



South Carolina Department of Health
and Environmental Control

Regulation 61-107.16

SWM: Industrial Solid Waste Landfills

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**Bureau of Land & Waste Management
Division of Mining & Solid Waste Management
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DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
CHAPTER 61
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44-96-300, 44-96-320, 44-96-450, and 44-96-460

R. 61-107.16. Solid Waste Management: Industrial Solid Waste Landfills.

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SUBPART A

16.1. PURPOSE, SCOPE, AND APPLICABILITY

a. The purpose of this regulation is to establish minimum criteria under the South Carolina Solid Waste Policy and Management Act, S.C. Code Ann. Sections 44-96-10 *et seq.* (1976 Code as amended), and all applicable federal regulations, for all industrial solid waste landfill (ISWLF) facilities. These minimum criteria ensure the protection of human health and the environment.

b. This regulation applies to all new and existing ISWLF facilities.

c. Existing ISWLFs are not subject to the location criteria outlined in Subpart B or the design criteria outlined in Subpart D, but are subject to all other provisions of this regulation.

d. This regulation becomes effective sixty (60) days after publication as final in the State Register. With prior written approval, the Department may allow the submittal of a compliance schedule in order to comply with the requirements of this regulation.

e. Existing ISWLFs that do not meet the siting criteria outlined in Subpart B or the design criteria outlined in Subpart D, and which have confirmed exceedances of environmental standards must, within six (6) months of the date that the exceedance of environmental standards has been confirmed, establish a compliance schedule with the Department for correction of the cause and the exceedance, or for the closure of all areas of the ISWLF which have received waste. Areas of ISWLFs described in this paragraph which have not received waste will be subject to all provisions of this regulation. The closure of the filled areas must comply with the closure criteria outlined in section 16.60 and post-closure care requirements in section 16.61.

f. All new ISWLFs must be in compliance with all requirements of this regulation prior to receipt of waste.

g. Permanently located Industries may use certain solid waste that is generated on-site for structural fill. Such activities are exempt from the requirements of this regulation if the site will:

(1) Provide structural fill of areas with a beneficial end use;

(2) Have controlled access through the use of fences, gates or natural barriers, or other means to prevent promiscuous dumping and unauthorized access; and,

(3) Receive only those items listed below that are generated as a result of manufacturing operations on property under the same ownership or control as the structural fill activity and that have not been in direct contact with hazardous constituents (e.g., pesticides, etc.), petroleum products, or painted with lead-based paint:

(a) hardened concrete;

(b) brick;

(c) block;

(d) untreated lumber; and,

(e) other items specifically approved in writing by the Department.

h. No facility for the disposal of industrial solid waste shall be operated in the State of South Carolina without first obtaining a written permit from the South Carolina Department of Health and Environmental Control.

16.2. DEFINITIONS

a. "Active life" means the period of operation beginning with the initial receipt of industrial waste and ending at completion of closure activities in accordance with section 16.60 of this part.

b. "Active portion" means that part of a facility that has received or is receiving wastes and that has not been closed in accordance with section 16.60 of this part.

c. "Aquifer" means a geological formation, group of formations, or portion of a formation capable of yielding significant quantities of groundwater to wells or springs.

d. "Class GA groundwater" is defined in South Carolina DHEC R.61-68, Water Classifications and Standards.

e. "Commercial ISWLF" means an ISWLF which accepts solid waste from more than one generator unless the generator(s) is a subsidiary or a related corporation.

f. "Confirmed exceedance of environmental standard" means an exceedance of an environmental standard which has been confirmed by testing and comparison to environmental standards.

- g. "Department" means the South Carolina Department of Health and Environmental Control, or "DHEC."
- h. "Environmental Standard" means any statutorily required standard by which environmental compliance is measured by the Department.
- i. "Existing ISWLF" means any industrial solid waste landfill that is permitted to receive industrial solid waste as of the effective date of this regulation. Waste placement in existing ISWLFs must be consistent with past operating practices or modified practices to ensure good management.
- j. "Facility" means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of industrial solid waste.
- k. "Generator" means, for the purpose of this regulation only, any person, by site, whose act or process produces solid waste, or whose act first causes a solid waste to become subject to regulation.
- l. "Groundwater" means water below the land surface in a zone of saturation.
- m. "High water table" means the highest water elevations measured at the uppermost aquifer in on-site monitoring wells for a period consisting of four (4) consecutive quarters.
- n. "Industrial solid waste landfill" means an area of land or an excavation in which industrial solid wastes are placed for permanent disposal and which is permitted pursuant to this regulation or to South Carolina DHEC R.61-66, Industrial Waste Disposal Sites and Facilities and/or South Carolina DHEC R.61-70, Sanitary Landfill Design, Construction, and Operation. Such a landfill may be publicly or privately owned. The landfill may be a new ISWLF landfill, or an existing ISWLF landfill.
- o. "Industrial solid waste" means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under subtitle C of RCRA. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: Electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste.
- p. "Landfill" means a disposal facility or part of a facility where solid waste is placed in or on land, and which is not a land treatment facility, a surface impoundment, or an injection well.
- q. "Leachate" means a liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste.
- r. "New ISWLF" means any industrial solid waste landfill that has not been issued a permit to receive industrial solid waste prior to the effective date of this regulation.
- s. "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.

t. "Operator" means any person, including the owner, who is principally engaged in, or is in charge of, the actual operation, supervision, and maintenance of an industrial solid waste management facility and includes the person in charge of a shift or period during any part of the day.

u. "Owner" means the person(s) who owns a facility or part of a facility.

v. "Perennial stream" means a stream or reach of a stream that flows continuously throughout the year and whose upper surface generally stands lower than the water table in the region adjoining the stream.

w. "Recharge area" for a particular aquifer is defined as areas where water enters the aquifer through downward migration. Principal examples include: outcrop areas of a particular aquifer where the potentiometric head within the unit decreases with depth; and, in the subsurface, where the potentiometric head relationship and leakage factors across any confining unit allow for downward flow into other aquifer systems.

x. "Run-off" means any rainwater, leachate, or other liquid that drains over land from any part of a facility.

y. "Run-on" means any rainwater, leachate, or other liquid that drains over land onto any part of a facility.

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

aa. "Sludge" means any solid, semi-solid, 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.

bb. "Solid waste" means any garbage, or refuse, sludge from a waste treatment facility, water supply plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities. This term does not include solid or dissolved materials in domestic sewage, recovered materials, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to NPDES permits under the Federal Water Pollution Control Act, as amended, or the Pollution Control Act of South Carolina, as amended, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended. Also excluded from this definition are application of fertilizer and animal manure during normal agricultural operations or refuse as defined and regulated pursuant to the South Carolina Mining Act, including processed mineral waste, which will not have a significant adverse impact on the environment.

cc. "State" means the State of South Carolina.

dd. "Structural integrity" means the ability of a landfill to withstand physical forces exerted upon designed components, appurtenances, and containment structures (e.g., liners, dikes) of the landfill.

ee. "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.

ff. "Waste management boundary" means a vertical surface located at the hydraulically downgradient limit of the waste disposal area. This vertical surface extends down into the uppermost aquifer.

16.3. [Reserved]

16.4. INDUSTRIAL WASTE TESTING AND WASTE STREAM DETERMINATION

a. In order to determine the appropriate industrial solid waste classification, the owner or operator shall supply to the Department a comprehensive determination of the chemical and physical nature of the waste stream being disposed in the ISWLF. Industrial solid waste shall be sampled in accordance with sections 16.4.b., c. and e. and section 16.20. and the nature of the waste (i.e., sludge, petroleum contaminated soils, slag, debris, etc.). An extract shall be obtained and tested in accordance with section 16.4.d.

b. Mixing of individual wastes to be disposed prior to testing is acceptable only if:

(1) The individual wastes are mixed prior to discharge in the normal production process of the generator or the individual wastes are generated by identical industrial processes and identical raw materials; or

(2) The mixing of individual wastes results in a waste in which leaching characteristics are reduced relative to one or more of the individual wastes due to attenuation factors other than dilution, such as precipitation, adsorption, or ion exchange; and

(a) A demonstration is submitted to the Department for review and approval that details how a reduction in leaching occurs due to some factor other than dilution. The demonstration shall include, at a minimum:

(i) The concentration, determined in accordance with the requirements of this section, for each parameter which undergoes a reduction in concentration. Concentrations of parameters shall be determined for each individual waste in the mixture and for each parameter as a result of the mixture;

(ii) A listing and the ratio, by weight and volume, of the individual wastes which comprise the mixture;

(iii) Calculations using the concentration and weight data required in section 16.4.b.(2)(i) and b.(2)(ii), which demonstrate quantitatively that the reduction in leaching characteristics is not solely due to dilution; and,

(iv) An identification and explanation of the chemical reactions, including chemical equations, which cause the reduction.

(b) The individual wastes are mixed in the same ratios and in the same manner in which they will be mixed prior to disposal during the normal operation of the industrial waste landfill.

c. All samples of industrial waste shall be composite samples as described in section 9.1.1.4.1. of EPA Publication SW-846 [Third Edition (November 1986), as amended by Updates I, (July, 1992), II (September, 1994), IIA (August, 1993), and IIB (January, 1995)], and the sampler shall employ all reasonable measures, such as sampling different sources of industrial solid waste at different times, or conducting random sampling of a representative pile of the industrial waste generated from different sources at different times, to ensure that representative composite samples are obtained.

d. The toxicity characteristic leaching procedure (TCLP) (USEPA method 1311), or equivalent methods approved by the Department under the procedures set forth in section 16.4.k., shall be used to obtain all extracts for the purpose of characterizing an industrial solid waste proposed for disposal in a industrial solid waste landfill. For the purpose of obtaining an extract which will be analyzed for any volatile organic

compounds, a zero headspace extraction apparatus, as specified in the TCLP, shall be used. Detection limits for the analytical methods shall be below the Maximum Contaminant Level (MCL) published in the South Carolina DHEC R.61-58, State Primary Drinking Water Regulations, current at the time of permit application, when practically possible.

e. For the initial characterization of industrial solid waste to be disposed in an industrial waste landfill, a minimum of two (2) representative samples of the waste shall be collected and tested in accordance with the TCLP procedure. TCLP testing of additional samples of the industrial solid waste may be required by the Department, based on a high degree of variability in the concentration of a parameter at or near the maximum allowable concentration for a particular landfill class. The Department may allow with prior approval, the testing for selected constituents based on the generators knowledge of the process.

f. After the effective date of this regulation, all industrial solid waste landfills shall characterize the appropriate industrial waste stream(s) in accordance with sections 16.4.a. to 16.4.e. of this regulation:

(1) At least every five (5) years;

(2) Whenever the production process or raw materials used in the production process change significantly enough to alter the chemical makeup of the industrial waste;

(3) When new waste streams are proposed for disposal in the industrial waste landfill; or

(4) According to an alternate schedule based on the variability or non-variability noted in previous sampling events, or other factors affecting the predictability of waste characteristics.

g. The owner or operator shall notify and obtain approval from the Department prior to making any physical or chemical changes to the waste stream being disposed in the ISWLF.

(1) Significant changes in the chemical or physical nature of the waste stream may require design changes to the construction of the landfill.

(2) Significant changes to the chemical or physical nature of the waste stream may require modification of the environmental monitoring program.

h. All testing of industrial solid waste shall be performed by a laboratory certified by South Carolina to perform the analysis outlined in this regulation. Test results performed by laboratories in other states will be reviewed on a case by case basis dependant upon documentation of use of EPA protocols.

i. The analytical results required in section 16.4.f. shall be submitted to the Department within sixty (60) days of sample collection. If the test results indicate that a landfill reclassification is necessary based on exceedance of landfill classification levels outlined in Section 16.5., the Department may require additional sampling and testing to confirm or reject such indication. If the indication is confirmed, the Department may require the permittee to submit a permit application for appropriate modifications to the industrial waste landfill. The required modifications shall ensure that the facility meets the requirements of the new landfill classification.

j. Waste materials listed in Appendix 1 of this regulation shall be exempt from the testing requirements and will be classified as Class 1 industrial solid wastes. Other industrial solid wastes which demonstrate characteristics similar to wastes listed in Appendix 1, may be exempted from the testing requirements and classified as Class 1 industrial solid wastes. This exemption may be granted by the Department on a case by case basis.

k. Any person seeking to utilize a testing or analytical method other than the method described in section 16.4.d. may request authorization to do so. To be successful, the applicant must demonstrate to the satisfaction of the Department that the proposed method is equal to or superior to the method described in section 16.4.d. in terms of its sensitivity, accuracy, and precision (i.e., reproducibility). The request shall include, at a minimum:

- (1) A full description of the proposed method, including all procedural steps and equipment used in the method;
- (2) A description of the types of wastes or waste matrices for which the proposed method may be used;
- (3) Comparative results obtained from using the proposed method with those obtained from using the relevant or corresponding method prescribed in section 16.4.d.;
- (4) An assessment of any factors which may interfere with, or limit the use of, the proposed method;
- (5) A description of the quality control procedures necessary to ensure the sensitivity, accuracy, and precision of the proposed method; and,
- (6) Any other information on the proposed method which the Department may reasonably request to evaluate the proposed method.

16.5. INDUSTRIAL SOLID WASTE LANDFILL CLASSIFICATIONS

a. Based on the results obtained from the testing performed in section 16.4., industrial solid waste landfills will be given a classification by the Department. Industrial solid waste landfills shall be constructed and operated in accordance with requirements of the assigned classification.

b. Industrial solid waste landfills shall be classified based on the following test results:

(1) Class 1 industrial solid waste landfills shall be allowed to dispose of wastes that test less than or equal to ten (10) times the Maximum Contaminant Level (MCL) published in the South Carolina DHEC R.61-58, State Primary Drinking Water Regulations current at the time of permit application. Waste materials listed in Appendix 1 of this regulation shall be exempt from the testing requirements and will be classified as Class 1 industrial solid wastes. Other industrial solid wastes which demonstrate properties similar to wastes listed in Appendix 1, may be exempted from the testing requirements and classified as Class 1 industrial solid wastes. This exemption may be granted by the Department on a case by case basis.

(2) Class 2 industrial solid waste landfills shall be allowed to dispose of wastes that test greater than ten (10) times the MCL and less than or equal to thirty (30) times the MCL as published in the South Carolina DHEC R.61-58, State Primary Drinking Water Regulations current at the time of permit application.

(3) Class 3 industrial solid waste landfills shall be all other industrial solid waste landfills accepting waste that is not determined to be a hazardous waste in accordance with the South Carolina DHEC R.61-79, Hazardous Waste Management Regulations.

c. Commercial ISWLF facilities which accept industrial solid waste from varied industrial facilities will be classified based on the waste streams accepted by the landfill. If the owner or operator of the commercial ISWLF can not provide a complete listing and appropriate analytical data on all wastes to be disposed, the

facility must meet all requirements for a Class 3 industrial solid waste landfill.

d. Industrial solid waste streams that contain chemicals or chemical properties potentially harmful to human health and the environment, for which TCLP, or other approved testing procedures, as outlined in section 16.4.k., is not sufficient, shall be classified on a case by case basis by the Department. The permit applicant may be required to perform alternate testing procedures as necessary to determine the potential adverse effects to human health and the environment.

e. If an alternate testing method, as allowed under section 16.4.k., is utilized to characterize a solid waste stream, the ISWLF classifications specified in section 16.5.b. may be adjusted based upon the information provided with the request for the use of an alternate testing method.

16.6. INDUSTRIAL WASTE CHARACTERIZATION REPORT

a. All ISWLF facilities shall, within one hundred eighty (180) days of the effective date of this regulation or prior to permit issuance, whichever is later, submit a waste characterization report which contains at a minimum, the following:

(1) A listing of each industrial solid waste proposed for disposal in the facility, and its approximate percentage and volume of the total waste stream;

(2) The industrial solid waste sampling plan used to ensure that accurate and representative samples will be collected in accordance with section 16.4.;

(3) A detailed description of any mixing to be proposed as described in section 16.4.b., and any available information which will be required by that section;

(4) All laboratory results and quality assurance/quality control documentation that fully characterizes each industrial waste; and

(5) The name, location, and contact person of each generator of industrial solid waste to be disposed at the facility.

(6) For facilities disposing of Appendix 1 wastes only, the waste characterization report shall consist of items (1) and (5) above.

b. Existing ISWLFs may submit a statement to the Department, in lieu of the waste characterization report, that the Department has the required information on file, specifying when and to whom the information was submitted and agreeing to respond to specific questions the Department may have regarding the information on file.

16.7. - 16.9. [Reserved]

SUBPART B - LOCATION RESTRICTIONS

16.10. [Reserved]

16.11. FLOODPLAINS

a. Owners or operators of new ISWLFs located in one hundred (100) year floodplains must demonstrate

that the ISWLF will not restrict the flow of the one hundred (100) year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of industrial solid waste so as to pose a hazard to human health and the environment. The owner or operator must place the demonstration in the operating record and notify the Department that it has been placed in the operating record.

b. For purposes of this section:

(1) "Floodplain" means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, that are inundated by the one hundred (100) year flood.

(2) "One hundred (100) year flood" means a flood that has a one (1) percent or greater chance of recurring in any given year or a flood of a magnitude equaled or exceeded once in one hundred (100) years on the average over a significantly long period.

(3) "Washout" means the carrying away of industrial solid waste by waters of the base flood.

16.12. WETLANDS

a. New ISWLFs shall not be located in wetlands, unless the owner or operator can make the following demonstrations to the Department:

(1) Where applicable under section 404 of the Clean Water Act, 33 USC section 1344, or other applicable State wetlands laws, the presumption that a practicable alternative to the proposed landfill is available which does not involve wetlands is clearly rebutted:

(2) The construction and operation of the ISWLF will not:

(a) Cause or contribute to violations of any applicable State water quality standard,

(b) Violate any applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act, 33 USC section 1344,

(c) Jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of a critical habitat, protected under the Endangered Species Act of 1973, 16 USCA sections 668aa through ss, and

(d) Violate any requirement under the Marine Protection, Research, and Sanctuaries Act of 1972, 16 USC sections 1431 *et seq.*, for the protection of a marine sanctuary;

(3) The ISWLF will not cause or contribute to significant degradation of wetlands. The owner/operator must demonstrate the integrity of the ISWLF and its ability to protect ecological resources by addressing the following factors:

(a) Erosion, stability, and migration potential of native wetland soils, muds and deposits used to support the ISWLF;

(b) Erosion, stability, and migration potential of dredged and fill materials used to support the ISWLF;

(c) The volume and chemical nature of the waste managed in the ISWLF;

(d) Impacts on fish, wildlife, and other aquatic resources and their habitat from release of the

industrial solid waste;

(e) The potential effects of catastrophic release of waste to the wetland and the resulting impacts on the environment; and

(f) Any additional factors, as necessary, to demonstrate that ecological resources in the wetland are sufficiently protected.

(4) To the extent required under section 404 of the Clean Water Act, 33 USC section 1344, or other applicable State wetlands laws, steps have been taken to attempt to achieve no net loss of wetlands (as defined by acreage and function) by first avoiding impacts to wetlands to the maximum extent practicable as required by paragraph a.(1) of this section, then minimizing unavoidable impacts to the maximum extent practicable, and finally offsetting remaining unavoidable wetland impacts through all appropriate and practicable compensatory mitigation actions (e.g., restoration of existing degraded wetlands or creation of man-made wetlands); and

(5) Sufficient information is available to make a reasonable determination with respect to these demonstrations.

b. For purposes of this section, *wetlands* means those areas that are defined in 40 Code of Federal Regulations (CFR) 232.2(r).

c. In lieu of the demonstration required by subsection (a) of this section, the applicant may submit proof that it has obtained the permits and/or authorizations required by all other state and federal laws and regulations applicable to the use of such wetlands.

16.13. FAULT AREAS

a. New ISWLFs designed and constructed with a liner and leachate collection system shall not be located within two hundred (200) feet (60 meters) of a fault that has had displacement in Holocene time unless the owner or operator demonstrates to the Department that an alternative setback distance of less than two hundred (200) feet (60 meters) will prevent damage to the structural integrity of the ISWLF and will be protective of human health and the environment.

b. For the purposes of this section:

(1) "Fault" means a fracture or a zone of fractures in any material along which strata on one side have been displaced with respect to that on the other side.

(2) "Displacement" means the relative movement of any two (2) sides of a fault measured in any direction.

(3) "Holocene" means the most recent epoch of the Quaternary period, extending from the end of the Pleistocene Epoch to the present.

16.14. SEISMIC IMPACT ZONES

a. New ISWLFs designed and constructed with a liner and leachate collection system shall not be located in seismic impact zones, unless the owner or operator demonstrates to the Department 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. The owner or operator must

place the demonstration in the operating record and notify the Department that it has been placed in the operating record.

b. For the purposes of this section:

(1) "Seismic impact zone" means an area with a ten (10) 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 two hundred fifty (250) years.

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

(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.

16.15. UNSTABLE AREAS

a. Owners or operators of new ISWLFs designed and constructed with a liner and leachate collection system located in an unstable area must demonstrate that engineering measures have been incorporated into the ISWLFs design to ensure that the integrity of the structural components of the ISWLF will not be disrupted. The owner or operator must place the demonstration in the operating record and notify the Department that it has been placed in the operating record. The owner or operator must consider the following factors, at a minimum, when determining whether an area is unstable:

(1) On-site or local soil conditions that may result in significant differential settling;

(2) On-site or local geologic or geomorphologic features; and

(3) On-site or local human-made features or events (both surface and subsurface).

b. For purposes of this section:

(1) "Unstable area" means a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components responsible for preventing releases from a landfill. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and Karst terrains.

(2) "Structural components" means liners, leachate collection systems, final covers, run-on/run-off systems, and any other component used in the construction and operation of the ISWLF that is necessary for protection of human health and the environment.

(3) "Poor foundation conditions" means those areas where features exist which indicate that a natural or man-induced event may result in inadequate foundation support for the structural components of an ISWLF.

(4) "Areas susceptible to mass movement" means those areas of influence (i.e., areas characterized as having an active or substantial possibility of mass movement) where the movement of earth material at, beneath, or adjacent to the ISWLF, because of natural or man-induced events, results in the downslope transport of soil and rock material by means of gravitational influence. Areas of mass movement include, but

are not limited to, landslides, avalanches, debris slides and flows, soil fluctuation, block sliding, and rock fall.

(5) "Karst terrains" means areas where karst topography, with its characteristic surface and subterranean features, is developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terrains include, but are not limited to, sinkholes, sinking streams, caves, large springs, and blind valleys.

16.16. [Reserved]

16.17. [Reserved]

16.18. BUFFER ZONES

a. All new ISWLFs shall meet the following buffer zone requirements at the time of the initial public notice:

(1) The ISWLF shall not be located within one hundred (100) feet of any property line not under control of the owner or operator.

(2) The ISWLF shall not be located within two hundred (200) feet of any surface water body which holds visible water for greater than six (6) consecutive months, excluding ditches, sediment ponds, and other operational features on the site.

(3) Non-commercial ISWLFs shall not be located within two hundred (200) feet of any residences, schools, hospitals, churches, and publicly owned recreational park areas, unless such features are included in the site design for a planned end-use.

(4) Commercial ISWLFs shall not be located within one thousand (1000) feet of any residences, schools, hospitals, churches, and publicly owned recreational park areas, unless such features are included in the site design for a planned end-use.

(5) The ISWLF shall not be located within the following distances from any well used as a source of water for human consumption, that is in a hydrologic unit potentially affected by the landfill. Exemptions may be granted by the Department if the applicant can demonstrate to the satisfaction of the Department that the hydrologic conditions below the landfill provide protection to the aquifer in use:

(a) Less than five hundred (500) feet hydraulically downgradient of the groundwater well;

(b) Less than seven hundred fifty (750) feet hydraulically sidegradient of the groundwater well; and,

(c) Less than one thousand (1000) feet upgradient of the groundwater well.

(6) The bottom elevation of the landfill excavation shall be a minimum of two (2) feet above the seasonal high water table as it exists prior to construction of the disposal area. The seasonal high water table elevation shall be based on interpretation of the data obtained from a representative number of monitoring wells approved by the Department. In cases where there is insufficient information to support the seasonal high water table elevation determination, additional separation may be required by the Department.

(7) The bottom elevation of the landfill excavation shall be a minimum of ten (10) feet above bedrock. This vertical separation may consist of naturally occurring or engineered material which can be maintained between the base of the constructed landfill and bedrock; provided, however, the nature of the material and

sufficient separation exists to provide for installation and operation of an effective groundwater monitoring system. The nature of the material making up this interval is subject to Department approval.

b. [Reserved]

16.19. [Reserved]

SUBPART C - OPERATING CRITERIA

16.20. PROCEDURES FOR EXCLUDING THE RECEIPT OF UNAPPROVED WASTE, PCB CONTAINING WASTE, AND HAZARDOUS WASTE

a. Owners or operators of all ISWLFs must implement a program at the facility for detecting and preventing the disposal of regulated hazardous wastes as defined in the South Carolina DHEC R.61-79.261, Hazardous Waste Management Regulations, polychlorinated biphenyls (PCB) wastes as defined in RCRA Part 761, and wastes not specifically allowed by the permit. This program must include, at a minimum:

(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, PCB wastes, or wastes not specifically allowed by the permit;

(2) Records of any inspections;

(3) Training of facility personnel to recognize wastes not specifically allowed by the permit, regulated hazardous waste and PCB wastes; and

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

b. For purposes of this section, "regulated hazardous waste" means an industrial solid waste that is a hazardous waste, as defined in R.61-79.261.3, that is not excluded from regulation as a hazardous waste under R.61-79.261.4(b) or was not generated by a conditionally exempt small quantity generator as defined in R.61-79.261.5.

c. The ISWLF shall, prior to receipt of any waste materials which are not specifically listed in the permit application, submit for Department approval, and implement, a plan to analyze and characterize the waste materials to determine the suitability for disposal in the landfill.

d. An owner or operator may provide information concerning an existing program which prevents the disposal of industrial solid waste which is not allowed by permit, regulated hazardous waste, and PCB containing waste. The Department may allow the continued use of the existing program in lieu of the program described in Section 16.20.a. through c., provided the owner or operator can demonstrate that the existing program is effective.

16.21. COVER MATERIAL REQUIREMENTS

a. Except as provided in paragraphs c. and d. of this section, the owners or operators of all ISWLFs must cover disposed industrial solid waste with six (6) inches of earthen material at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging.

b. The industrial waste disposal facility shall have an adequate quantity of acceptable earth (or approved alternate) cover for routine operations. If the material does not originate on site, the permit application should indicate the calculated volume of material needed for cover, provide assurances that off-site quantities of cover material are available, the location of any earth stockpiles, and any provisions for saving topsoil for use as final cover. The earth cover material shall be easily workable and compactable, shall be free of large objects that would hinder compaction, and shall not contain organic matter conducive to the harborage and/or breeding of vectors or nuisance animals.

c. Alternative materials of an alternative thickness (other than at least six (6) inches of earthen material) may be approved by the Department on a case by case basis if the owner or operator demonstrates that the alternative material and thickness control disease vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the environment.

d. The Department may approve an alternate frequency of cover placement, or not require cover placement, based upon the physical and chemical nature of the waste stream, on a case by case basis.

16.22. DISEASE VECTOR CONTROL

a. Owners or operators of all ISWLFs must prevent or control on-site populations of disease vectors, as necessary, using techniques appropriate for the protection of human health and the environment.

b. For purposes of this section, "disease vectors" means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans.

16.23. EXPLOSIVE GASES CONTROL

a. Owners or operators of all ISWLFs must ensure, as necessary, that:

(1) The concentration of methane gas generated by the facility, if applicable, does not exceed twenty-five (25) percent of the lower explosive limit for methane in facility structures (excluding gas control or recovery system components); and

(2) The concentration of methane gas does not exceed the lower explosive limit for methane at the facility property boundary.

b. If applicable, owners or operators of all ISWLFs must implement a routine methane monitoring program to ensure that the standards of paragraph a. of this section are met.

(1) The type and frequency of monitoring must be determined based on the following factors:

(a) Soil conditions;

(b) The hydrogeologic conditions surrounding the facility;

(c) The hydraulic conditions surrounding the facility; and

(d) The location of facility structures and property boundaries.

(2) The minimum frequency of monitoring shall be quarterly.

c. If methane gas levels exceeding the limits specified in paragraph a. of this section are detected, the

owner or operator must:

(1) Immediately take all necessary steps to ensure protection of human health and notify the Department;

(2) Within seven (7) days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health; and

(3) Within sixty (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.

d. 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°C and atmospheric pressure.

16.24. AIR CRITERIA

a. [Reserved]

b. Open burning of industrial solid waste, except for the infrequent burning of agricultural wastes, silvicultural wastes, landclearing debris, diseased trees, or debris from emergency clean-up operations, all of which require prior Department approval, is prohibited at all ISWLFs.

c. Blowing litter shall be controlled at the ISWLF. The entire ISWLF facility shall be policed as necessary to remove any accumulations of blown litter.

16.25. ACCESS REQUIREMENTS

a. Owners or operators of all ISWLFs must control public access and prevent unauthorized vehicular traffic and illegal dumping of wastes by using artificial barriers, natural barriers, or both, as appropriate to protect human health and the environment.

b. An all-weather access road shall be provided to the site.

16.26. RUN-ON/RUN-OFF CONTROL SYSTEMS

a. Owners or operators of all ISWLFs must design, construct, and maintain:

(1) A run-on control system to prevent flow onto the active portion of the landfill during the peak discharge from a twenty five (25) year storm;

(2) A run-off control system from the active portion of the landfill to collect and control at least the water volume resulting from a twenty four (24) hour, twenty five (25) year storm.

b. Run-off from the active portion of the landfill must be properly handled.

16.27. [Reserved]

16.28. LIQUIDS RESTRICTIONS

a. Bulk or noncontainerized liquid waste may not be placed in ISWLFs unless:

(1) The waste is leachate or gas condensate derived from the ISWLF and the ISWLF, whether it is new or existing, is designed with a liner and leachate collection system as described in 16.40.a. of this regulation. Leachate or gas condensate may only be placed in the ISWLF on a temporary basis not to exceed ninety (90) days with Departmental approval to allow for leachate and gas condensate management during emergency situations.

(2) [Reserved]

b. For purposes of this section:

(1) "Liquid waste" means any waste material that is determined to contain "free liquids" as defined by Method 9095 (Paint Filter Liquids Test), as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (EPA Pub. No. SW-846, as amended by EPA final updates).

(2) "Gas condensate" means the liquid generated as a result of gas recovery process(es) at the ISWLF.

16.29. RECORDKEEPING REQUIREMENTS

a. The owner or operator of an ISWLF must record and retain near the facility in an operating record or in an alternative location approved by the Department the following information as it becomes available:

(1) Any location restriction demonstration required under Subpart B of this part;

(2) Inspection records, training procedures, and notification procedures required in section 16.20. of this part;

(3) Gas monitoring results from monitoring and any remediation plans required by section 16.23. of this part;

(4) Any demonstration, certification, finding, monitoring, testing, or analytical data required by Subpart E of this part;

(5) Closure and post-closure care plans, updates to the closure and post-closure care plan, and any monitoring, testing, or analytical data as required by section 16.60. and section 16.61. of this part;

(6) Any cost estimates and financial assurance documentation required by Subpart G of this part; and

(7) The results of any environmental monitoring or testing performed in accordance with this regulation or the operating permit for the facility.

b. All information contained in the operating record must be furnished upon request to the Department or be made available at all reasonable times for inspection by the Department.

c. The owner/operator of all commercial ISWLF facilities must record in an operating record, information concerning the type, weight, and county and State of origin of waste delivered to the facility. A summary of this information must be submitted to the Department no later than October 15 of each year, for the previous fiscal year, on a form approved by the Department.

d. The Department can set alternative schedules for recordkeeping and notification requirements as specified in paragraphs a. and b. of this section.

16.30. SCALE INSTALLATION

a. Each owner or operator of a commercial industrial solid waste landfill shall install and/or maintain scales capable of accurately determining the weight of incoming waste streams. All non-commercial industrial solid waste landfills must provide an annual estimate of the volume and weight of waste received.

b. [Reserved]

16.31. EQUIPMENT

a. The following equipment should be available as necessary to ensure operations as approved in the operating plan for the ISWLF facility:

(1) Equipment or adequate contractual arrangements for equipment sufficient for excavating, earth moving, spreading, compacting and covering operations;

(2) Sufficient reserve equipment, or arrangements to provide alternate equipment within twenty-four (24) hours following equipment breakdown; and,

(3) Equipment to extinguish fires or arrangements to provide for fire protection.

b. [Reserved]

16.32. SUPERVISION AND INSPECTION

a. Routine inspection and evaluation of landfill operations will be made by a representative of the Department. A notice of any deficiencies, together with any recommendations for their correction, will be provided to the owner or operator responsible for the operation of the ISWLF.

b. Inspection of all ISWLF facilities shall be made at completion of the closure period, and at the end of the post-closure care period by a representative of the Department. Any necessary corrective work shall be performed before the landfill project is accepted as completed.

16.33. LEACHATE HANDLING AGREEMENT

a. Facilities with a leachate collection system shall obtain either a legal document (contract, local permit, etc.) certifying acceptance of leachate by the operator of a permitted wastewater treatment facility for the discharge of leachate to that facility, or a State Pollutant Discharge Elimination System permit shall be obtained prior to initial receipt of waste at the facility.

b. Facilities which wish to discharge leachate to a wastewater treatment facility under the same ownership or control as the ISWLF must verify that the wastewater treatment facility is capable of treating the additional wastewater.

16.34. LEACHATE CONTROL

a. The owner or operator of a Class 2 or Class 3 ISWLF shall use its best efforts to ensure that the leachate head above the liner system does not exceed one (1) foot, except for brief periods not to exceed one (1) week, due to circumstances beyond the immediate control of the owner or operator.

b. [Reserved]

16.35. - 16.39. [Reserved]

SUBPART D -- DESIGN CRITERIA

16.40. DESIGN CRITERIA CLASS 1 ISWLF

a. New Class 1 ISWLFs shall be constructed in accordance with a design approved by the Department. The design drawings must show all dimensions, proposed trenching plans or original fill face and cover stockpile. Cross sections shall be included showing both the original and proposed fill elevations.

b. The constructed landfill subgrade material shall minimize organic material and consist of on-site soils or select fill as approved by the Department.

c. The landfill subgrade shall be graded in accordance with the requirements of the approved engineering plans, reports and specifications.

d. One permanent survey benchmark of known elevation measured from a U.S. Geological Survey benchmark shall be established and maintained at the site. This benchmark will be the reference point for establishing horizontal and vertical elevation control.

e. A separation of two (2) feet shall be maintained between the base of the constructed disposal area and the high water table as determined by section 16.18.a.(6).

f. All storm water ditches should have a minimum slope of 0.5% or a minimum permissible non-silting velocity of two (2) feet per second. Alternative system design and maintenance which ensures proper run-on and run-off control may be approved by the Department.

g. [Reserved]

h. All excavations for waste disposal shall be at a slope of no less than two (2) percent to promote positive drainage across the bottom excavation surface and at a maximum slope not greater than thirty-three (33) percent to facilitate construction.

i. The Department may, on a case by case basis, approve other landfill designs, provided there is adequate information to demonstrate that the proposed design meets or exceeds the environmental and public health protection standards outlined in Subparts B, D and E of this regulation.

16.41. DESIGN CRITERIA CLASS 2 ISWLF

a. New Class 2 ISWLFs shall be constructed:

(1) With a clay liner, as defined in paragraph b. and k. of this section and a leachate collection system that is designed and constructed to maintain less than a one (1) foot depth of leachate over the liner, except in sumps, or

(2) In accordance with a design approved by the Department. The design must ensure that no concentration value for any constituent on the approved list of groundwater monitoring parameters exceeds the groundwater protection standard as specified in section 16.51.c. for that particular constituent, in the uppermost aquifer at the relevant point of compliance, as specified by the Department under section 16.51.

b. For purposes of this section, "clay liner" means a liner consisting of at least a two (2) foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec., or other approved material.

c. The leachate collection and removal system shall be designed and built to operate without clogging during the operational life of the site and post-closure maintenance period.

d. Filter layers shall be designed to prevent the migration of fine soil particles into a coarser grained material, and allow water or gases to freely enter a drainage medium (pipe or drainage blanket) without clogging.

e. The total thickness of the drainage and protective layers above the liner material shall be a minimum of two (2) feet thick, and shall be composed of material with a minimum hydraulic conductivity of 1×10^{-4} cm/sec.

f. All material used in the leachate collection and removal system of the landfill shall be designed to ensure that the hydraulic leachate head on the liner system does not exceed one (1) foot as a result of a twenty four (24) hour, twenty five (25) year storm event during the active life and post-closure period of the landfill facility.

g. A foundation analysis shall be performed to determine the structural integrity of the subgrade to support the horizontal and vertical stresses and overlying facility components.

(1) The constructed landfill subgrade material shall minimize organic material and consist of on-site soils or select fill as approved by the Department.

(2) The landfill subgrade shall be graded in accordance with the requirements of the approved engineering plans, reports and specifications. The material shall be sufficiently dry and structurally sound to ensure that the first lift and all succeeding lifts of soil placed over the landfill subgrade can adequately be compacted to the design requirements.

h. When approving a design that complies with paragraph a.(2) of this section, the Department shall consider at least the following factors:

(1) The hydrogeologic characteristics of the facility and surrounding land;

(2) The climatic factors of the area; and

(3) The volume and physical and chemical characteristics of the leachate.

i. One permanent survey benchmark of known elevation measured from a U.S. Geological Survey benchmark shall be established and maintained at the site. This benchmark will be the reference point for establishing horizontal and vertical elevation control.

j. A separation of two (2) feet shall be maintained between the base of the constructed liner system and the high water table as determined by section 16.18.a.(6).

k. The clay liner system shall conform with the following:

(1) The soil shall be placed on a slope of no less than two (2) percent to promote positive drainage across the liner surface and at a maximum slope not greater than thirty-three (33) percent to facilitate

construction.

(2) Compaction shall be performed by properly controlling the moisture content, lift thickness and other necessary details to obtain satisfactory results.

l. All storm water ditches should have a minimum slope of 0.5% or a minimum permissible non-silting velocity of two (2) feet per second. Alternative system design and maintenance which ensures proper run-on and run-off control may be approved by the Department.

m. For landfill expansions adjacent to existing ISWLFs, the Department may approve encroachment upon the existing landfill's side slopes only if a leachate barrier system is designed and constructed to eliminate leachate migration into the existing landfill. The expansion area shall be constructed in compliance with all applicable sections of this regulation.

n. A construction certification report shall be submitted to the Department within forty-five (45) days after the completion of construction of each lined area by an engineer registered in the state of South Carolina. This report shall include at a minimum, the information prepared in accordance with the application requirements. In addition, the construction certification report shall contain as-built drawings noting any deviations from the approved engineering plans. The construction certification report must include a comprehensive narrative by the engineer.

o. The Department may, on a case by case basis, approve other landfill designs, provided there is adequate information to demonstrate that the proposed design meets or exceeds the environmental and public health protection standards outlined in Subparts B, D and E of this regulation.

16.42. DESIGN CRITERIA CLASS 3 ISWLF

a. New Class 3 ISWLFs shall be constructed:

(1) With a composite liner, as defined in paragraph b. of this section and a leachate collection system that is designed and constructed to maintain less than a one (1) foot depth of leachate over the liner, except in sumps, or

(2) In accordance with a design approved by the Department. The design must ensure that no concentration values for any constituent on the approved list of groundwater monitoring parameters exceeds the groundwater protection standard as specified in section 16.51.c. for that particular constituent, in the uppermost aquifer at the relevant point of compliance, as specified by the Department under section 16.51.

b. For purposes of this section, "composite liner" means a system consisting of two (2) components; the upper component must consist of a minimum 30-mil flexible membrane liner (FML), and the lower component must consist of at least a two (2) foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec., or other approved material. FML components consisting of High Density Polyethylene (HDPE) shall be at least 60-mil thick. The FML component must be installed in direct and uniform contact with the compacted soil component.

c. The leachate collection and removal system shall be designed and built to operate without clogging during the operational life of the site and post-closure maintenance period.

d. Filter layers shall be designed to prevent the migration of fine soil particles into a coarser grained material, and allow water or gases to freely enter a drainage medium (pipe or drainage blanket) without clogging.

e. The total thickness of the drainage and protective layers above the liner material shall be a minimum of two (2) feet thick, and shall be composed of material with a minimum hydraulic conductivity of 1×10^{-4} cm/sec.

f. All material used in the leachate collection and removal system of the landfill shall be designed to ensure that the hydraulic leachate head on the liner system does not exceed one (1) foot as a result of a 24-hour, 25-year storm event during the active life and post-closure period of the landfill facility.

g. A foundation analysis shall be performed to determine the structural integrity of the subgrade to support the horizontal and vertical stresses and overlying facility components.

(1) The constructed landfill subgrade material shall minimize organic material and consist of on-site soils or select fill as approved by the Department.

(2) The landfill subgrade shall be graded in accordance with the requirements of the approved engineering plans, reports and specifications. The material shall be sufficiently dry and structurally sound to ensure that the first lift and all succeeding lifts of soil placed over the landfill subgrade can adequately be compacted to the design requirements.

h. When approving a design that complies with paragraph a.(2) of this section, the Department shall consider at least the following factors:

(1) The hydrogeologic characteristics of the facility and surrounding land;

(2) The climatic factors of the area; and

(3) The volume and physical and chemical characteristics of the leachate.

i. One permanent survey benchmark of known elevation measured from a U.S. Geological Survey benchmark shall be established and maintained at the site. This benchmark will be the reference point for establishing horizontal and vertical elevation control.

j. A separation of two (2) feet shall be maintained between the base of the constructed liner system and the high water table as determined by section 16.18.a.(6).

k. The soil component of the liner system shall conform with the following:

(1) The soil component of the liner system shall be placed on a slope of no less than two (2) percent to promote positive drainage across the liner surface and at a maximum slope not greater than thirty-three (33) percent to facilitate construction.

(2) Compaction shall be performed by properly controlling the moisture content, lift thickness and other necessary details to obtain satisfactory results.

l. The flexible membrane liner material shall demonstrate a chemical and physical resistance to waste placement or leachate generated by the landfill. Documentation shall be submitted to ensure chemical compatibility of the geomembrane liner material chosen, or in absence of the appropriate documentation, chemical compatibility testing will be performed using a test method acceptable to the Department. Flexible membrane liners shall be installed in accordance with the requirements of the approved engineering plans, report, specifications and manufacturer's recommendations.

m. All storm water ditches should have a minimum slope of 0.5% or a minimum permissible non-silting velocity of two (2) feet per second. Alternative system design and maintenance which ensures proper run-on and run-off control may be approved by the Department.

n. For landfill expansions adjacent to existing ISWLFs, the Department may approve encroachment upon the existing landfill's side slopes only if a leachate barrier system is designed and constructed to eliminate leachate migration into the existing landfill. The expansion area shall be constructed in compliance with all applicable sections of this regulation.

o. A construction certification report shall be submitted to the Department within forty-five (45) days after the completion of construction of each lined area by an engineer registered in the State of South Carolina. This report shall include at a minimum, the information prepared in accordance with the application requirements. In addition, the construction certification report shall contain as-built drawings noting any deviations from the approved engineering plans. The construction certification report must include a comprehensive narrative by the engineer.

p. The Department may, on a case by case basis, approve other landfill designs, provided there is adequate information to demonstrate that the proposed design meets or exceeds the environmental and public health protection standards outlined in Subparts B, D and E of this regulation.

16.43. - 16.49. [Reserved]

SUBPART E -- GROUNDWATER MONITORING AND CORRECTIVE ACTION

16.50. APPLICABILITY

a. The requirements in this subpart apply to all Class 1, Class 2, and Class 3 industrial solid waste landfills, except Class 1 industrial solid waste landfills which dispose only of wastes listed in Appendix 1. Other Class 1 industrial solid waste landfills which dispose of wastes which have been exempted from the testing requirements in accordance with Section 16.4.j. may also be exempted from the requirements of this section on a case by case basis.

b. All submittals made to the Department in compliance with this subpart shall be certified by a qualified registered professional geologist or qualified registered professional engineer.

c. Existing ISWLFs not performing groundwater monitoring prior to the effective date of this regulation shall submit a groundwater monitoring plan to be approved by the Department which meets the requirements of Subpart E to determine if any groundwater monitoring standard has been exceeded as required by section 16.1.c. The groundwater monitoring plan should be submitted within ninety (90) days of the effective date of this regulation.

d. Existing ISWLFs performing groundwater monitoring shall certify compliance with the requirements of this subpart within ninety (90) days of the effective date of this regulation.

16.51. RELEVANT POINT OF COMPLIANCE

a. The groundwater monitoring plan shall specify the relevant point of compliance at which the groundwater protection standard as specified in section 16.51.c. will be applicable. The relevant point of compliance is a vertical surface located no more than five hundred (500) feet from the hydraulically downgradient limit of the ISWLF that extends down into the uppermost aquifer underlying the ISWLF. The relevant point of compliance shall be located on land owned by the owner of the ISWLF.

b. The relevant point of compliance shall be specified by the permit applicant and approved by the Department. In determining the relevant point of compliance, the applicant shall document that the following factors have been considered:

- (1) The hydrogeologic characteristics of the facility and surrounding land;
- (2) The volume and physical and chemical characteristics of the leachate;
- (3) The quantity, quality, and direction of flow of groundwater;
- (4) The proximity and withdrawal rate of the groundwater users;
- (5) The availability of alternative drinking water supplies;

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

- (7) Public health, safety, and welfare effects; and
- (8) Practicable capability of the owner or operator.

c. The groundwater protection standard for ISWLFs shall consist of:

(1) The Maximum Contaminant Level (MCL) published in the South Carolina DHEC R.61-58, State Primary Drinking Water Regulations, for those constituents with a MCL;

(2) For those constituents which have no MCL, the background concentration or the concentration determined by appropriate health based criteria; or,

(3) Background concentrations when the MCL is exceeded in the background monitoring well(s).

16.52. GROUNDWATER MONITORING SYSTEMS

a. A groundwater monitoring system must be installed that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield representative groundwater samples from the uppermost aquifer that:

(1) Represent the quality of background groundwater that has not been affected by leakage from an ISWLF. A determination of background quality may include sampling of wells that are not hydraulically upgradient of the waste management area where:

(a) Hydrogeologic conditions do not allow the owner or operator to determine what wells are hydraulically upgradient; or

(b) Sampling at other wells will provide an indication of background groundwater quality that is as representative or more representative than that provided by the upgradient wells.

(2) Represent the quality of groundwater passing the relevant point of compliance.

b. [Reserved]

c. Monitoring wells must be approved by the Department prior to installation and constructed, at a minimum, to the standards established in the South Carolina DHEC R.61-79, Well Standards and Regulations.

(1) The owner or operator must notify the Department of the design, installation, development, and decommission of any monitoring wells, piezometers and other measurement, sampling, and analytical devices; and,

(2) The monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to design specifications throughout the life of the monitoring program.

d. The number, spacing, and depths of monitoring systems shall be:

(1) Determined based upon site-specific technical information that must include thorough characterization of:

(a) Aquifer thickness, groundwater flow rate, groundwater flow direction including seasonal and temporal fluctuations in groundwater flow; and,

(b) Saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the confining unit defining the lower boundary of the uppermost aquifer; including, but not limited to: thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities and effective porosities.

16.53. GROUNDWATER SAMPLING AND ANALYSIS REQUIREMENTS

a. The groundwater monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality. The owner or operator must submit to the Department for review and approval, the sampling and analysis procedures and protocols to be used at the facility. The program must include procedures and techniques for:

- (1) Sample collection;
- (2) Sample preservation and shipment;
- (3) Analytical procedures;
- (4) Chain of custody control; and
- (5) Quality assurance and quality control.

b. The groundwater monitoring program must include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents and other monitoring parameters in groundwater samples. Detection limits for those parameters that have a MCL, shall be, at a minimum, below the established MCL. Groundwater samples required by this paragraph shall not be field-filtered prior to laboratory analysis.

c. The sampling procedures and frequency must be protective of human health and the environment.

d. Groundwater elevations must be measured in each well prior to purging, each time groundwater is sampled. The owner or operator must determine the rate and direction of groundwater flow each time groundwater is sampled. Groundwater elevations in wells which monitor the same waste management area must be measured on the same day to avoid temporal variations in groundwater flow which could preclude an accurate determination of groundwater flow rate and direction.

e. The owner or operator must establish background groundwater quality in the hydraulically upgradient or background well(s) for each of the constituents required in the groundwater monitoring program that applies to the ISWLF. In order to establish background groundwater quality in a reasonable period of time, the owner or operator must collect and analyze a minimum of four (4) independent groundwater samples from each background well prior to the end of the first year of groundwater sampling. The Department may, on a case-by-case basis, approve an alternate subset of wells to be sampled for the establishment of background groundwater quality. Pursuant to section 16.52.a.(1), the above samples must represent the quality of background groundwater that has not been affected by leakage from an ISWLF.

f. The Department may require the owner or operator to submit a groundwater monitoring statistical analysis plan for review and approval. The statistical method chosen to evaluate groundwater monitoring data shall be appropriate for application to groundwater data, and shall be appropriate for the site specific distribution of chemical parameters and hazardous constituents.

16.54. DETECTION MONITORING PROGRAM

a. Detection monitoring is required at ISWLFs at all groundwater monitoring wells approved by the Department for routine monitoring.

(1) The Department will approve an appropriate list of groundwater monitoring parameters for routine monitoring based on the chemical and physical nature of the waste stream received by the ISWLF and analytical data for the waste stream provided by the owner and or operator.

(2) [Reserved]

b. The monitoring frequency for all constituents approved by the Department for routine monitoring shall be at least semiannual during the active life of the facility (including closure) and the post-closure period. At least one sample from each well (background and downgradient) must be collected and analyzed during each sampling event.

c. The Department may specify an appropriate alternative frequency for routine sampling and analysis during the active life (including closure) and the post-closure care period. The alternative frequency during the active life (including closure) shall be, at a minimum, semiannual. The alternative frequency shall be based on consideration of the following factors:

(1) Lithology of the aquifer and unsaturated zone;

(2) Hydraulic conductivity of the aquifer and unsaturated zone;

(3) Groundwater flow rates;

(4) Minimum distance between upgradient edge of the ISWLF and downgradient monitoring well screen (minimum distance of travel); and

(5) Resource value of the aquifer.

d. If the owner or operator determines that a groundwater protection standard has potentially been exceeded for one or more of the constituents required for routine monitoring at any monitoring well at the relevant point of compliance, the owner or operator:

(1) Shall, within fourteen (14) days of this finding, notify the Department which constituents have potentially exceeded groundwater standards;

(2) Shall, within thirty (30) days of this finding, resample the monitoring well(s) in question to determine the validity of the data, and report the results of this resampling within forty-five (45) days to the Department; and

(3) If the data are validated by resampling, shall establish an assessment monitoring program meeting the requirements of 16.55. except as provided for in paragraph 16.54.e. of this section.

e. The owner/operator may demonstrate that a source other than an ISWLF caused the exceedance of a groundwater protection standard or that its exceedance resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. A certified report documenting this demonstration must be approved by the Department. If a successful demonstration is made and documented, the owner or operator may continue detection monitoring as specified in this section. If, after ninety (90) days, a successful demonstration is not made, the owner or operator must initiate the assessment monitoring program as required in 16.55.

f. The results and supporting documentation of all chemical analysis of groundwater samples taken during routine monitoring shall be submitted to the Department within sixty (60) days of sample collection. On sampling events where an annual report is to be submitted to the Department pursuant to 16.54.g., the annual report shall satisfy this requirement.

g. The owner/operator shall submit to the Department on or before the anniversary date of issuance of the permit, an annual report containing all of the analytical and statistical analysis performed at the site for the previous year as a result of the requirements of this regulation. The annual report shall contain the following:

(1) A determination of the technical sufficiency of the monitoring well network in detecting a release from the facility;

(2) The determination of groundwater elevations, groundwater flow directions and groundwater flow rates. Groundwater flow directions shall be based upon interpretation of a potentiometric map prepared utilizing the most current groundwater elevations measured at the site;

(3) The results of the statistical analysis performed on the analytical data, as necessary;

(4) The results and supporting documentation of all chemical analysis of groundwater taken during the previous sampling event; and,

(5) Any other information related to environmental monitoring deemed necessary by the Department.

16.55. ASSESSMENT AND CORRECTIVE ACTION MONITORING PROGRAMS

a. Assessment monitoring is required whenever a groundwater protection standard has been exceeded in any point of compliance well and validated in accordance with section 16.54.d. for any of the parameters

required for routine monitoring, unless a successful demonstration has been made in accordance with section 16.54.e.

(1) The Department may require additional monitoring parameters or frequency during assessment or corrective action implementation to ensure protection of human health and the environment.

(2) [Reserved]

b. Within ninety (90) days of triggering an assessment monitoring program, the owner or operator shall submit for Department review and approval a groundwater quality assessment plan for characterizing the nature and extent of the release. The groundwater quality assessment plan shall contain a detailed schedule for the implementation and completion of the provisions of the plan.

c. Upon approval of the groundwater quality assessment plan, the owner or operator shall implement the provisions of the groundwater quality assessment plan and begin characterizing the nature and extent of the release by subsurface investigation as necessary. The groundwater quality assessment shall be completed in a timely manner as outlined in the plan. Data gathered from the groundwater quality assessment may be subject to a risk assessment.

d. Upon confirmation of exceedance of a groundwater protection standard, the owner or operator shall notify all persons who own land or reside on land that directly overlies any part of the plume of contamination if contaminants have migrated off-site as indicated by the sampling of groundwater monitoring wells.

e. Upon completion of the groundwater quality assessment, the owner or operator shall submit to the Department a corrective action plan detailing the actions to be taken to address groundwater quality, including any proposal for risk based criteria consistent with South Carolina DHEC R.61-68, Water Classifications and Standards, and a schedule for the initiation and completion of remedial activities. The schedule shall require the initiation and completion of the corrective action program within a reasonable time period as determined by technical factors.

(1) Corrective action remedies shall:

(a) Be protective of human health and the environment;

(b) Attain groundwater remediation levels approved by the Department;

(c) Control the source(s) of releases so as to reduce or eliminate, to the maximum extent practicable, further releases of constituents into the environment that may pose a threat to human health or the environment; and,

(d) Comply with all applicable standards for management of wastes.

(2) [Reserved]

f. The owner or operator shall implement the corrective action plan within ninety (90) days of approval by the Department. The corrective action plan shall also contain provisions for the installation of a groundwater monitoring program and network to demonstrate the effectiveness of the corrective action program.

g. The owner or operator shall continue the corrective action measures to the extent necessary to ensure that the groundwater remediation levels approved by the Department are not exceeded for a period of three (3) consecutive years. The Department may specify an alternative length of time during which the owner or operator must demonstrate that the concentrations have not exceeded the groundwater remediation levels

approved by the Department taking into consideration:

- (1) Extent and concentration of the release(s);
- (2) Behavior characteristics of the constituents in the groundwater;
- (3) Accuracy of monitoring or modeling techniques, including any seasonal, meteorological, or other environmental variabilities that may affect the accuracy; and
- (4) Characteristics of the groundwater.

h. The owner or operator shall submit semi-annually to the Department a report which discusses the effectiveness of the corrective action program.

i. If the owner or operator or the Department determines that the corrective action program no longer performs to design specifications or is ineffective in achieving the required results, the owner or operator shall submit within ninety (90) days of that determination, a proposal to make appropriate changes or revisions to the corrective action program.

j. Corrective action activities shall be continued, as necessary, throughout the active life of the facility and the post-closure period. If groundwater remediation levels approved by the Department are exceeded at the end of the post-closure care period, the owner or operator shall be responsible for maintaining the corrective action program to the extent necessary.

k. Upon approval by the Department that the corrective action program is completed, the owner or operator shall return to detection monitoring of the facility for the remainder of the active life and post-closure care period, unless additional groundwater quality assessment or corrective actions are required.

16.56. - 16.59 [Reserved]

SUBPART F -- CLOSURE AND POST-CLOSURE CARE

16.60. CLOSURE CRITERIA

a. Owners or operators of all Class 1, Class 2, and Class 3 ISWLFs must install a final cover system that is designed to minimize infiltration and erosion. The final cover system must be designed and constructed to:

(1) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less, and

(2) Minimize infiltration through the closed ISWLF by the use of an infiltration layer that contains a minimum eighteen (18) inches of earthen material, and

(3) Minimize erosion of the final cover by the use of an erosion layer that contains a minimum one (1) foot of earthen material that is capable of sustaining native plant growth.

b. The Department may approve an alternative final cover design for Class 1, Class 2, and Class 3 ISWLFs that includes:

(1) An infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs a.(1) and a.(2) of this section, and

(2) An erosion layer that provides equivalent protection from wind and water erosion as the erosion layer specified in a.(3) of this section.

c. The erosion layer shall be designed to maintain vegetative growth over the landfill.

d. All facilities constructed with composite liner systems in accordance with this regulation shall install a final cover system which consists, of at a minimum:

(1) A gas management layer or layers, or other gas management design, as necessary;

(2) Eighteen (18) inches of soil with a maximum permeability of 1×10^{-5} centimeters per second, and capable of providing a suitable foundation for the flexible membrane liner specified in 16.60.d.(3);

(3) A minimum 20-mil flexible membrane liner with a maximum permeability equal to or less than the bottom liner system, if HDPE is used as the FML, then a sixty (60) mil thickness is required;

(4) A drainage layer; and,

(5) A minimum of two (2) feet of soil capable of supporting native vegetation.

e. All ISWLFs closed utilizing a flexible membrane cover system shall be constructed to preclude precipitation migration into the landfill. All flexible membrane cover systems shall be constructed in accordance with the requirements of the approved engineering plans, reports, specifications and manufacturer's recommendations.

f. A written closure plan must be submitted to the Department that describes the steps necessary to close all ISWLFs at any point during their active life in accordance with the cover design requirements in sections 16.60.a., b., d., or e., as applicable. The closure plan, at a minimum, must include the following information:

(1) A description of the final cover, designed in accordance with section 16.60. and the methods and procedures to be used to install the cover;

(2) An estimate of the largest area of the ISWLF ever requiring a final cover as required under section 16.60. at any time during the active life;

(3) An estimate of the maximum inventory of wastes ever on-site over the active life of the landfill facility; and

(4) A schedule for completing all activities necessary to satisfy the closure criteria in section 16.60.

g. A closure plan must be submitted to the Department within one hundred eighty (180) days of the effective date of this regulation, or prior to permit issuance, whichever is later. The closure plan must be updated if any changes occur at the facility which require a deviation from the approved closure plan. The closure plan must be submitted by, signed, and stamped by a professional engineer duly licenced to practice in the State of South Carolina. All individual drawings and plans shall be signed and stamped separately by the professional engineer.

h. Prior to beginning closure of each ISWLF as specified in section 16.60.j., an owner or operator must notify the Department that a notice of the intent to close the ISWLF has been placed in the operating record.

i. The owner or operator must begin closure activities of each ISWLF no later than thirty (30) days after the date on which the ISWLF receives the known final receipt of wastes or, if the ISWLF has remaining capacity and there is a reasonable likelihood that the ISWLF will receive additional wastes, no later than one year after the most recent receipt of wastes. Extensions beyond the one-year deadline for beginning closure may be granted by the Department if the owner or operator demonstrates that the ISWLF has the capacity to receive additional wastes and the owner or operator has taken and will continue to take all steps necessary to prevent threats to human health and the environment from the unclosed ISWLF.

j. The owner or operator of all ISWLFs shall complete closure activities of each ISWLF in accordance with the closure plan within one hundred eighty (180) days following the beginning of closure as specified in section 16.60.i. Extensions of the closure period may be granted by the Department if the owner or operator demonstrates that closure will, of necessity, take longer than one hundred eighty (180) days and they have taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed ISWLF.

k. Following closure of each ISWLF, the owner or operator must notify the Department that a certification, signed by a South Carolina registered professional engineer, verifying that closure has been completed in accordance with the closure plan, has been placed in the operating record.

l. Following closure of all ISWLFs, the owner or operator must record a notation on the deed to the landfill facility property, or some other instrument that is normally examined during title search, and notify the Department that the notation has been recorded and a copy has been placed in the operating record.

(1) The notation on the deed must in perpetuity notify any potential purchaser of the property that:

(a) The land has been used as a landfill facility; and

(b) Its use is restricted under section 16.61.c.(3).

(2) [Reserved]

m. The owner or operator may request permission from the Department to remove the notation from the deed if all wastes are removed from the facility.

n. The Department may, on a case by case basis, approve other landfill closure designs, provided there is adequate information to demonstrate that the proposed design meets or exceeds the environmental and public health protection standards outlined in Subparts B, C, D and E of this regulation.

16.61. POST-CLOSURE CARE REQUIREMENTS

a. Following closure of each ISWLF, the owner or operator must conduct post-closure care. Post-closure care must be conducted for a minimum thirty (30) years, except as provided under paragraph b. of this section, and consist of at least the following:

(1) Maintaining the integrity and effectiveness of any final cover, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover;

(2) Maintaining and operating the leachate collection system in accordance with the requirements in sections 16.41. or 16.42., if applicable. The Department may allow the owner or operator to stop managing leachate if the owner or operator demonstrates to the Department=s satisfaction that leachate no longer poses

a threat to human health and the environment;

(3) Monitoring the groundwater in accordance with the requirements of subpart E of this part and maintaining the groundwater monitoring system, if applicable; and

(4) Maintaining and operating the gas monitoring system in accordance with the requirements of section 16.23.

b. The length of the post-closure care period may be:

(1) Increased by the Department if the Department determines that the lengthened period is necessary to protect human health and the environment.

(2) Decreased by the Department if the owner or operator can provide technical rationale that the decreased post-closure monitoring period is sufficient to protect human health and the environment.

c. A written post-closure plan must be submitted to the Department that includes, at a minimum, the following information:

(1) A description of the monitoring and maintenance activities required in section 16.61.(a) for each ISWLF, and the frequency at which these activities will be performed;

(2) Name, address, and telephone number of the person or office to contact about the facility during the post-closure period; and

(3) A description of the planned uses of the property during the post-closure period. Post-closure use of the property shall not disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the monitoring systems unless necessary to comply with the requirements in Part 16. The Department may approve any other disturbance of the containment system if the owner or operator demonstrates that disturbance of the final cover, liner or other component of the containment system, including any removal of waste, will not increase the potential threat to human health or the environment.

d. A post-closure plan must be submitted to the Department within one hundred eighty (180) days of the effective date of this regulation, or prior to permit issuance, whichever is later. The post-closure plan must be updated if any changes occur at the facility which require a deviation from the approved post-closure plan. The post-closure plan must be submitted by, signed, and stamped by a professional engineer duly licensed to practice in the State of South Carolina. All individual, drawings and plans must be signed and stamped separately by the professional engineer.

e. Following completion of the post-closure care period for each ISWLF, the owner or operator must notify the Department that a certification, signed by a South Carolina registered professional engineer, verifying that post-closure care has been completed in accordance with the post-closure plan, has been placed in the operating record. At the end of the post-closure care period the Department will inspect the completed ISWLF.

16.62. - 16.69. [Reserved]

SUBPART G -- FINANCIAL ASSURANCE CRITERIA

16.70. APPLICABILITY AND EFFECTIVE DATE

a. The requirements of this subpart apply to owners and operators of all commercial ISWLFs, except owners or operators who are State or Federal government entities whose debts and liabilities are the debts and liabilities of a State or the United States.

b. The requirements of this subpart become effective one hundred eighty (180) days after the effective date of this regulation.

16.71. FINANCIAL ASSURANCE FOR CLOSURE

a. The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party to close the largest area of the ISWLF ever requiring a final cover as required under section 16.60 at any time during the active life in accordance with the closure plan. The owner or operator must notify the Department that the estimate has been placed in the operating record.

(1) The cost estimate must equal the cost of closing the largest area of the ISWLF ever requiring a final cover at any time during the active life when the extent and manner of its operation would make closure the most expensive, as indicated by its closure plan (see section 16.60.c.(2) of this part).

(2) During the active life of the ISWLF, the owner or operator must annually adjust the closure cost estimate for inflation.

(3) The owner or operator must increase the closure cost estimate and the amount of financial assurance provided under paragraph b. of this section if changes to the closure plan or ISWLF conditions increase the maximum cost of closure at any time during the remaining active life.

(4) The owner or operator may reduce the closure cost estimate and the amount of financial assurance provided under paragraph b. of this section if the cost estimate exceeds the maximum cost of closure at any time during the remaining life of the ISWLF. The owner or operator must notify the Department that the justification for the reduction of the closure cost estimate and the amount of financial assurance has been placed in the operating record.

b. The owner or operator of each ISWLF must establish financial assurance for closure of the ISWLF in compliance with section 16.74. The owner or operator must provide continuous coverage for closure until released from financial assurance requirements by demonstrating compliance with sections 16.60.h. and i.

16.72. FINANCIAL ASSURANCE FOR POST-CLOSURE CARE

a. The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party to conduct post-closure care for the ISWLF in compliance with the post-closure plan developed under section 16.61. of this part. The post-closure cost estimate used to demonstrate financial assurance in paragraph b. of this section must account for the total costs of conducting post-closure care, including annual and periodic costs as described in the post-closure plan over the entire post-closure care period. The owner or operator must notify the Department that the estimate has been placed in the operating record.

(1) The cost estimate for post-closure care must be based on the most expensive costs of post-closure care during the post-closure care period.

(2) During the active life of the ISWLF and during the post-closure care period, the owner or operator must annually adjust the post-closure cost estimate for inflation.

(3) The owner or operator must increase the post-closure care cost estimate and the amount of financial assurance provided under paragraph b. of this section if changes in the post-closure plan or ISWLF conditions increase the maximum costs of post-closure care.

(4) The owner or operator may reduce the post-closure cost estimate and the amount of financial assurance provided under paragraph b. of this section if the cost estimate exceeds the maximum costs of post-closure care remaining over the post-closure care period. The owner or operator must notify the Department that the justification for the reduction of the post-closure cost estimate and the amount of financial assurance has been placed in the operating record.

b. The owner or operator of each ISWLF must establish, in a manner in accordance with section 16.74., financial assurance for the costs of post-closure care as required under section 16.61. of this part. The owner or operator must provide continuous coverage for post-closure care until released from financial assurance requirements for post-closure care by demonstrating compliance with section 16.61.e.

16.73. FINANCIAL ASSURANCE FOR CORRECTIVE ACTION

a. An owner or operator of an ISWLF required to undertake a corrective action program under section 16.55. of this part must have a detailed written estimate, in current dollars, of the cost of hiring a third party to perform the corrective action in accordance with the program required under section 16.55. of this part. 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 notify the Department that the estimate has been placed in the operating record.

(1) The owner or operator must annually adjust the estimate for inflation until the corrective action program is completed in accordance with section 16.55. of this part.

(2) The owner or operator must increase the corrective action cost estimate and the amount of financial assurance provided under paragraph b. of this section if changes in the corrective action program or ISWLF conditions increase the maximum costs of corrective action.

(3) The owner or operator may reduce the amount of the corrective action cost estimate and the amount of financial assurance provided under paragraph b. of this section if the cost estimate exceeds the maximum remaining costs of corrective action. The owner or operator must notify the Department that the justification for the reduction of the corrective action cost estimate and the amount of financial assurance has been placed in the operating record.

b. The owner or operator of each ISWLF required to undertake a corrective action program under section 16.55. of this part must establish, in a manner in accordance with section 16.74., financial assurance for the most recent corrective action program. The owner or operator must provide continuous coverage for corrective action until released from financial assurance requirements for corrective action by demonstrating compliance with section 16.55.

16.74. ALLOWABLE MECHANISMS

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 and operators must choose from the options specified in paragraphs a. through j. of this section.

a. Trust Fund.

(1) An owner or operator may satisfy the requirements of this section by establishing a trust fund which conforms to the requirements of this paragraph. 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 agency. A copy of the trust agreement must be placed in the facility's operating record.

(2) Payments into the trust fund must be made annually by the owner or operator over the term of the initial permit or over the remaining life of the ISWLF, whichever is shorter, in the case of a trust fund for closure or post-closure care, or over one-half of the estimated length of the corrective action program in the case of corrective action for known releases. This period is referred to as the pay-in period.

(3) For a trust fund used to demonstrate financial assurance for closure and post-closure care, the first payment into the fund must be at least equal to the current cost estimate for closure or post-closure care, except as provided in paragraph (j) of this section, divided by the number of years in the pay-in period as defined in paragraph (a)(2) of this section. The amount of subsequent payments must be determined by the following formula:

$$\text{Next Payment} = \frac{\text{CE}-\text{CV}}{\text{Y}}$$

where CE is the current cost estimate for closure or post-closure care (updated for inflation or other changes), CV is the current value of the trust fund, and Y is the number of years remaining in the pay-in period.

(4) For a trust fund used to demonstrate financial assurance for corrective action, the first payment into the trust fund must be at least equal to one-half of the current cost estimate for corrective action, except as provided in paragraph j. of this section, divided by the number of years in the corrective action pay-in period as defined in paragraph a.(2) of this section. The amount of subsequent payments must be determined by the following formula:

$$\text{Next Payment} = \frac{\text{RB}-\text{CV}}{\text{Y}}$$

where RB is the most recent estimate of the required trust fund balance for corrective action (i.e., the total costs that will be incurred during the second half of the corrective action period), CV is the current value of the trust fund, and Y is the number of years remaining on the pay-in period.

(5) The initial payment into the trust fund must be made before the initial receipt of waste or before the effective date of this section, whichever is later, in the case of closure and post-closure care.

(6) If the owner or operator establishes a trust fund after having used one or more alternate mechanisms specified in this section, the initial payment into the trust fund must be at least the amount that the fund would contain if the trust fund were established initially and annual payments made according to the specifications of this paragraph and section 16.74.a., as applicable.

(7) The owner or operator, or other person authorized to conduct closure, post-closure care, or corrective action activities may request reimbursement from the trustee for these expenditures. Requests for reimbursement will be granted by the trustee only if sufficient funds are remaining in the trust fund to cover the remaining costs of closure, post-closure care, or corrective action, and if justification and documentation of the cost is placed in the operating record. The owner or operator must notify the Department that the documentation of the justification for reimbursement has been placed in the operating record and that reimbursement has been received.

(8) The trust fund may be terminated by the owner or operator only if the owner or operator substitutes alternate financial assurance as specified in this section or if he is no longer required to demonstrate financial responsibility in accordance with the requirements of sections 16.71.b. or 16.72.b.

b. Surety Bond Guaranteeing Payment or Performance.

(1) An owner or operator may demonstrate financial assurance for closure or post-closure care by obtaining a payment or performance surety bond which conforms to the requirements of this paragraph. An owner or operator may demonstrate financial assurance for corrective action by obtaining a performance bond which conforms to the requirements of this paragraph. The bond must be effective before the initial receipt of waste or before the effective date of this section, whichever is later, in the case of closure and post-closure care. The owner or operator must notify the Department that a copy of the bond has been placed in the operating record. The surety company issuing the bond must, at a minimum, be among those listed as acceptable sureties on Federal bonds in Circular 570 of the U.S. Department of the Treasury.

(2) The penal sum of the bond must be in an amount at least equal to the current closure, post-closure care or corrective action cost estimate, whichever is applicable, except as provided in 16.74.k.

(3) Under the terms of the bond, the surety will become liable on the bond obligation when the owner or operator fails to perform as guaranteed by the bond.

(4) The owner or operator must establish a standby trust fund. The standby trust fund must meet the requirements of section 16.74.a. except the requirements for initial payment and subsequent annual payments specified in sections 16.74.a.(2), (3), (4) and (5).

(5) Payments made under the terms of the bond will be deposited by the surety directly into the standby trust fund. Payments from the trust fund must be approved by the trustee.

(6) Under the terms of the bond, the surety may cancel the bond by sending notice of cancellation by certified mail to the owner and operator and to the Department one hundred twenty (120) days in advance of cancellation. If the surety cancels the bond, the owner or operator must obtain alternate financial assurance as specified in this section.

(7) The owner or operator may cancel the bond only if alternate financial assurance is substituted as specified in this section or if the owner or operator is no longer required to demonstrate financial responsibility in accordance with sections 16.71.b. or 16.72.b.

c. Letter of Credit.

(1) An owner or operator may satisfy the requirements of this section by obtaining an irrevocable standby letter of credit which conforms to the requirements of this paragraph. The letter of credit must be effective before the initial receipt of waste or before the effective date of this section, whichever is later, in the case of closure and post-closure care. The owner or operator must notify the Department that a copy of the letter of credit has been placed in the operating record. The issuing 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 agency.

(2) A letter from the owner or operator referring to the letter of credit by number, issuing institution, and date, and providing the following information: name, and address of the facility, and the amount of funds assured, must be included with the letter of credit in the operating record.

(3) The letter of credit must be irrevocable and issued for a period of at least one (1) year in an amount at least equal to the current cost estimate for closure, post-closure care or corrective action, whichever is applicable, except as provided in section 16.74.a. The letter of credit must provide that the expiration date will be automatically extended for a period of at least one year unless the issuing institution has canceled the letter of credit by sending notice of cancellation by certified mail to the owner and operator and to the Department one hundred twenty (120) days in advance of cancellation. If the letter of credit is canceled by the issuing institution, the owner or operator must obtain alternate financial assurance.

(4) The owner or operator may cancel the letter of credit only if alternate financial assurance is substituted as specified in this section or if the owner or operator is released from the requirements of this section in accordance with sections 16.71.b. or 16.72.b.

d. Insurance.

(1) An owner or operator may demonstrate financial assurance for closure and post-closure care by obtaining insurance which conforms to the requirements of this paragraph. The insurance must be effective before the initial receipt of waste or before the effective date of this section, whichever is later. At a minimum, the insurer must be licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States. The owner or operator must notify the Department that a copy of the insurance policy has been placed in the operating record.

(2) The closure or post-closure care insurance policy must guarantee that funds will be available to close the ISWLF whenever final closure occurs or to provide post-closure care for the ISWLF whenever the post-closure care period begins, whichever is applicable. The policy must also guarantee that once closure or post-closure care begins, the insurer will be responsible for the paying out of funds to the owner or operator or other person authorized to conduct closure or post-closure care, up to an amount equal to the face amount of the policy.

(3) The insurance policy must be issued for a face amount at least equal to the current cost estimate for closure or post-closure care, whichever is applicable, except as provided in section 16.74.a. The term "face amount" means the total amount the insurer is obligated to pay under the policy. Actual payments by the insurer will not change the face amount, although the insurer's future liability will be lowered by the amount of the payments.

(4) An owner or operator, or any other person authorized to conduct closure or post-closure care, may receive reimbursements for closure or post-closure expenditures, whichever is applicable. Requests for reimbursement will be granted by the insurer only if the remaining value of the policy is sufficient to cover the remaining costs of closure or post-closure care, and if justification and documentation of the cost is placed in the operating record. The owner or operator must notify the Department that the documentation of the justification for reimbursement has been placed in the operating record and that reimbursement has been received.

(5) Each policy must contain a provision allowing assignment of the policy to a successor owner or operator. Such assignment may be conditional upon consent of the insurer, provided that such consent is not unreasonably refused.

(6) The insurance 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. If there is a failure to pay the premium, the insurer may cancel the policy by sending notice of cancellation by certified mail to the

owner and operator and to the Department one hundred twenty (120) days in advance of cancellation. If the insurer cancels the policy, the owner or operator must obtain alternate financial assurance as specified in this section.

(7) For insurance policies providing coverage for post-closure care, commencing on the date that liability to make payments pursuant to the policy accrues, the insurer will thereafter annually increase the face amount of the policy. Such increase must be equivalent to the face amount of the policy, less any payments made, multiplied by an amount equivalent to eighty-five (85) percent of the most recent investment rate or of the equivalent coupon-issue yield announced by the U.S. Treasury for 26-week Treasury securities.

(8) The owner or operator may cancel the insurance policy only if alternate financial assurance is substituted as specified in this section or if the owner or operator is no longer required to demonstrate financial responsibility in accordance with the requirements of sections 16.71.b. or 16.72.b.

e. Corporate Financial Test.

[reserved]

f. Local Government Financial Test. An owner or operator that satisfies the requirements of paragraphs f.(1) through (3) of this section may demonstrate financial assurance up to the amount specified in paragraph f.(4) of this section:

(1) Financial component.

(a) The owner or operator must satisfy paragraph f.(1)(a)(i) or (ii) of this section as applicable:

(i) If the owner or operator 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

(ii) The owner or operator must satisfy each of the following financial ratios based on the owner or operator's most recent audited annual financial statement:

(aa) A ratio of cash plus marketable securities to total expenditures greater than or equal to 0.05;
and

(bb) A ratio of annual debt service to total expenditures less than or equal to 0.20.

(b) The owner or operator must prepare its financial statements in conformity with Generally Accepted Accounting Principles for governments and have its financial statements audited by an independent certified public accountant (or appropriate State agency).

(c) A local government is not eligible to assure its obligations under section 16.74.f. if it:

(i) Is currently in default on any outstanding general obligation bonds; or

(ii) Has any outstanding general obligation bonds rated lower than Baa as issued by Moody's or BBB as issued by Standard and Poor's; or

(iii) Operated at a deficit equal to five percent or more of total annual revenue in each of the past two fiscal years; or

(iv) Receives an adverse opinion, disclaimer of opinion, or other qualified opinion from the independent certified public accountant (or appropriate State agency) auditing its financial statement as required under paragraph f.(1)(b) of this section. However, the Department may evaluate qualified opinions on a case-by-case basis and allow use of the financial test in cases where the Department deems the qualification insufficient to warrant disallowance of use of the test.

(d) The following terms used in this paragraph are defined as follows:

(i) Deficit equals total annual revenues minus total annual expenditures;

(ii) Total revenues include revenues from all taxes and fees but does not include the proceeds from borrowing or asset sales, excluding revenue from funds managed by local government on behalf of a specific third party;

(iii) Total expenditures include all expenditures excluding capital outlays and debt repayment;

(iv) Cash plus marketable securities is all the cash plus marketable securities held by the local government on the last day of a fiscal year, excluding cash and marketable securities designated to satisfy past obligations such as pensions; and

(v) Debt service is the amount of principal and interest due on a loan in a given time period, typically the current year.

(2) Public notice component. The local government owner or operator must place a reference to the closure and post-closure care costs assured through the financial test into its next comprehensive annual financial report (CAFR) after the effective date of this section or prior to the initial receipt of waste at the facility, whichever is later. Disclosure must include the nature and source of closure and post-closure care requirements, the reported liability at the balance sheet date, the estimated total closure and post-closure care cost remaining to be recognized, the percentage of landfill capacity used to date, and the estimated landfill life in years. A reference to corrective action costs must be placed in the CAFR not later than one hundred twenty (120) days after the corrective action remedy has been selected in accordance with the requirements of section 16.58. For the first year the financial test is used to assure costs at a particular facility, the reference may instead be placed in the operating record until issuance of the next available CAFR if timing does not permit the reference to be incorporated into the most recently issued CAFR or budget. For closure and post-closure costs, conformance with Government Accounting Standards Board Statement 18 assures compliance with this public notice component.

(3) Recordkeeping and reporting requirements.

(a) The local government owner or operator must place the following items in the facility's operating record:

(i) A letter signed by the local government's chief financial officer that:

(aa) Lists all the current cost estimates covered by a financial test, as described in paragraph f.(4) of this section;

(bb) Provides evidence and certifies that the local government meets the conditions of

paragraphs f.(1)(a), f.(1)(b), and f.(1)(3) of this section; and

(cc) Certifies that the local government meets the conditions of paragraphs f.(2) and f.(4) of this section.

(ii) The local government's independently audited year-end financial statements for the latest fiscal year (except for local governments where audits are required every two years where unaudited statements may be used in years when audits are not required), including the unqualified opinion of the auditor who must be an independent, certified public accountant or an appropriate State agency that conducts equivalent comprehensive audits;

(iii) A report to the local government from the local government's independent certified public accountant (CPA) or the appropriate State agency based on performing an agreed upon procedures engagement relative to the financial ratios required by paragraph f.(1)(a)(ii) of this section, if applicable, and the requirements of paragraphs f.(1)(b) and f.(1)(c) (iii) and (iv) of this section. The CPA or State agency's report should state the procedures performed and the CPA or State agency's findings; and

(iv) A copy of the comprehensive annual financial report (CAFR) used to comply with paragraph f.(2) of this section or certification that the requirements of General Accounting Standards Board Statement 18 have been met.

(b) The items required in paragraph f.(3)(a) of this section must be placed in the facility operating record as follows:

(i) In the case of closure and post-closure care, either before the effective date of this section, which is April 9, 1997, or prior to the initial receipt of waste at the facility, whichever is later, or

(ii) In the case of corrective action, not later than 120 days after the corrective action remedy is approved by the Department.

(c) After the initial placement of the items in the facility's operating record, the local government owner or operator must update the information and place the updated information in the operating record within 180 days following the close of the owner or operator's fiscal year.

(d) The local government owner or operator is no longer required to meet the requirements of paragraph f.(3) of this section when:

(i) The owner or operator substitutes alternate financial assurance as specified in this section; or

(ii) The owner or operator is released from the requirements of this section in accordance with sections 16.71.b., 16.72.b., or 16.73.b.

(e) A local government must satisfy the requirements of the financial test at the close of each fiscal year. If the local government owner or operator no longer meets the requirements of the local government financial test it must, within two hundred ten (210) days following the close of the owner or operator's fiscal year, obtain alternative financial assurance that meets the requirements of this section, place the required submissions for that assurance in the operating record, and notify the Department that the owner or operator no longer meets the criteria of the financial test and that alternate assurance has been obtained.

(f) The Department, based on a reasonable belief that the local government owner or operator may no longer meet the requirements of the local government financial test, may require additional reports of

financial condition from the local government at any time. If the Department finds, on the basis of such reports or other information, that the owner or operator no longer meets the requirements of the local government financial test, the local government must provide alternate financial assurance in accordance with this section.

(4) Calculation of Costs to be Assured. The portion of the closure, post-closure, and corrective action costs for which an owner or operator can assure under this paragraph is determined as follows:

(a) If the local government owner or operator does not assure other environmental obligations through a financial test, it may assure closure, post-closure, and corrective action costs that equal up to 43 percent of the local government's total annual revenue.

(b) If the local government assures other environmental obligations through a financial test, including those associated with UIC facilities under 40 CFR 144.62, petroleum 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, post-closure, and corrective action costs it seeks to assure under this paragraph. The total that may be assured must not exceed forty three (43) percent of the local government's total annual revenue.

(c) The owner or operator must obtain an alternate financial assurance instrument for those costs that exceed the limits set in paragraphs f.(4) (a) and (b) of this section.

g. Corporate Guarantee.

[Reserved]

h. Local Government Guarantee. An owner or operator may demonstrate financial assurance for closure, post-closure, and corrective action, as required by Sections 16.71, 16.72, and 16.73, by obtaining a written guarantee provided by a local government. The guarantor must meet the requirements of the local government financial test in paragraph f. of this section, and must comply with the terms of a written guarantee.

(1) Terms of the written guarantee. The guarantee must be effective before the initial receipt of waste or before the effective date of this section, whichever is later, in the case of closure, post-closure care, or no later than one hundred twenty (120) days after the corrective action remedy has been approved by the Department. The guarantee must provide that:

(a) If the owner or operator fails to perform closure, post-closure care, and/or corrective action of a facility covered by the guarantee, the guarantor will:

(i) Perform, or pay a third party to perform, closure, post-closure care, and/or corrective action as required; or

(ii) Establish a fully funded trust fund as specified in paragraph (a) of this section in the name of the owner or operator.

(b) The guarantee will remain in force unless the guarantor sends notice of cancellation by certified mail to the owner or operator and to the Department. Cancellation may not occur, however, during the one hundred twenty (120) days beginning on the date of receipt of the notice of cancellation by both the owner or operator and the Department, as evidenced by the return receipts.

(c) If a guarantee is canceled, the owner or operator must, within ninety (90) days following receipt of

the cancellation notice by the owner or operator and the Department, obtain alternate financial assurance, place evidence of that alternate financial assurance in the facility operating record, and notify the Department. If the owner or operator fails to provide alternate financial assurance within the ninety (90) day period, the guarantor must provide that alternate assurance within one hundred twenty (120) days following the guarantor's notice of cancellation, place evidence of the alternate assurance in the facility operating record, and notify the Department.

(2) Recordkeeping and reporting.

(a) The owner or operator must place a certified copy of the guarantee along with the items required under paragraph f.(3) of this section into the facility's operating record before the initial receipt of waste or before the effective date of this section, whichever is later, in the case of closure, post-closure care, or no later than one hundred twenty (120) days after the corrective action remedy has been approved by the Department.

(b) The owner or operator is no longer required to maintain the items specified in paragraph h.(2) of this section when:

(i) The owner or operator substitutes alternate financial assurance as specified in this section; or

(ii) The owner or operator is released from the requirements of this section in accordance with sections 16.71.b., 16.72.b., or 16.73.b.

(c) If a local government guarantor no longer meets the requirements of paragraph (f) of this section, the owner or operator must, within ninety (90) days, obtain alternative assurance, place evidence of the alternate assurance in the facility operating record, and notify the Department. If the owner or operator fails to obtain alternate financial assurance within that ninety (90) day period, the guarantor must provide that alternate assurance within the next thirty (30) days.

i. State Approved Mechanism. An owner or operator may satisfy the requirements of this section by obtaining any other mechanism that meets the criteria specified in section 16.74.l., and that is approved by the Department.

j. State Assumption of Responsibility. If the State Director either assumes legal responsibility for an owner or operator's compliance with the closure, post-closure care and/or corrective action requirements of this part, or assures that the funds will be available from State sources to cover the requirements, the owner or operator will be in compliance with the requirements of this section. Any State assumption of responsibility must meet the criteria specified in section 16.74.l.

k. Use of Multiple Financial Mechanisms. An owner or operator may satisfy the requirements of this section by establishing more than one financial mechanism per facility or for multiple facilities. The mechanisms must be as specified in paragraphs a., b., c., d., e., f., g., h., i. and j. of this section, except that it is the combination of mechanisms, rather than the single mechanism, which must provide financial assurance for an amount at least equal to the current cost estimate for closure, post-closure care or corrective action, whichever is applicable. The financial test and a guarantee provided by a corporate parent, sibling, or grandparent may not be combined if the financial statements of the two firms are consolidated.

l. The language of the mechanisms listed in paragraphs a., b., c., d., e., f., g., h., i. and j. of this section must ensure that the instruments satisfy the following criteria:

(1) The financial assurance mechanisms 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;

(2) The financial assurance mechanisms must ensure that funds will be available in a timely fashion when needed;

(3) The financial assurance mechanisms must be obtained by the owner or operator by the effective date of these requirements or prior to the initial receipt of industrial solid waste, whichever is later, in the case of closure and post-closure care, until the owner or operator is released from the financial assurance requirements under sections 16.71. and 16.72.

(4) The financial assurance mechanisms must be legally valid, binding, and enforceable under State and Federal law.

16.75. DISCOUNTING

a. The Department may allow discounting of closure cost estimates in section 16.71.a., post-closure cost estimates in section 16.72.a., and/or corrective action cost estimates in section 16.73.a. up to the rate of return for essentially risk free investments, net of inflation, under the following conditions:

(1) The Department determines that the cost estimates are complete and accurate and the owner or operator has submitted a statement from a Registered Professional Engineer so stating;

(2) The Department finds the facility in compliance with applicable and appropriate permit conditions;

(3) The Department determines that the closure date is certain and the owner or operator certifies that there are no foreseeable factors that will change the estimate of site life; and

(4) Discounted cost estimates must be adjusted annually to reflect inflation and years of remaining life.

b. [Reserved]

16.76 - 16.79 [Reserved]

SUBPART H

16.80. PERMIT APPLICATION REQUIREMENTS

a. Applications for a permit to construct and operate a new ISWLF shall contain at a minimum the following:

(1) A Landfill Location Restriction Study as outlined in section 16.81.

(2) A Disclosure Statement for commercial ISWLFs.

(3) A document demonstrating compliance with applicable Solid Waste Management Plans for commercial ISWLFs.

b. Upon receipt of written notice from the Department to the applicant that the issues contained in section 16.80.a. have been satisfactorily addressed, and the site is determined to be suitable for the intended purpose, the following information shall be submitted by, signed, and stamped by a professional engineer duly licensed to practice in the State of South Carolina. All individual drawings and plans shall be signed and stamped separately by the professional engineer.

- (1) A completed Permit Application Form.
- (2) Engineering Drawings that set forth the proposed landfill location, property boundaries, adjacent land uses and construction details.
- (3) Operation Plans that describe how the landfill will fulfill the requirements of protecting human health and the environment.
- (4) A Landscape Plan prepared to address adequate seeding or screening of the site.
- (5) An Engineering Report comprehensively describing the existing site conditions and an analysis of the landfill, including closure and post-closure criteria.
- (6) A Quality Assurance/Quality Control Report prepared in accordance with all standardly accepted QA/QC practices.
- (7) An Operation and Maintenance Report prepared to demonstrate how the landfill will meet all the operational requirements.
- (8) A Contingency Plan.
- (9) A Groundwater Monitoring Plan.
- (10) A Closure Plan.
- (11) A Post-Closure Care Plan.

16.81. LANDFILL LOCATION RESTRICTION STUDY

- a. The landfill location restriction study for a new Class 1 ISWLF which disposes of only those wastes listed in Appendix 1, or other approved wastes, shall ensure that the proposed landfill location complies with section 16.11., section 16.12., and applicable portions of section 16.18. of this regulation.
- b. All other new Class 1, Class 2, and Class 3 ISWLF applications shall contain a landfill location restriction study, which shall include at a minimum, a discussion of compliance with sections 16.11., 16.12., 16.13., 16.14., 16.15., and applicable portions of section 16.18. The study shall be used to eliminate those sites which, due to location restrictions, are unsuitable sites and to determine if site conditions warrant further permitting activities.

16.82. DISCLOSURE STATEMENT

- a. Upon notification of the Department of the intent to site a commercial ISWLF, the applicant shall submit a disclosure statement as outlined in the Solid Waste Policy and Management Act, S.C. Code Ann. (1976 Code as amended) section 44-96-300. The Department may accept one disclosure statement for multiple facility permit applicants. This section shall not apply if the applicant is a local government or a region comprised of local governments. The disclosure statement shall contain the following information with regard to the applicant and his responsible parties:

- (1) The full name, business address, and social security number of all responsible parties;

(2) A description of the experience and credentials, including any past or present permits or licenses for the collection, transportation, treatment, storage, or disposal of industrial solid waste issued to or held by the applicant within the past five (5) years;

(3) A listing and explanation of all convictions by final judgement of a responsible party in a state or federal court, whether under appeal or not, of a crime of moral turpitude punishable by a fine of five thousand dollars (\$5,000.00) or more or imprisonment for one year or more, or both, within five (5) years immediately preceding the date of the submission of the permit application.

(4) A listing and explanation of all convictions by final judgement of a responsible party in a state or federal court, whether under appeal or not, of a criminal or civil offense involving a violation of an environmental law punishable by a fine of five thousand dollars (\$5,000.00) or more or imprisonment for one year or more, or both, in a state or federal court within five (5) years of the date of submission of the permit application;

(5) A listing and explanation of the instances in which a disposal facility permit held by the applicant was revoked by final judgement in a state or federal court, whether under appeal or not, within five (5) years of the date of submission of the permit application; and

(6) A listing and explanation of all adjudications of the applicant for having been in contempt of any valid court order enforcing any federal environmental law or any state environmental law relative to the activity for which the permit is being sought, within five (5) years of the date of submission of the permit application.

16.83. COMPLIANCE WITH SOLID WASTE MANAGEMENT PLANS

a. The permit applicant for a commercial ISWLF shall demonstrate compliance with the State Solid Waste Management Plan in effect at the time of submittal of the demonstration to the Department.

b. The permit applicant for a commercial ISWLF shall demonstrate compliance with the County or Regional Solid Waste Management Plan in effect at the time of submittal of the demonstration to the Department.

c. All landfills shall adhere to all Federal and State rules and regulations, and all local zoning, land use and other applicable local ordinances.

16.84. PERMIT APPLICATION FORM

a. The permit applicant shall submit a completed permit application, on a form provided by the Department, as a part of the permit application requirements specified in section 16.80. The permit application form may not require any information not specifically required by these regulations.

16.85. [Reserved]

16.86. ENGINEERING DRAWINGS

a. All applications for new ISWLF facilities shall contain engineering drawings consisting of the following:

(1) A vicinity plan or map that must show the area within one mile of the property boundaries of the landfill in terms of: the existing and proposed zoning and land uses within that area at the time of permit

application; and residences, public and private water supply wells, known aquifers, and surface waters (with quality classifications), access roads, bridges, railroads, airports, historic sites, and other existing and proposed man-made or natural features relating to the facility. The drawings must be to scale.

(2) Site plans that must show: the landfill's property boundaries, as certified by an individual licensed to practice land surveying in the State of South Carolina, off-site and on-site utilities (such as, electric, gas, water, storm, and sanitary sewer systems) and right-of-ways, easements; the names and addresses of abutting property owners; the location of soil borings, excavations, test pits, gas venting structures, wells, piezometers, environmental and facility monitoring points and devices, (with each identified with a permanent marking system, and horizontal and vertical location shown, as measured from the ground surface and top of well casing), benchmarks and permanent survey markers, and on-site buildings and appurtenances, fences, gates, roads, parking areas, drainage culverts, and signs; the delineation of the total landfill area including planned staged development of the landfill's construction and operation, and the lateral limits of any previously filled areas; the location and identification of the sources of cover materials; the location and identification of special waste handling areas; and site topography with five (5) feet minimum contour intervals, and any other relevant information as necessary for proper operation. The site plan drawings must show wetlands, property lines, existing wells, water bodies, residences, schools, or any building on adjoining property.

(3) Detailed plans of the landfill must clearly show in plan and cross sectional views the following: the original, undeveloped site topography before excavation or placement of industrial solid waste; the existing site topography, if different, including the location and approximate thickness and nature of any existing industrial solid waste; the high groundwater table; the proposed limits of excavation and waste placement; other devices as needed to divert or collect surface water run-on or run-off; the final elevations and grades of the landfill; groundwater monitoring; sedimentation ponds and any treatment, pre-treatment, or storage facilities; roadway sections, dimensions, slopes and profile; the building locations and appurtenances.

b. Applications for new Class 2 and Class 3 ISWLFs shall also show the location and placement of each liner system and of each leachate collection system; location and showing of all critical grades and elevations of the collection pipe inverts and drainage envelopes, manholes, cleanouts, valves, and sumps; leachate storage, treatment and disposal systems including the collection network and any treatment, pre-treatment or storage facilities.

16.87. OPERATIONAL PLAN

a. The operational plan shall be presented in a manner sufficiently clear and comprehensive for use by the landfill's operator during the life of the landfill; and depict in plan and cross-sectional views the fill progression with respect to site life; and contain:

(1) A description of the site's preparation and fill progression for the life of the site in terms of method, depth, location and sequence.

(2) A method of elevation control for the operator including the location and description of the permanent surveying benchmark at the site; and

(3) A fill progression discussion describing the placement and compacted thickness of daily, intermediate and final cover.

b. [Reserved]

16.88. LANDSCAPE PLAN

a. The landscape plan must:

(1) Identify and locate existing vegetation to be retained and proposed vegetation to be used for cover, screening, and other purposes;

(2) Provide a seeding and planting schedule, including the identification of the rationale for the seed mixture choice and fertilization and procedures for seed application, mulching, and maintenance; and,

(3) Describe the planting plan and schedule which identifies plants to be used consistent with future use proposals.

b. [Reserved]

16.89. ENGINEERING REPORT

a. An engineering report containing a description of the existing site conditions and an analysis of the proposed landfill must be submitted. The report shall:

(1) Specify the filling rate (in tons per day) of the landfill for which approval is being sought, describing the number, types, and specifications of all necessary machinery and equipment needed to effectively operate the landfill at the prescribed filling rate;

(2) Contain a detailed description of all construction phases, including, but not limited to, the liner system, leachate collection system, and final cover system, and;

(3) Contain a site analysis of the proposed action including:

(a) The location of the closest population centers;

(b) A description of the primary transportation systems and routes of waste being transported to the landfill (ie., highways, airports, railways, etc.);

(c) An analysis of the existing topography, surface water and subsurface geological conditions;

(d) A description of the contingency plan for the construction phase that must describe procedures for responding to construction deficiencies resulting from circumstances including, but not limited to, inclement weather, defective materials or construction inconsistent with specifications as demonstrated by quality control testing. The plan must provide a description of the criteria to be utilized in evaluating deficiencies, and selecting and implementing corrective actions;

(4) Discuss the closure and post-closure maintenance and operation of the landfill which must include, but not be limited to:

(a) A closure design consistent with the requirements contained in this regulation.

(b) A post closure environmental quality monitoring program consistent with requirements contained in this regulation.

(c) An operation and closure plan for the leachate collection, treatment, and storage facilities consistent with the requirements of this regulation (Class 2 and Class 3 ISWLFs).

(d) A discussion of the future use of the site including the specific proposed or alternative uses.

Future uses must conform to the landscape plan, required by this regulation and must not adversely affect the final cover system;

(5) Include appendices demonstrating compliance with pertinent local laws and regulation pertaining to air, land, noise, and water pollution, and other supporting data, including literature citations.

b. The engineering report for new Class 1, Class 2, and Class 3 ISWLFs shall also include the following:

(1) A description of the materials and construction methods for the placement of: each monitoring well, all gas venting systems, each liner and leachate collection and removal system, leachate storage, treatment, and disposal systems, and cover systems. This description also must include a discussion of provisions to be taken to prevent frost action upon each liner system in areas where refuse has not been placed;

(2) An estimate of the expected quantity of leachate to be generated, including:

(a) An annual water budget, estimating leachate generation quantities must be prepared for periods of time of initial operation and application of intermediate cover and following facility closure. At a minimum, the following factors must be considered in the preparation of the precipitation infiltration into the landfill: average monthly temperature, average monthly precipitation, evaporation, evapotranspiration which should consider the vegetation type and root zone depth, surface/cover soil conditions and their relation to precipitation runoff which must account for the surface conditions and soil moisture holding capacity and all other sources of moisture contribution to the landfill;

(b) Liner and leachate collection system efficiencies must be calculated using an appropriate analytical or numerical assessment. The factors to be considered in the calculation of collection system efficiency must include, as a minimum, the saturated hydraulic conductivity of the liner, the liner thickness, the saturated hydraulic conductivity of the leachate collection system, the leachate collection system porosity, the base slope of the liner and leachate collection and removal system interface, the maximum flow distance across the liner and leachate collection and removal system interface to the nearest leachate collection pipe, the estimated leachate generation quantity as computed in accordance with the requirements of the preceding subparagraph; and

(c) Information gained from the collection efficiency calculations required in the preceding two subparagraphs must be used to predict the static head of leachate on the liners, volume of leachate to be collected, and the volume of leachate that may permeate through the entire liner system on a monthly basis. This assessment must also address the amount of leachate expected to be found in the leachate collection and removal system in gallons per acre per day;

(3) The design of the leachate storage facility must be based upon the leachate generation calculation. The design capacity for the leachate storage facility must be based on the proposed leachate disposal method which must allow sufficient lead time for either:

(a) Development of a separate set of engineering reports, plans and specifications for the construction and operation of a leachate treatment facility on-site and to obtain approval of this document before any discharge from the leachate storage facility; or

(b) Development of a plan to handle leachate destined for off-site treatment at a wastewater treatment facility, including a legal document (contract, local permit, etc.) certifying acceptance of leachate from the operator of the wastewater treatment facility with all conditions stipulated by the operator of the wastewater treatment facility and all such stipulations addressed in the operations plan, and to ensure that the amount of leachate stored on-site is not in excess of the storage capacity available.

16.90. QUALITY ASSURANCE/QUALITY CONTROL REPORT

a. The Quality Assurance (QA) and Quality Control (QC) report shall address the construction requirements set forth in this document for each phase of construction, this plan must include, but not be limited to:

(1) A delineation of the QA and QC management organization, including the chain of command of the QA and QC inspectors and contractors;

(2) A description of the required level of experience and training for the contractor, his crew, and QA/QC inspectors for every major phase of construction in sufficient detail to demonstrate that the installation methods and procedures required in this document will be properly implemented; and

(3) A description of the QA and QC testing protocols for every major phase of construction, and final cover installation.

b. The QA/QC report for new Class 2 and Class 3 ISWLFs shall also include, but is not limited to, QA/QC protocols for: the base liner system and leachate collection system, which must include at a minimum: the frequency of inspection, field testing, sampling for laboratory testing, the sampling and field testing procedures and equipment to be utilized, the calibration of field testing equipment, the frequency of performance audits, the sampling size, the soils or geotechnical laboratory to be used, the laboratory procedures to be utilized, the calibration of laboratory equipment and QA/QC of laboratory procedures, the limits for test failure and a description of the corrective procedures to be used upon test failure.

16.91. OPERATION AND MAINTENANCE REPORT

a. The operation and maintenance report must include, at a minimum, the following:

(1) A description of the personnel requirements, stating personnel responsibilities and duties including discussions for training and lines of authority at the landfill;

(2) A description of all machinery and equipment to be used at the landfill, their authorized uses, and safety features;

(3) A description of the operational controls, including but not limited to signs, hours and days of operation, landfill usage rules and regulations, and traffic flow controls;

(4) A characterization of the anticipated amount of industrial solid waste to be received per day, specifying the quantities received in tons per day, the fill progression of the landfill, and the method of industrial solid waste placement and compaction, and the anticipated in-place density;

(5) A description of the industrial solid waste receiving process for all industrial solid waste, including inspection of incoming loads, identification of any waste streams to be excluded, and those wastes to receive special handling, or to require treatment before receipt;

(6) A description of the cover material management plan, specifying the types of cover material (daily, intermediate, and final) identifying the quantities required and sources for each cover material by type including the method of cover material placement, compaction, and the anticipated density;

(7) A description of the gas monitoring program that must discuss explosive gas generation at the landfill and the controls used to ensure that gas generated at the landfill will not create a hazard to health,

safety, or property;

(8) A description of how winter and inclement weather operations will be conducted; and

(9) If applicable, a description of the operation of a convenience station at the landfill for smaller private vehicles to unload refuse at an area other than the landfill's working face.

b. Non-applicable portions of this section may be excluded, provided the applicant can demonstrate appropriate justification that the requirement is unnecessary.

16.92. CONTINGENCY PLAN

a. The contingency plan must discuss an organized, planned and coordinated course of action that is both technically and financially feasible, to be taken in responding to contingencies during the construction and/or operation of a landfill. The plan must address, at a minimum, actions to be taken with respect to personnel and user safety; on-site personal injury; fires; explosive landfill gases detected on site; dust; litter; odor; noise; equipment breakdown; unusual traffic conditions; vectors; disposition of unapproved wastes; receipt of unauthorized wastes; releases of hazardous or toxic materials; groundwater and surface water contamination which may include public water supply contamination as a result of an accidental spill.

b. Contingency plans for new Class 2 and Class 3 ISWLFs shall also discuss the occurrence of the leachate storage facility being at or above capacity. The contingency plan must specify the procedures to be used in response to: tank and surface impoundment spills or leakage, including removal of the waste and repair of such structures, and the event that the approved leachate treatment facility cannot accept leachate from the landfill for an indefinite period of time.

c. Non-applicable portions of this section may be excluded, provided the applicant can demonstrate appropriate justification that the requirement is unnecessary.

16.93. GROUNDWATER MONITORING PLAN

a. Upon obtaining approval of the investigations performed to satisfy section 16.81., a groundwater monitoring plan shall be submitted to the Department for review and approval. The groundwater monitoring plan shall detail the activities to be performed to ensure compliance the requirements of subpart E.

b. [Reserved]

16.94. CLOSURE PLAN

a. A closure plan shall be included in the permit application that details the activities that will be performed to satisfy the requirements of section 16.60.

b. [Reserved]

16.95. POST-CLOSURE CARE PLAN

a. A post-closure care plan shall be included in the permit application that details the activities that will be performed to satisfy the requirements of section 16.61.

b. [Reserved]

16.96. - 16.99. [Reserved]

SUBPART I

16.100. TONNAGE LIMITS

a. The Department shall, prior to issuance of a permit for a new or expanded industrial solid waste facility, approve an allowable rate of disposal based on the facilities design capacity and expected operational life. Any landfill permit issued to a facility shall include an allowable rate of disposal on a tons per year basis.

b. [Reserved]

16.101. - 16.109. [Reserved]

SUBPART J

16.110. PERMIT CONDITIONS AND PERMIT REVIEW

a. Applications for permits shall be submitted with sufficient detail to support a judgement that operation of the disposal system will not violate the Acts or regulations of the State of South Carolina. The application shall be signed by the owner and operator of the ISWLF. The approved application and associated plans and drawings shall be an enforceable part of the permit.

b. The Department shall review the permit for each ISWLF at least once every five (5) years, unless otherwise specified by the Department.

(1) If, upon review, the Department finds that material or substantial violations of the permit demonstrate the permittee's disregard for, or inability to comply with applicable laws, regulations, or requirements and would make continuation of this permit not in the best interests of human health and safety or the environment, the Department may, after a hearing, amend or revoke the permit, as appropriate and necessary. When a permit is reviewed, the Department shall include additional limitations, standards, or conditions when the technical limitations, standards, or regulations on which the original permit was based have been changed by statute or amended by regulation.

(2) The Department may amend or attach conditions to a permit when:

(a) There is a significant change in the manner and scope of operation which may require new or additional permit conditions or safeguards to protect human health and safety and the environment;

(b) The investigation has shown the need for additional equipment, construction, procedures, and testing to ensure the protection of human health and safety and the environment; and,

(c) The amendment is necessary to meet changes in applicable regulatory requirements.

c. Any permits issued pursuant to this regulation will not be valid after a period of twelve (12) months of the date of issuance if construction of the facility has not begun by the end of this period.

16.111. - 16.119. [Reserved]

SUBPART K

16.120. TRANSFER OF OWNERSHIP

a. The Department may, upon written request, transfer a permit to a new owner or operator where no other change in the permit is necessary. The proposed new owner of a permitted ISWLF shall, at least forty-five (45) days prior to the scheduled change in ownership, provide:

(1) Documentation of the new owner's name and address.

(2) Documentation of the name and address of the party responsible for the operation and maintenance of the ISWLF, if different from the owner.

(3) A written agreement signed by both parties indicating the intent to change ownership or operating responsibility of the facility. The agreement must contain a specific date for the transfer of permit responsibility.

(4) Documentation indicating that the ISWLF will be operated in accordance with the existing permit in effect at the time of transfer.

(5) [Reserved]

(6) A Disclosure Statement as required by Regulation 61-107.16., Subpart H.

b. Upon approval of all items required by section 16.120.a., the Department shall transfer the permit from the original owner of the ISWLF, to the new owner.

c. A request for a permit modification must be submitted with the transfer of ownership request, if the ISWLF will not be operated in accordance with the approved plans. The permit modification must be in accordance with all provisions of this regulation.

d. The new owner must submit legal documentation of the transfer of ownership of the ISWLF within fifteen (15) days of the actual transfer.

16.121. - 16.129. [Reserved]

SUBPART L

16.130. VIOLATIONS AND PENALTIES

a. A violation of this regulation subjects the owner of the industrial solid waste landfill to the issuance of a Department order, or to a civil or criminal enforcement action by the Attorney General's office. In addition, the Department may impose reasonable civil penalties not to exceed ten thousand dollars (\$10,000.00) for each day of violation of the provisions of this regulation, including any order, permit or standard. After exhaustion of administrative remedies, a person against whom a civil penalty is evoked by the Department may appeal the decision of the Department or Board to the court of common pleas.

b. [Reserved]

16.131. - 16.139. [Reserved]

SUBPART M

16.140. SEVERABILITY

a. Should any section, paragraph, sentence, clause or phrase of this regulation be declared unconstitutional or invalid for any reason, the remainder of this regulation shall not be affected thereby.

b. [Reserved]

16.141. - 16.149. [Reserved]

SUBPART N

16.150. APPEALS

a. An Appeal from denial of a permit shall be deemed a "contested case" as defined in S.C. Code Ann. 1-23-310 (2).

b. [Reserved]

16.151. - 16.159. [Reserved]

SUBPART O

16.160. VARIANCES

a. Any request for variances to these rules and regulations must be directed in writing to, and will be considered by the Department on an individual basis.

b. [Reserved]

16.161 - 16.169. [Reserved]

APPENDIX 1

Any of the materials listed in this appendix that have been painted with lead-based paint and/or have been in direct contact with hazardous constituents, e.g., petroleum products, pesticides, etc. are prohibited from disposal at a Class 1 Industrial Solid Waste Landfill.

Earthen material, e.g., clays, sands, gravels, and silts

Top soil

Logs

Vegetation

Tree Stumps

Rock

Root Mats

Brush and limbs

Structural steel

Hardened Concrete

Bricks and blocks

Lumber

Plaster and plasterboard

Insulation material

Shingles and roofing materials

Floor, wall, and ceiling tile

Hardened / cured asphalt (1)

Hardened cement

Pipes

Glass wire (optical fiber)

Floor coverings

Wall coverings

Tires (2)

Poly fiberglass (cured)

Fiberglass (cloth, matting, roving, etc.)

Glass

Mirrors

Nonfriable asbestos containing material (3)

(1) Tar sealant material is not acceptable

(2) Tires shall be reduced in size by a minimum of one eighth the size of the original tire prior to landfill disposal.

(3) Nonfriable asbestos-containing material which is in good condition and has not been handled in such a way as to render it a regulated material and thus subject to South Carolina DHEC R. 61-86.1, Standards of Performance for Asbestos Abatement Operations and the National Emissions Standards for Hazardous Air Pollutants [40 CFR 61 Subpart M]. Prior to disposal of any asbestos containing material, the generator of the asbestos waste shall have a "permission for disposal" letter from the Department's Bureau of Air Quality Control.