made available for inspection by the Department within 2 weeks of when the test was conducted. When a Periodic Verification Test is used to confirm the failure of a treatment unit, the results of the Periodic Verification Test(s) must be made available in accordance with the requirements of subsection h below.

11.13.3.7 A Document of Correlating Periodic Verification Demonstration must be prepared by and retained for at least three (3) years at the treatment facility during normal business hours for inspection by the Department. The Document of Periodic Verification Demonstration must include, at a minimum:

11.13.3.7.1 A detailed description of the test procedures used and the correlation between the log kill (L) of the test microorganisms and the equivalent log kill (T) of the indicator

microorganism spores. An evaluation of the test results must include all test data generated, a description of data handling, and a presentation and interpretation of test results.

11.13.3.7.2 A detailed description and verification of the operating parameters (e. g., temperature, pressure, retention times, chemical concentrations, irradiation dose, and feed rates).

11.13.3.7.3 A description of quality assurance/quality control procedures and practices for the culture, storage and preparation of test and/or indicator microorganisms (including, but not limited to, organism history, source, stock culture maintenance, and enumeration procedures). The purity of the test microorganisms and/or indicator microorganism spores must be certified by a commercial or clinical laboratory.

11.13.3.8 Records of Periodic Verification Test(s) must be prepared and retained for at least three (3) years at the treatment facility, and made available at the treatment facility during normal business hours for inspection by the Department. These records will include, at the minimum:

11.13.3.8.1 The date(s) on which the Periodic Verification Test(s) were performed.

11.13.3.8.2 Operating parameters (e.g., temperature, pressure, retention times, chemical concentrations, irradiation dose and feed rates).

11.13.3.8.3 Test protocols.

11.13.3.8.4 Evaluation of test results.

11.13.3.8.5 The name(s), date, signature(s) and title(s) of Person(s) conducting the Periodic Verification Test(s).

11.13.3.9 Periodic Verification Test(s) must be conducted under the same operating conditions under which the treatment unit operates on day-to-day basis. The feed rate for the treatment unit is the maximum feed rate at which the unit operates on day-to-day basis. The feed rate must remain constant throughout the Periodic Verification Test(s). This feed rate must never be exceeded during the operation of the treatment unit.

11.14 Transport~~ation~~er Requirements

All transporters of infectious waste must be in compliance with all applicable federal and state regulations and codes. No person shall transport solid waste, including infectious waste, without first having obtained a permit from the Department, unless specifically exempted by these Regulations. Refer to Section 7 of these Regulations, TRANSPORTERS.

11.14.1 Temperature Control and Storage Period

The transporter must deliver infectious waste to a disposal facility within 15 days from collection from the generation facility.

11.14.1.1 Infectious waste shall be transported in a manner that:

11.14.1.1.1 Affords protection from vectors, rain and wind,

11.14.1.1.2 Prevents the spread of infectious agents,

11.14.1.1.3 Does not provide a breeding place or food source for vectors, and

11.14.1.1.4 Prevents leakage of waste from the storage bags or other containers.

11.14.1.2 Infectious waste shall be transported to offsite processing or disposal facilities in a manner consistent with these regulations.

11.14.1.3 Motor Vehicles for transporting infectious waste shall be noncompaction type vehicles.

Surfaces of vehicles that have been in direct physical contact with infectious waste, because of a leak in a container or because of some other reason, shall be decontaminated as soon as possible after unloading. Surfaces of vehicles that have not been in direct physical contact with infectious waste shall be decontaminated weekly.

11.14.2 Packaging, Labeling and Placards

11.14.2.1 No person shall transport or receive for transport any infectious waste that is not packaged and labeled in accord with these regulations.

11.14.2.2 Any vehicle holding infectious waste in transport shall have a warning sign in bold letters, a minimum of 4 inches in height and in a color that contrasts the color of the vehicle, that indicates the cargo is infectious waste.

11.14.2.3 Vehicle access door labeling:

11.14.2.3.1 Transporters in interstate commerce must comply with one of the following labeling options:

11.14.2.3.1.1 The access doors to the cargo area of the vehicle must meet the requirement for intrastate transporters of infectious waste, as described in Section 11.14.2.3.2 of this part; or

11.14.2.3.1.2 The access doors to the cargo area of the vehicle must comply with the labeling requirements of the state of origin of the infectious waste or the labeling requirements of the state of destination of the infectious waste. Examples of the labeling must be submitted to and approved by the Department prior to transport of the infectious waste through Delaware.

11.14.2.3.2 Transporters in intrastate commerce: The access doors to the cargo area of the vehicle must bear a sign with the words INFECTIOUS WASTE in bold, four inch letters. Such sign must be easily readable from a distance of 25 feet. The access doors to the cargo area of the vehicle must additionally bear a sign with the universal biological hazard symbol with minimum symbol dimension of six inches, and with the word BIOHAZARD in bold letters at least one inch in height. The symbol must be easily recognizable from a distance of 25 feet.

11.14.3 Management of Spills of Infectious Waste

11.14.3.1 ~~Spill containment and cleanup kit.~~

All infectious waste transportation vehicles are required to keep within the vehicle the containment and cleanup kit specified in the permit. The vehicle shall be equipped with a written plan, approved by the Department, that provides the means of decontamination of a release of infectious waste while transporting the waste to the treatment or disposal site or while handling the waste at the site. The driver shall be trained by the employer to implement this plan.

11.14.3.2 As required in 7 **Del.C.** Ch. 60, the Department is to be notified immediately of all spills.

11.14.4 Loading and Unloading

Persons manually loading or unloading containers of infectious waste on or from transport vehicles shall wear protective gloves or clothing, as appropriate.

11.15 Sterilization

~~11.15.1~~ ~~Application~~

~~The requirements of this part apply to all persons that steam sterilize infectious waste.~~

11.15.~~2~~1 ~~Performance Standards~~

All persons that steam sterilize infectious waste shall maintain the following level of operational performance at all times:

11.15.~~2~~ 1.1 ~~Operational temperature and detention.~~

Whenever infectious wastes are treated in a steam sterilizer, all the waste shall be subjected to a temperature of not less than 250 degrees Fahrenheit for 90 minutes at 15 pounds per square inch of gauge pressure or not less than 121 degrees Celsius (250 degrees Fahrenheit) for 90 minutes at 15 pounds per square inch of gauge pressure or not less than 133 degrees Celsius (272 degrees Fahrenheit) 272 degrees Fahrenheit for 45 minutes at 27 pounds per square inch of gauge pressure. Other combinations of operational temperatures, pressure and time may be used if the installed equipment has been proved to achieve a reliable and complete kill of all microorganisms in waste at capacity. Complete and thorough testing shall be fully documented, including tests of the capacity of kill B. stearothermophilus.

~~11.15.2.2~~ ~~Operational controls and records.~~

11.15.~~2.2.1.~~1.2 Each package of waste to be steam sterilized shall have autoclave tape attached that will indicate if the sterilization temperature has been reached and waste will not be considered satisfactorily sterilized if the indicator fails to indicate that the temperature was reached during the process.

11.15.~~2.2.1.~~1.3 Steam sterilization units shall be evaluated for effectiveness with spores of B. stearothermophilus no less than once every 40 hours of operation or once per month, whichever is more often.

11.15.~~2.2.1.~~1.4 A log shall be kept at each sterilization unit that is complete for the proceeding three-year period. The log shall record the date, time, temperature, pressure, type of waste, type of container(s), closure on container(s), pattern of loading, water content, operator of each usage; the type and approximate amount of waste treated; the post-sterilization reading of the temperature sensitive tape; the dates and results of calibration; and the results of effectiveness testing with B. stearothermophilus.

11.15.~~2.2.1.~~1.5 Infectious waste shall not be compacted or subjected to violent mechanical stress before sterilization; however, after it is fully sterilized it may be compacted in a closed container.

11.15.~~3~~2 Compliance with Other Parts of these Regulations

~~In general, s~~Sterilizer facilities shall comply with all other parts of these regulations. The site of the sterilizer facility is a storage facility and must comply with those regulations. Spills or the opening in an emergency of any infectious waste package, shall comply with the regulations pertaining to spills.

11.15.4 OffSite Operations

Any person who operates offsite facilities for the sterilization of infectious waste shall operate those facilities in compliance with a plan approved by the Department. The plan shall address in detail practices, procedures and precautions in the unloading, preparation and sterilizer loading of the waste.

11.16 Manifest Requirements

11.16.1 A generator of infectious waste shall complete a manifest before shipping, or causing the shipment of, infectious waste off site. The manifest shall consist of a multicopy form provided by the Department or equivalent approved in writing by the Department.

11.16.2 No person shall accept custody of infectious waste unless the waste is packaged in accordance with the requirements of Section 11.8 of this part and is accompanied by a properly completed manifest which complies with the requirements of Section 11.16 of this part. Upon accepting custody of infectious waste, the transporter shall sign and date the manifest. After the manifest has been signed and dated by both the generator and the transporter, the generator shall retain one copy of the form. The transporter shall keep the remaining four copies until the waste is delivered to the infectious waste facility.

11.16.3 The operator of an infectious waste management facility may accept custody of infectious waste only if the waste is accompanied by a manifest which complies with the requirements of Section 11.16 of this part. Upon accepting the waste, the operator of the infectious waste management facility shall sign and date the manifest, give one copy to the transporter, and keep the remaining three copies. The operator shall:

11.16.3.1 Sign and date the remaining three copies of the manifest certifying that the waste will be treated and/or handled in accordance with all applicable regulations and facility permits.

When multiple consignments are received and disposed as a batch, a cover letter with a list of manifest numbers, date received, date rendered non-infectious, certification of disposal, signature and date may be substituted for individual certification on each manifest. The cover letter must be mailed to the State with manifests attached. The generator copy of these manifests may use a date and signature stamp in lieu of original signature.

11.16.3.2 Send one copy of the manifest to the generator no later than fifteen calendar days from the date on which the waste was treated or disposed of;

11.16.3.3 Send one copy of the manifest to the Department; and

11.16.3.4 Keep the remaining copy.

11.16.4 Any generator of infectious waste who does not receive a copy of the manifest signed by the operator of the infectious waste management facility within fifteen calendar days of the date of shipment shall immediately contact the transporter and the facility to determine the status of the shipment. If, within

twenty days of the date of shipment, the generator still has not received a signed copy of the manifest from the infectious waste management facility, the generator shall notify the Department in writing. The notification shall include a legible copy of the manifest as signed by the generator and transporter, a description of the efforts made by the generator to locate the shipment, and the results of those efforts.

11.16.5 Copies of the manifest shall be retained by all parties for at least three years.

11.17 Large Quantity Generator Requirements

11.17.1 It is the responsibility of the Large Quantity Generator to arrange for proper waste disposal. A Large Quantity Generator shall contract the services of a permitted transporter of infectious waste, or render the waste non-infectious and non-recognizable using a process or equipment approved by the Department, prior to disposal.

11.17.2 Large Quantity Generators are responsible for the storage requirements in Section 11.8.5 of this part.

11.17.3 Each generator of infectious waste shall submit an annual report on a form provided by the Department, summarizing the information from all manifests completed during the preceding calendar year. This report shall be submitted to the Department within ninety days after the end of the calendar year. The information contained in the report shall include, but not be limited to, the following:

11.17.3.1 A description of infectious waste generated and transported off site for treatment and disposal;

11.17.3.2 The total weight of infectious waste generated and transported off site for treatment and disposal;

11.17.3.3 The names and addresses of persons engaged by the generator to transport infectious waste off site;

11.17.3.4 The names and locations of the infectious waste management facilities with which the generator contracted for the treatment and/or disposal of infectious waste.

11.17.4 Large Quantity Generators are responsible for maintaining records of infectious waste disposal for a period of three years. Documentation shall include: A description of how the waste was rendered non-infectious and non-recognizable, and copies of receipts or manifests for wastes managed by a permitted transporter of infectious waste.

Section 11, Part 1
Appendix A
Initial Efficiency Test Procedures

The manufacturer, owner, or operator of an infectious waste treatment unit must carry out an Initial Efficacy Test by using Option 1, 2, or, 3 below, as appropriate for the type of unit, or other procedures, if approved in advance by the Department.

1. Option 1

This option consists of two (2) Phases:

a. Phase 1: Determining the dilution of each test microorganism from the treatment unit for each challenge load (Types A through C) identified in Table C of this Appendix.

(1.) Prepare and sterilize by autoclaving two (2) challenge loads of Type A as identified in Table C. Reserve one challenge load for Phase 2.

(2.) Process each test microorganism in separate runs through the treatment unit. Prior to each run, determine the number of viable test microorganisms in each container, in accordance with applicable manufacturer's recommendations and Standard Methods for the Examination of Water and Wastewater.

(3.) Process each challenge load within thirty (30) minutes after introducing the container of test microorganism into the treatment unit. The container of test microorganisms and the challenge loads must be processed together without the physical and/or chemical agents designed to kill the test

microorganisms. For example, in treatment units that use chemical disinfectant(s), an equal volume of liquid (e.g., sterile saline solution (0.9%, volume/volume), phosphate buffer solution, or tap water) must be substituted in place of the chemical disinfectant(s).

(4.) Obtain at least five (5) representative grab samples from the processed residue of each challenge load in accordance with Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846). The number of viable test microorganisms in each grab sample must be determined in accordance with applicable manufacturer's recommendations and Standard Methods for the Examination of Water and Wastewater.

(5.) Calculate the effect of dilution for the treatment unit as follows:

$SA = \text{Log } N_0A - \text{LogN1A: where Log N1A} \geq 6$

where: SA is the log of the number of viable test microorganisms (CFU/gram of waste solids) that were not recovered after processing challenge load Type A.

N_0A is the number of viable test microorganisms (CFU/gram of waste solids) introduced into the treatment unit for challenge load Type A.

N1A is the number of viable test microorganisms (CFU/gram of waste solids) remaining in the processed residue for challenge load Type A.

If Log N1A is less than 6, then the number of viable test microorganisms introduced into the treatment unit must be increased and steps (1) through (6) in Phase 1 must be repeated until LogN1A is ≥ 6. N_0A is the inoculum size for challenge load Type A in Phase 2 below.

(6.) Repeat steps (1) through (5) in Phase 1 for challenge loads of infectious waste for Type B and C identified in Table C of this Appendix to determine the effect of dilution (SB and SC respectively).

b. Phase 2: Determining the log kill of each test microorganism in each challenge load (Type A through C) identified in Table C of this Appendix.

(1.) Using the inoculum size (N_0A) determined in Phase 1 above, repeat Phase 1 steps (1) through (5) under the same operating parameters, except that the physical and/or chemical agents designed to kill the test microorganisms must be used.

(2.) Calculate the effectiveness of the treatment unit by subtracting the log of viable cells after the treatment from the log of the viable cells introduced into the treatment unit as inoculum, as follows:

$LA = \text{Log } N_0A - SA - \text{Log N2A} \geq 6$

where: LA is the log kill of the test microorganisms (CFU/gram of waste solids) after treatment in the challenge load Type A.

N_0A is the number of viable test microorganisms (CFU/gram of waste solids) introduced into the treatment unit as the inoculum for challenge load Type A as determined in Phase 1 above.

SA is the log of the number of viable test microorganisms (CFU/gram of waste solids) that were not recovered after processing challenge load Type A in Phase 1 above.

N2A is the log of the number of viable test microorganisms (CFU/gram of waste solids) remaining in the treated residue for challenge load Type A.

(3.) Repeat steps (1) and (2) in Phase 2 for challenge loads Types B and C identified in Table C of this Appendix to determine the effectiveness of the treatment unit (LB and LC respectively).

2. Option 2:

a. Place one microbiological indicator assay containing one of the test microorganisms at numbers greater than one million in a sealed container that remains intact during the treatment. The inside diameter of the container must be no larger than required to contain the assay vial(s). The vial(s) must contain the test microorganisms.

b. Place the container of test microorganisms within a Type A challenge load as identified in Table C of this Appendix.

c. Process the load.

d. Calculate the effectiveness of the treatment unit by subtracting the log of viable cells after treatment from log of viable cells introduced into the treatment unit as inoculum, as follows:

$LA = \text{Log } N_0 - \text{Log } N2A^3 \geqq 6$

where: LA is the log kill of the test microorganisms (CFU/gram of waste solids) after treatment in the challenge load Type A.

N_0 is the number of viable test microorganisms (CFU/gram of waste solids) introduced into the treatment unit as the inoculum.

N2A is the log of the number of viable test microorganisms (CFU/gram of waste solids) remaining in the treated residue for challenge load Type A.

e. Repeat steps a through d in this option for challenge loads Types B and C identified in Table C of this Appendix to determine the effectiveness of the treatment unit (LB and LC respectively).

3. Option 3:

a. Place one microbiological indicator assay containing at least one million spores of one of the indicator microorganisms listed in Table B of this Appendix, in a sealed container that remains intact during treatment. The inside diameter of the container must be no larger than required to contain the assay vial(s).

b. Place the container of the indicator microorganisms within a Type A challenge load as identified in Table C of this Appendix.

c. Process the load.

d. Calculate the effectiveness of the treatment unit by subtracting the log of viable cells after treatment from log of viable cells introduced into the treatment unit as inoculum, as follows:

$LA = \text{Log } N_0 - \text{Log } N2A^3 \geqq 6$

where: LA is the log kill of the test microorganisms (CFU/gram of waste solids) after treatment in challenge load Type A.

N_0 is the number of viable indicator microorganisms (CFU/gram of waste solids) introduced into the treatment unit as the inoculum.

N2A is the log of the number of viable test microorganisms (CFU/gram of waste solids) remaining in the treated residue for challenge load Type A.

e. Repeat steps a through d in this option for challenge loads Types B and C identified in Table C of this Appendix to determine the effectiveness of the treatment unit (LB and LC, respectively).

APPENDIX A: TABLES

TABLE A: Test Microorganisms

a. Staphylococcus aureus (ATCC 6538)
b. Pseudomonas aeruginosa (ATCC 15442)
c. Candida albicans (ATCC 18804)
d. Trichophyton mentagrophytes (ATCC 9533)
e. MS-2 Bacteriophage (ATCC 15597-B1)
f. Mycobacterium smegmatis (ATCC 14468)

TABLE B: Indicator Microorganisms

a. Bacillus subtilis (ATCC 19659)
b. Bacillus stearothermophilus (ATCC 7953)
c. Bacillus pumilus (ATCC 27142)

TABLE C: Challenge Loads

This Table identifies the three types of challenge loads of infectious waste that must be used as a part of Initial Efficacy Test and Periodic Verification Test(s).

COMPOSITION OF CHALLENGE LOADS % (w/w)			
Type	A	B	C
Moisture	£≧5	³≧50	-----
Organic	----	----	³≧70

Sec. 11, Part 1,
APPENDIX B

Correlating Periodic Verification Procedures

1. Use a certified microbiological indicator assay containing the test microorganisms and indicator microorganism spores.

2. Place the test microorganisms and indicator microorganism spores into sealed containers that remain intact during treatment.

3. Place a container of the test microorganisms and indicator microorganism spores in each challenge load (as described in Appendix A, Table C) to simulate the worst case scenario (i.e., that part of load that is the most difficult to treat). For example, the worst case scenario for an autoclave would be to place the container of test microorganisms and indicator microorganism spores within a sharp container that must in turn be deposited in a plastic biohazard bag that is then located centrally within the treatment unit.

4. Determine the effectiveness of the treatment unit by calculating the log kill (L) of the test microorganisms in accordance with Option 2 of Appendix A. The equivalent kill (T) of the indicator microorganism spores is calculated by subtracting the log of viable cells after treatment from the log of viable cells introduced into the treatment unit as inoculum as follows:

$TA = \text{Log } N_0 - \text{Log } N2A^3 \geq 3$

where: TA is the equivalent log kill of the viable indicator microorganisms (CFU/gram of waste solids) after treatment in the challenge load Type A.

N_0 is the number of viable indicator microorganism spores (CFU/gram of waste solids) introduced into the treatment unit as the inoculum (³≧6).

N2A is the number of viable indicator microorganisms (CFU/gram of waste solids) remaining after treatment in challenge load Type A.

5. Repeat steps 1 through 4 for challenge loads Types B and C identified in Table C of Appendix A to determine the correlation between the log kill of the test microorganisms and equivalent kill of the indicator microorganism spores (LB and LC, respectively).

11.0 Special Wastes Management

Part 2 - Municipal Solid Waste Ash

11.1 General Provisions

11.1.1 Municipal solid waste (MSW) ash is considered a hazardous waste, as defined in the Delaware Regulations Governing Hazardous Waste (DRGHW), unless the generator of the ash can demonstrate that the ash is not a hazardous waste. In order to make such a demonstration, the owner or operator of the generating facility must show that the ash does not exhibit the Toxicity Characteristic (TC) as described in DRGHW, §261.24. Any person desiring to make such a demonstration shall develop and implement a sampling

and analysis plan designed to provide reliable information on the chemical properties of the ash. The plan shall be submitted to the Solid and Hazardous Waste Management Branch as a part of the facility's application for a Solid Waste Facility permit. The facility will not be permitted to operate until the Department has approved the plan.

11.1.2 The sampling and analysis plan shall include the following:

11.1.2.1 A detailed description of the sampling protocol (how and where samples will be collected, how many samples will be collected, how samples will be composited, how samples will be handled and stored, etc.)

11.1.2.2 A description of the analyses that will be performed on the samples.

11.1.2.3 A description of the procedures that will be used to ensure the quality of the sampling and analysis data.

11.1.3 The owner or operator of a facility in Delaware desiring to process MSW ash generated in another state must first receive written approval from the Department to accept MSW ash from that generator. To receive such an approval a person must:

11.1.3.1 Demonstrate, to the Department's satisfaction, that the ash does not exceed the levels specified in the TC; and

11.1.3.2 Develop, and receive Department approval of, a plan for sampling and analysis of the incoming MSW ash.

11.2 Sampling

11.2.1 This subsection describes the minimum amount of sampling that the Department deems appropriate for MSW ash generated by facilities that meet the following two assumptions:

11.2.1.1 The waste feed prior to incineration is not segregated by type of generator, and

11.2.1.2 The ash generated is not separated by size during storage or disposal.

If either of these two assumptions is not valid, then a facility-specific sampling and analysis program shall be designed by knowledgeable personnel and shall be implemented after receiving Department approval.

11.2.2 The sampling strategy shall be sufficient to enable the facility owner or operator to assess the properties of the ash and to ascertain its variability over time.

11.2.3 The sampling strategy shall provide for reassessment of the ash at least quarterly, in accordance with a Department-approved schedule. In determining how often to recharacterize the ash, the generator shall consider all facility-specific and external factors that could cause the ash properties to vary. These factors include:

11.2.3.1 Changes in the composition of the waste (e.g., new types of industries moving into the area, institution of recycling programs in the collection area, seasonal changes affecting population or waste composition).

11.2.3.2 Changes in plant design (e.g., addition of dry scrubber, addition of quench tank).

11.2.3.3 Significant changes in plant operating conditions (e.g., increase in combustion time or temperature, change in lime utilization rate).

11.2.4 The sampling strategy shall include the following steps:

11.2.4.1 Determine the most convenient location for sampling. In situations where the sampling can be conducted either from transport vehicles or from the waste conveyance device, the Department recommends sampling from the transport vehicle (i.e. dump truck, barge).

11.2.4.2 Construct a sampling device (trough, bucket, shovel, thief, etc.) to be used to gather a grab sample of the entire depth of the hopper, pile, or truck load, or the entire width of the belt conveyor, drag chain flight, or vibrating conveyor. ASTM standards for sampling unconsolidated waste materials from trucks may be used for guidance if the ash is to be sampled from trucks.

11.2.4.3 If a conveyor is to be the sample location, collect the entire width of the conveyor at a fixed point each hour for eight (8) hours. If trucks are to be sampled, randomly select eight trucks to

sample during the eight-hour period. In certain situations, where fewer than eight truckloads are generated, a different schedule may be necessary (e.g., less than one truck per hour). Composite all samples for the period into an eight-hour composite. Containerize, label, and set aside for further processing.

11.2.4.4 Collect a second eight-hour composite during the course of the work day. The second composite should be collected during a different shift from the first composite.

11.2.4.5 For an initial waste characterization, collect samples each day for a minimum of one week's operation (i.e., fourteen composite samples).

11.3 Analysis

11.3.1 Each composite sample shall be tested, using Method 1311 [Toxicity Characteristic Leaching Procedure (TCLP)], and the results analyzed, to determine whether the ash passes or fails the TC as defined in the DRGHW, §261.24.

11.3.2 All testing shall be performed following the specific procedures described in "Test Methods for Evaluating Solid Waste" (SW-846).

11.3.3 The testing shall be performed by an independent laboratory.

11.3.4 In lieu of TCLP, testing for total concentration of constituents (i.e., the contaminants listed in DRGHW, §261.24, Table 1) may be performed. If no constituent is present at a concentration exceeding the TC regulatory limit, the waste may be considered non-hazardous. However, if the concentration of any constituent exceeds the TC regulatory limit, TCLP must be performed to determine whether the waste is hazardous.

11.3.5 If it has been demonstrated that none of the organic constituents listed in DRGHW, §261.24, Table 1, is present in the ash at a detectable level, the ash need not be routinely tested for the organics.

11.4 Quality Assurance And Quality Control

The sampling and analysis plan shall include:

11.4.1 A detailed description of the steps that will be taken to ensure quality control, and

11.4.2 A provision for appointing a knowledgeable person to oversee the sampling and analysis program to ensure that all procedures are followed.

11.5 Data Evaluation

The following approach shall be used in evaluating the data to determine whether the ash passes or fails the TC (see SW-846, Chapter Nine, Tables 9-1 and 9-2 for statistical formulas to use in making the calculations):

11.5.1 Determine the mean TC concentration (x) of the fourteen eight-hour composite samples for each regulated analyte (equation 2a of Table 9-1).

11.5.2 Determine the standard deviation(s) of the data employed to calculate the mean (i.e., the individual composite results) (equation 3a and 4 of Table 9-1).

11.5.3 Determine the upper bound of the 90 percent (one-sided) confidence interval for the mean for each analyte (equation 6 of Table 9-1).

If the upper bound of the interval is below the applicable regulatory threshold for all analytes listed in DRGHW, §261.24, then the waste passes the TC. If the upper bound of the interval is above the applicable regulatory threshold for any analyte listed in DRGHW, §261.24, then the waste fails the TC.

12.0 Severability

If any provision of these regulations, or the application of any provision of these regulations to any person or circumstance, is held invalid, the application of such provision to other persons or circumstances, and the remainder of these regulations, shall not be affected thereby.

2 DE Reg. 1545 (3/1/99)
4 DE Reg. 1855 (5/1/01)
8 DE Reg. 354 (8/1/04)
11 DE Reg. 459 (10/01/07) (Prop.)