

Regulation 61-104

Hazardous Waste Management Location Standards

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I. Purpose and Scope:

A. This regulation creates State requirements for the location of hazardous waste treatment, storage, and disposal (TSD) facilities. Because the location of hazardous waste TSD facilities should be limited to those areas where there will be minimal impact on human health and the environment, all operating TSD facilities must demonstrate to the Department that their location complies with this regulation.

B. The scope of the regulation is limited to issues of public health and protection of the environment. The authority to institute land use planning and zoning is an option to be instituted by local governments in South Carolina. Although the S.C. Department of Health and Environmental Control is often requested to deny permits to industries which propose activities near residential or other areas, such requests can only be considered by the Department when public health and the environment are at risk. Aesthetic considerations, nuisances such as incidental odors, noises, and lights, or competing economic interest are mainly regulated through zoning by local governments and are not addressed in this regulation.

II. Applicability:

A. This regulation shall apply to all applicants for permits as required by R.61-79 to treat, store, or dispose of hazardous waste; provided, however, it shall not apply to those applicants for permits for post-closure activities only. For those units permitted prior to the effective date of this regulation, demonstration of compliance with these location standards shall be deemed a condition of the permit. permitted until the applicant demonstrates compliance with these location standards. For units permitted prior to the effective date of this regulation, failure to submit a demonstration of compliance with these location standards within one hundred and eighty days of the effective date of this regulation shall be deemed to be a failure to meet the conditions of the permit.

B. [Blank]

C. Demonstration of compliance with this regulation must accompany the permit application required by R.61-79.270.10 unless the application is for a permit reissuance.

III. Definitions:

A. “Adjacent” to a wetland means bordering, contiguous, neighboring, or hydrologically interconnected via surface water or groundwater. Adjacent wetlands include, but are not limited to, those areas that are separated from other waters of the State by man-made dikes, berms, or barriers, natural river berms, and beach dunes. Areas hydrologically interconnected are considered to be those where a realistic potential exists for migration of a release or spill to an adjacent wetlands via surface water or groundwater.

B. “Appurtenance” means any ancillary equipment that is stationary to the unit and contains or transports hazardous waste.

C. “Areas of complex hydrogeology” typically include, but are not limited to, karst terrane; fractured rock formations (joints and faults; excludes healed fractures) irregularly stratified geologic deposits (e.g., certain fluvial, deltaic and barrier island deposits); mixed hydrogeologic regimes (e.g., sedimentary deposits overlying fractured crystalline bedrock); folded areas where flow paths may be contorted, and recharge zones where background water quality cannot be determined.

D. “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, adjacent, or in the immediate area of the unit, because of natural or man-made 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, creep, solifluction, liquefaction, block sliding, rock fall, and slump.

E. “Braided” means a river system characterized by an intricate network of dividing and reuniting channels (frequently more than one) around a network of predominantly sand and gravel bars and islands, causing the river channels to follow a sinuous rather than straight course.

F. “Cave” means a naturally occurring cavity, recess, chamber, or series of chambers and galleries beneath the surface of the earth.

G. “Class GA groundwater” is defined in R.61-68 as those groundwaters that are characterized by either of the following factors: the groundwater is irreplaceable because no reasonable alternative source of drinking water is available to substantial populations, or the groundwater is ecologically vital because it provides the base flow for a particularly sensitive ecological system that, if polluted, would destroy a unique habitat.

H. “Coastal marine floodplain” means the area along any coast that has historically been inundated during times of flooding, but is otherwise above water, except for standing water such as in a marsh or pond.

I. “Displacement” means the relative movement of any two sides of a fault measured in any direction.

J. “Ephemeral” means a short-lived or transitory river or portion of a river that flows only in direct response to precipitation.

K. “Existing unit” means a unit which has received a hazardous waste permit by the effective date of this regulation or has met the requirements for interim status under R.61-79.270.70.

L. “Expansion or Expanding unit” means any increase in the capacity of an existing unit, as defined above, any change in the types of waste received by an existing unit, any increase in the quantities of waste received by an existing unit on a periodic basis, or the addition of a unit or units for the same activity as the existing unit.

M. “Fault” means a fracture or zone of fracturing in any material along which there has been an observable amount of displacement of the sides relative to one another and parallel to the fracture.

N. “Flow net” is a graph of flow lines and equipotential lines used in the study of groundwater flow that represents two-dimensional movement through porous media. Equivalent hydrogeologic models may be used in place of a flow net, subject to the approval of the Department.

O. “Fluvial floodplain” means the area along any river or stream that has historically been inundated during times of flooding, but is otherwise above water, except for standing water such as in a marsh, pond, or oxbow lake.

P. “Hazardous waste” means a hazardous waste as defined in R.61-79.261 of the South Carolina Hazardous Waste Management Regulations (SCHWMR).

Q. “Historical migration zone” means the area within which erosion of coastal marine, lacustrine or fluvial floodplains is predicted to occur within the next 25 years. The historical migration zone includes the following landforms: coastal marine, lacustrine, and braided or meandering fluvial systems; including

ephemeral systems and local segments of other fluvial floodplains, such as canaliform systems that are locally braided, locally meandering, or ephemeral.

R. “Holocene” means the most recent geologic epoch within the Quaternary Period, from the end of the Pleistocene epoch to the present.

S. “Horizontal ground acceleration” is the change in velocity over time relative to horizontal movement of the earth’s surface as measured at a particular point during an earthquake.

T. “Karst terrane” means areas where distinctive topography having characteristic surface and subterranean features is developed because of liquefaction of overburden or the dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terrane include but are not limited to sinkholes, closed depressions, sinking streams, caves, and blind valleys. Characteristic subsurface solution features may be evidenced by drilling rod drops and fluid loss during well drilling.

U. “Lacustrine floodplain” means the area along any lakeshore that has historically been inundated during times of flooding, but is otherwise above water, except for standing water such as in a marsh or pond.

V. “Land-based unit” means a unit which is used for the treatment, storage, or disposal of a hazardous waste and is subject to Section R.61-79.264 Subpart F including surface impoundments, landfills, waste piles, land treatment units. Units exempt from the Subpart F requirements under 264.90(b) and covered indoor waste piles in compliance with Section 264.250(c) shall be considered as non-land-based units.

W. “Locally” means a particular segment or the reach of a river which is characterized by the distance that encompasses several river bends or wave lengths, each being a minimum of eight or more channel widths.

X. “Meandering” means a sinuous river system characterized by a single main channel that is regionally characterized by a series of irregular “S” shaped curves.

Y. “Navigable waters” means those waters which are now navigable, or have been navigable at any time, or are capable of being rendered navigable by the removal of accidental obstructions, by rafts of lumber or timber or by small pleasure or sport fishing boats.

Z. “New unit” means a unit, other than an existing or expanding unit, as defined above, for which a permit decision will be made after the effective date of this regulation.

AA. “Non-land-based unit” means an incinerator, tank and its associated piping and underlying containment system, or container storage area, and other units which are used for the treatment, storage, or disposal of a hazardous waste and are not subject to Section R.61-79.264 Subpart F.

BB. “One hundred-year flood” means a flood discharge that has a one-percent chance of being equaled or exceeded in any given year.

CC. “One hundred-year floodplain” means any land area which is subject to a one percent or greater chance of flooding in any given year from any source.

DD. “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 a unit.

EE. “Post-closure activities” means those regulated activities performed at a TSD unit after closure has been completed and approved by the Department.

FF. “Public drinking water supply” means water, whether bottled or piped, provided to the public for human consumption; provided that the public drinking water supply shall not include a drinking water system serving only a single private residence or dwelling (R.61-58).

GG. “Recharge area” for a particular saturated geologic unit is defined as areas where water enters the geologic unit through downward migration. Principal examples include: outcrop areas of a particular geologic unit 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 a particular geologic unit.

HH. “Release” means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous waste or hazardous constituents into the environment including the abandonment or discarding of containers, barrels, and other closed or open receptacles containing hazardous waste or hazardous constituents.

II. “Risk Assessment” means a study consisting of Hazard Identification, Dose-Response Assessment, Exposure Assessment and Risk Characterization. The study must conform at least to the EPA Guidance: “Superfund Public Health Evaluation Manual” EPA #540/1-86/06 October 1986 or more stringent guidelines as established by the Department.

JJ. “Sole source aquifer” is defined as specified in the Federal Safe Drinking Water Act.

KK. “Structural integrity” means the ability of a unit to withstand physical forces exerted upon designed components, appurtenances, and containment structures (e.g., liners, dikes) of the unit.

LL. “Underground mine” means any subterranean excavation for minerals or ores having a roof of undisturbed rock (as opposed to open-pit excavations).

MM. “Washout” means the movement of hazardous waste from the unit as a result of a flood event.

NN. “Wetland(s)” means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands must possess three essential characteristics: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology.

IV. Location Criteria:

A. Adverse geologic and hydrologic settings:

1. Seismic considerations:

a. New and expanding land-based and non-land-based units shall not be located within a minimum of two hundred feet of a fault where displacement during the Holocene Epoch within the Quaternary Period has occurred. The setback distance or the time period for displacement may be expanded by the Department as necessary to protect human health and the environment.

b. Owners or operators of new and expanding land-based and non-land-based units must demonstrate to the satisfaction of the Department that the structural integrity of the unit will allow it to

maintain confinement of the hazardous waste or hazardous waste constituents such that no adverse environmental or health impacts will occur during and after any ground movement, liquefaction, or seismic wave motion equal to the maximum horizontal acceleration predicted with a ten percent probability of occurrence at the site in two hundred and fifty years.

c. Owners or operators of existing land-based and non-land-based units must submit to the Department an amended closure plan and close in accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR's unless the owners or operators can demonstrate to the satisfaction of the Department that the requirements specified in paragraphs 1.a. and 1.b. of this section are met for the existing units.

2. Floodplains

a. New and expanding land-based units and appurtenances shall not be located in a one hundred-year floodplain or in the historical migration zone of coastal marine, lacustrine, or braided or meandering fluvial system.

b. New and expanding non-land-based units and appurtenances shall not be located in a one hundred-year floodplain or the historical migration zone of a coastal marine, lacustrine, or braided or meandering fluvial system, unless the owner or operator demonstrates to the satisfaction of the Department that the unit and appurtenances are designed, constructed, operated, and maintained to prevent the washout of any hazardous waste by a one-hundred-year flood, and to enable the unit to withstand the effects of erosion during its active life.

c. Owners or operators of existing land-based and non-land-based units and appurtenances located in a one hundred-year floodplain, but outside the historical migration zone of a coastal marine, lacustrine, and braided or meandering fluvial system, must submit to the Department an amended closure plan and close in accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR unless the owner or operator can demonstrate to the satisfaction of the Department that such units and appurtenances are designed, operated, and maintained to prevent washout of any hazardous waste by a one hundred-year flood, and that such units and appurtenances can withstand the effects of erosion during their active life.

d. Owners or operators of existing land-based units and appurtenances located inside the historical migration zone of a coastal marine, lacustrine, braided or meandering fluvial system must submit to the Department an amended closure plan and close in accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR.

e. Owners or operators of existing non-land-based units and appurtenances located inside the historical migration zone of a coastal marine, lacustrine, or braided or meandering fluvial system must submit to the Department an amended closure plan and close in accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR unless the owner or operator can demonstrate to the satisfaction of the Department that the unit and appurtenances are designed, constructed, operated, and maintained to withstand the effects of erosion during its active life.

f. The historical migration zone, as outlined under paragraphs 2.a. through 2.e., shall be determined by the owner or operator through a geomorphic study as approved by the Department.

3. Underground mines and caves; the placement of any hazardous waste in any underground mine or cave is prohibited.

B. Unstable terrains

1. Karst

a. New and expanding land-based and non-land-based units shall not be located in karst terrane unless the owner or operator demonstrates to the satisfaction of the Department that:

(1) A geotechnical and hydrogeologic investigation of the site shows that the site is historically stable and subsidence into or collapse of subsurface solution cavities as a consequence of instability caused by liquefaction of overburden or by the dissolution of soluble rocks will not occur; or

(2) Where the requirement of paragraph 1.a.(1) cannot be met, that appropriate engineered measures are applied to ensure the unit's structural integrity and to contain or eliminate any adverse effects to human health and the environment that may occur as a result of karst terrane.

b. Owners or operators of existing land-based or non-land-based units located in karst terrane must submit to the Department an amended closure plan and close in accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR's, unless the appropriate demonstration specified in paragraphs 1.a. of this section is made to the satisfaction of the Department.

2. Poor foundation conditions

a. New and expanding land-based and non-land based units shall not be located in regions where poor foundation conditions may exist unless the owner or operator demonstrates to the satisfaction of the Department the following:

(1) The absence of poor foundation conditions at, beneath, adjacent, or in the immediate area of the unit; or,

(2) If poor foundation conditions exist, the problem conditions are corrected.

b. Owners or operators of existing land-based and non-land-based units located in regions where poor foundation conditions may exist must submit to the Department an amended closure plan and close in accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR, unless the owner or operator demonstrates to the satisfaction of the Department:

(1) The absence of poor foundation conditions, at, beneath, and adjacent to the unit, or in the immediate area of the unit, or

(2) If poor foundation conditions exist, the problem conditions can and will be corrected by modifying subsurface soil conditions, unit location, or design and operation of the unit.

3. Areas susceptible to mass movement.

a. New and expanding land-based and non-land-based units shall not be located in regions where mass movement may occur unless the owner or operator demonstrates to the satisfaction of the Department the following:

(1) That the unit is not in an area susceptible to mass movement, or

(2) If evidence of mass movement exists, appropriate engineered measures are applied to ensure unit structural integrity and to eliminate the threats posed to human health and the environment by mass movement.

b. Owners or operators of existing land-based and non-land-based units located in regions where mass movement may occur must submit to the Department an amended closure plan and close in accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR, unless the owner or operator demonstrates to the satisfaction of the Department the following:

(1) The unit is not in an area susceptible to mass movement, or

(2) If evidence of mass movement exists, appropriate engineered measures can and will be applied to ensure unit structural integrity and to eliminate the threats posed to human health and the environment by mass movement.

C. Media-specific requirements

1. Groundwater

a. Groundwater vulnerability.

(1) New land-based units and expansions of existing land-based units are prohibited in areas where the owner or operator cannot demonstrate to the satisfaction of the Department:

(a) That the unit is underlain by a protective clay or silty clay unit. The thickness of this unit must be greater than five feet. The hydraulic conductivity of this unit must not exceed $1E-06$ centimeters per second. This unit must be composed of materials with a protective high ion exchange capacity and it should have a high organic content. The continuity of this protective unit must be such that it exceeds a minimum of two hundred feet in the hydraulically upgradient direction and a minimum of five hundred feet in the hydraulically sidegradient directions, and it is continuous from below the site to the point where shallow groundwater is discharging to the nearest surface water body; and

(b) That the site is not located in an area where the hydrogeologic conditions allow the migration of groundwater in shallow geologic units, having little potential as an underground source of drinking water, into deeper units. Specific detail concerning this requirement are as follows. At all locations across the site, the potentiometric head in the shallow saturated geologic material overlying the confining unit described in paragraph (a) of this section must be lower than the potentiometric surface of the geologic material below the confining unit (i.e., an upward hydraulic gradient must exist). If the material above the confining unit is not permanently saturated under natural conditions, then the potentiometric head in the geologic units underlying the confining unit must be at an elevation higher than the top of the confining unit; and

(c) That a minimum ten foot separation can be maintained between the base of the waste management unit and the high water table as it exists naturally, or through long-term, permanent and maintenance-free methods; and

(d) That a minimum fifteen foot vertical separation of naturally occurring or engineered material can be maintained between the base of the constructed liner and bedrock. The nature of the material making up this interval is subject to Department approval; and

(e) That the unit is not located over an area where a stratum of limestone exhibiting secondary permeability with an average thickness of greater than five feet lies within fifty feet of the base of the unit.

(f) That a unit can be located such that if a leak should occur, the resulting groundwater discharge to the receiving surface water body shall not contravene standards set by the State Water Classifications and Standards (R.61-68).

(2) Owners or operators of existing land-based units which cannot meet the requirements of paragraph (1) of this section shall submit to the Department an amended closure plan and close the unit in accordance with the requirements in R.61-79.264 or 265 Subpart G of the SCHWMR's, unless, except in the case (1)(e) of this section, appropriate engineered measures are applied to ensure the unit's structural integrity and to contain or eliminate any adverse effects to human health and the environment that may occur as a result of a release from the unit.

(3) New and expanding non-land-based units are prohibited in areas where the owner or operator cannot demonstrate to the satisfaction of the Department that the requirements of paragraph (1) of this section are met or that appropriate engineered measures are applied to ensure the unit's structural integrity and to contain or eliminate any adverse effects to human health and the environment that may occur as a result of a release from the unit.

(4) Owners or operators of existing non-land-based units which cannot meet the requirements of paragraph (1) of this section shall submit to the Department an amended closure plan and close the unit in accordance with the requirements in R.61-79.264 or 265 Subpart G of the SCHWMR's unless appropriate engineered measures are applied to ensure the unit's structural integrity and to contain, or eliminate any adverse effects to human health and the environment that may occur as a result of a release from the unit.

b. Complex hydrogeology.

(1) New land-based units and expansions of existing land-based units are prohibited in areas where the owner or operator cannot demonstrate to the satisfaction of the Department:

(a) That the hydrogeologic properties of the site can be adequately characterized. The characterization shall include a detailed description of the geologic units below the site (including mineralogy, sedimentary structures, thickness, continuity, and structure), the hydraulic properties of each geologic unit (including secondary porosity and a discussion of variations noted across the site), and direction and rate of groundwater flow within the uppermost aquifer and all interconnected aquifers and confining units using a groundwater flow net. In addition, the relationship between the units below the site to locally and regionally recognized geologic and hydrogeologic units must be described; and

(b) Compliance with the groundwater monitoring requirements under R.61-79.264 Subpart F of the SCHWMR's and

(c) The feasibility of a corrective action program at the site. The demonstration shall show how a corrective action response will be effectively implemented to prevent a release to groundwater from migrating beyond the facility property boundary. The corrective action feasibility demonstration shall illustrate all the factors that are necessary to be in compliance with the corrective action requirements under R.61-79.264 Subpart F of the SCHWMR's.

(2) Owners or operators of existing land-based units in areas which cannot meet the requirements of paragraph (1) of this section shall submit to the Department an amended closure plan and close the unit in accordance with the requirements in R.61-79.264 or 265 Subpart G of the SCHWMR's.

(3) New and expanding non-land-based units are prohibited where the owner or operator cannot demonstrate to the satisfaction of the Department that the requirements of paragraph (1) of this section are met or that appropriate engineered measures are applied to ensure the unit's structural integrity and to contain or eliminate any adverse effects to human health and the environment that may occur as a result of a release from the unit.

(4) Owners or operators of existing non-land-based units which cannot meet the requirements of paragraph (1) of this section shall submit to the Department an amended closure plan and close the unit in accordance with the requirements in R.61-79.264 or 265 Subpart G of the SCHWMR's unless appropriate engineered measures are applied to ensure the unit's structural integrity and to contain or eliminate any adverse effects to human health and the environment that may occur as a result of a release from the unit.

c. Groundwater resource value.

(1) New land-based units and expansions of existing land-based units shall not be located over Class GA groundwater or over the recharge area for Class GA groundwater as designated by the Department, over a sole source aquifer, or over the recharge area for a sole source aquifer as designated by the Department.

(2) Owners or operators of existing land-based units which cannot meet the requirements of paragraph (1) of this section shall submit to the Department an amended closure plan and close the unit in accordance with the requirements in R.61-79.264 or 265 Subpart G of the SCHWMR's.

(3) New and expanding non-land-based units are prohibited in areas where the owner or operator cannot demonstrate to the satisfaction of the Department that the requirements of paragraph (1) of this section are met, or that appropriate engineered measures are applied to ensure the unit's structural integrity and to contain or eliminate any adverse effects to human health and the environment that may occur as a result of a release from the unit.

(4) Owners or operators of existing non-land-based units which cannot meet the requirements of paragraph (1) of this section shall submit to the Department an amended closure plan and close the unit in accordance with the requirements in R.61-79.264 or 265 Subpart G of the SCHWMR's unless appropriate engineered measures are applied to ensure the unit's structural integrity and to contain or eliminate any adverse effects to human health and the environment that may occur as a result of a release from the unit.

2. Surface water

a. New and expanding land-based and non-land-based units shall be prohibited in the following areas:

(1) Within a minimum of one thousand feet of any navigable waters.

(2) Within that portion of the drainage basin included in a one-half mile radius, at a minimum, on the upstream side of a public drinking water supply intake from a river or stream;

(3) Within that portion of the drainage basin which is within one-half mile, at a minimum, of a lake, pond, or reservoir used as a source of public drinking water supply.

b. The owner or operator of existing land-based and non-land-based units located within the prohibited areas listed in 2.a. above must submit to the Department an amended closure plan and close in

accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR's unless the owner or operator demonstrates to the satisfaction of the Department the following:

(1) The capability of the unit and the area within the prohibited areas listed in 2.a. above to control and/or contain run-off from the maximum rainfall in twenty four hours from the twenty five-year storm and the capability to divert run-on from land adjoining this area and the unit during such a storm unless sufficient capacity is included in the run-off system to control and/or contain run-on.

(2) The result of any release of hazardous waste to the receiving surface water body will not contravene standards set by the State Water Classifications and Standards (R.61-68).

c. No new and expanding unit shall be located within a minimum of one-half mile of a federally designated wild and scenic river or a state designated scenic river.

3. Air

a. New and expanding hazardous waste units shall not be located in an EPA designated non-attainment area unless the owner or operator demonstrates, prior to operation, that the unit will be in compliance with the Department's Air Pollution Control Requirements for non-attainment areas.

b. The owner or operator of new, expanding and existing hazardous waste units must describe air quality problems which may result from the maximum operations of hazardous waste units. To provide information on the facility's impact on air quality, the owner or operator must prepare an assessment of the air quality impacts which may occur based on historical or estimated meteorological conditions and to what extent such respective problems and conditions will affect neighboring communities including potential damage to wildlife, crops, vegetation and physical structures, public health and the environment.

c. The owner or operator of new, expanding and existing hazardous waste units must prepare a plan for operations when an Air Stagnation Advisory (ASA) is issued for the area in which the hazardous waste unit is located. An ASA is issued by the national Weather Service to local media and is broadcast on the National Oceanic and Atmospheric Association (NOAA) radio network. The facility must describe what actions will be taken to minimize emissions for the duration of the ASA. In addition, the facility must describe what actions will be taken in the event that any stage of an air pollution episode (as described in SC Air Pollution Control Regulation No. 61-62.3) is declared for that area. These actions must, at a minimum, meet the requirements set forth in Section II of SC Air Pollution Control Regulation No. 61-62.3 for those operations directly related to the facility's hazardous waste unit.

D. Ecological resources:

1. Wetlands

a. New land-based and non-land-based units shall be prohibited in or adjacent to wetlands.

b. Expansions of existing land-based and non-land-based units shall be prohibited in wetlands.

c. Expansions of existing land-based and non-land-based units shall be prohibited adjacent to wetlands unless the following requirements are met by the owner or operator:

(1) All expansion will be a minimum of five hundred feet from a wetlands.

(2) The owner or operator must demonstrate to the satisfaction of the Department long-term integrity of the unit so as to prevent migration of hazardous waste or hazardous constituents into the wetland and to ensure protection of human health and the environment. Such a demonstration shall include adequate design elements and operating procedures to address the following factors:

(a) Erosion, stability, and migration potential of native wetland soils, muds, and deposits used to support the unit or ancillary structures,

(b) Erosion, stability, and migration potential of dredged and fill materials used to support the unit or ancillary structures,

(c) Pathways for movement of hazardous waste or constituents and the migration potential of these materials in the event of a release from the unit,

(d) Ease and ability of characterizing groundwater and surface water flow rates and directions and the effectiveness of groundwater and surface water monitoring in the presence of tidal and other hydrogeologic influences, and

(e) Any additional factors, as necessary, to demonstrate that the integrity of the unit in or adjacent to the wetland is sufficiently protective of human health and the environment.

(3) The owner or operator must demonstrate to the satisfaction of the Department that the unit will be designed and operated so as to provide adequate protection of the ecological resources of the wetland from migration of hazardous waste or hazardous constituents. The demonstration shall include, but not be limited to, consideration of the following factors:

(a) The nature and chemical characteristics of the waste and constituents managed in the unit including its persistence, toxicity, mobility, and propensity to bioaccumulate,

(b) Impacts on fish, wildlife, and other marine resources and their habitat from releases of hazardous wastes or hazardous constituents that may result as a consequence of a unit expansion,

(c) The potential effects of catastrophic hazardous waste or constituent releases to the wetland and the resultant impacts on the environment, and

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

(4) The owner or operator shall offset unavoidable wetland impacts through wetlands restoration or creation.

(5) The owner or operator must comply with other Federal requirements, as applicable, including Section 10 of the Rivers and Harbors Act of 1899, Executive Order 11990 (Protection of Wetlands), and Executive Order 11988 (Floodplain Management).

(6) Where the proposed expansion involves the discharge of dredged or fill material in a wetland or other waters of the United States, the owner or operator must apply for a permit by the U. S. Army Corps of Engineers as required under Section 404 of the Clean Water Act.

d. Owner or operators of existing land-based or non-land-based units located in or adjacent to a wetland, including wetlands within the facility property, shall close the unit unless the requirements under paragraphs 1.c.(1)-(6) of this section are met.

2. Other environmentally sensitive areas

a. New and expanding land-based and non-land-based units shall be prohibited in the following areas:

(1) On prime farmland as designated by the United States Soil Conservation Service;

(2) Within an area that will adversely impact an archeological site as determined by the State Historic Preservation Officer and the State Archaeologist or a historic site as determined by the State Historic Preservation Officer;

(3) Within a minimum of one-half mile of national or state parks, national wildlife refuges, major water impoundments of one hundred acres or larger, state heritage preserves as defined in Section 51-17-10 of the South Carolina Code of Laws, designated wilderness areas of a national forest, and areas of special national or regional natural, recreational, scenic, or historic value, or other significant environmentally sensitive areas.

b. The owner or operator of existing land-based and non-land-based units located within the prohibited areas listed in 2.a. above must submit to the Department an amended closure plan and close in accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR's, unless the owner or operator demonstrates to the satisfaction of the Department that the environmentally sensitive area is adequately protected and will not be adversely affected by the hazardous waste activity at the unit.

E. Buffer zones and setbacks:

1. Buffer zones

a. Owners or operators of new, expanding, and existing land-based units shall establish a dedicated buffer zone of at least but not necessarily limited to two hundred feet, between the unit and the facility property boundary. The required distance will include the minimum of two hundred feet, and any additional distance determined appropriate to adequately ensure that groundwater time-of-travel measured along a one-hundred foot flow line originating at the base of the unit, allows adequate time to implement the corrective action response necessary to remedy a hazardous waste release to groundwater and to contain or eliminate the release within the facility property boundary. Calculation of the groundwater time-of-travel shall be made as specified under EPA Document (530-SW-86-0228) entitled Criteria for Identifying Areas of Vulnerable Hydrogeology under the Resource Conservation and Recovery Act.

b. New and expanding land-based units that cannot establish a dedicated buffer zone to fulfill the requirements under paragraph 1.a. of this section are prohibited.

c. Owners or operators of existing land-based units that cannot establish a dedicated buffer zone to fulfill the requirements under paragraph 1.a. of this section shall submit to the Department an amended closure plan and close the unit in accordance with the requirements in R.61-79.264 or 265 Subpart G of the SCHWMR's, unless plans are submitted to the Department for appropriate additional measures to ensure an equivalent level of protection to human health and environment, which may include, but not necessarily be limited to:

- (1) Groundwater Monitoring;
- (2) Installation of recovery wells; and
- (3) Development of a contingent corrective action plan.

d. A dedicated buffer zone as required under paragraph 1.a. of this section shall meet the following criteria:

- (1) Shall consist of an area of land between the unit and the facility property boundary, that is owned by the owner or operator and serves as a separation distance between the unit and the facility property boundary and must remain accessible for corrective action as necessary. The buffer zone shall not be used for the treatment, storage or disposal of hazardous waste;
- (2) Shall serve as a buffer zone for as long as hazardous constituents remain in the unit; and
- (3) Shall be recorded as a notation on the facility property deed as a dedicated portion of the facility property for the sole purpose for which it is intended as specified under paragraphs d.(1) and d.(2) of this section.

2. Setbacks

a. For new and expanding units, the owner or operator shall meet the following setback distances at the time of permit application to the Department.

(1) No land-based or non-land-based unit shall be located within a minimum of two thousand feet of any existing church, school, hospital, or any other structure which is routinely occupied by the same person or persons more than twelve hours per day or by the same person or persons under the age of eighteen for more than two hours per day, except those owned by the applicant.

(2) A land-based unit must not be located within a minimum of one thousand feet in the downgradient direction, a minimum of fifteen hundred feet in the sidegradient direction and at any distance upgradient of any well used as a source of water for human or animal consumption and/or bathing or irrigation that is in a hydrologic unit, potentially impacted by the unit. When evaluating this criteria, consideration must be given to the existing and potential use of groundwater. Exceptions to this requirement may be granted if the petitioner can demonstrate to the satisfaction of the Department that the hydrogeologic conditions below the site provide protection to the aquifer in use.

b. Existing land-based and non-land-based units that cannot meet a required setback distance under paragraph a. of this section shall submit to the Department an amended closure plan and close in accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR, unless they perform a risk assessment, as approved by the Department, that demonstrates public health and the environment will be adequately protected.

F. Transportation and preparedness:

1. Transportation; new and expanding land-based and non-land-based units shall be prohibited and existing land-based and non-land-based units shall submit to the Department an amended closure plan and close in accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR's unless the transportation corridors will minimize the potential for and effects of hazardous spills and accidents in populated communities by demonstrating the following:

a. Access to sites by surface and water transportation modes shall be by roads, rails and water ways with the capacity to accept the demands created by the facility.

b. The facility must be located such that when conveyed on roadways, hazardous waste will be transported on interstate, state, or county highways or other roads which are well maintained, well constructed, free of obstructions and with a high degree of visibility. No hazardous waste shall be transported on roads where weight restrictions for the road or any bridge on the road will be exceeded in the selected route of travel.

c. The facility must be located such that an existing and acceptable alternate route is available if access by the primary transportation corridor is blocked.

2. Preparedness

a. No unit shall be located at a facility where the owner or operator cannot reach an agreement with the Local Emergency Planning Committee (LEPC) for appropriate emergency services unless the owner or operator: (1) documents the refusal of the LEPC to enter into such agreements; and (2) makes appropriate arrangements with the local emergency service authorities such as fire, police, hospitals, and local contractors.

b. The Department reserves the right to require more than minimum requirements for the purpose of protecting public health and the environment, and reserves the right to deny siting approval if adequate emergency preparedness requirements are not provided either through agreements or by the applicant.

c. Owners or operators of existing units which cannot demonstrate to the satisfaction of the Department compliance with paragraphs a. and b. of this section must submit an amended closure plan and close in accordance with the procedures specified in R.61-79.264 Subpart G of the SCHWMR's.

V. Certification; the information submitted in compliance with this regulation shall be prepared by or under the direct supervision of a professional engineer or geologist as required in the 1976 Code of Laws of South Carolina as amended, Title 40. Chapters 21 and 77.

VI. Severability; 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.