567—113.6(455B) Siting and location requirements for MSWLFs. This rule applies to new MSWLF units and horizontal expansions of existing MSWLF units. Except for paragraphs 113.6(2)*"a,"* 113.6(2)*"b"* and 113.6(2)*"f,"* this rule does not apply to permitted MSWLF units which have been approved prior to October 1, 2007. Information required to document compliance with the requirements of rule 113.6(455B) shall be consolidated and maintained in a site exploration and characterization report pursuant to subrule 113.6(4).

113.6(1) *Local siting approval.* The department will not consider a permit application for a new MSWLF unless local siting approval pursuant to Iowa Code section 455B.305A, if applicable, has been obtained.

113.6(2) *Location restrictions.* All MSWLFs shall comply with the following location restrictions.

a. Airports. For purposes of this chapter:

"Airport" means public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities.

"Bird hazard" means an increase in the likelihood of bird-aircraft collisions that may cause damage to the aircraft or injury to its occupants.

(1) A prohibition on locating a new MSWLF near certain airports was enacted in Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Ford Act), Pub. L. 106-181 (49 U.S.C. 44718 note). Section 503 prohibits the "construction or establishment" of new MSWLFs after April 5, 2000, within six miles of certain smaller public airports. The Federal Aviation Administration (FAA) administers the Ford Act and has issued guidance in FAA Advisory Circular 150/5200-34A, dated January 26, 2006.

(2) Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions that are located within 10,000 feet (3,048 meters) of any airport runway end used by turbojet aircraft or within 5,000 feet (1,524 meters) of any airport runway end used by piston-type aircraft only must demonstrate to the FAA that the units are designed and operated so that the MSWLF unit does not pose a bird hazard to aircraft. The owner or operator must place the demonstration of this requirement in the operating record and submit to the department a copy of the demonstration approved by the FAA.

(3) Owners or operators proposing to site new MSWLF units and lateral expansions within a five-mile radius of any airport runway end used by turbojet or piston-type aircraft must notify the affected airport and the FAA. A copy of these notifications shall be submitted to the department.

b. Floodplains. For purposes of this chapter:

"Floodplain" means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands that may be inundated by a 100-year flood.

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

"Washout" means the carrying away of solid waste by waters of the base flood.

Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in 100-year floodplains must demonstrate to the department that the unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of 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 submit a copy of the demonstration to the department.

c. Wetlands. For purposes of this chapter:

"Wetlands" means those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

New MSWLF units and lateral expansions 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 or 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 MSWLF unit will not:

1. Cause or contribute to violations of any applicable state water quality standard;

2. Violate any applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act;

3. 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; and

4. Violate any requirement under the Marine Protection, Research, and Sanctuaries Act of 1972 for the protection of a marine sanctuary;

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

1. Erosion, stability, and migration potential of native wetland soils, muds and deposits used to support the MSWLF unit;

2. Erosion, stability, and migration potential of dredged and fill materials used to support the MSWLF unit;

3. The volume and chemical nature of the waste managed in the MSWLF unit;

4. Impacts on fish, wildlife, and other aquatic resources and their habitats from release of the solid waste;

5. The potential effects of catastrophic release of waste to wetlands and the resulting impacts on the environment; and

6. 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 or 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 subparagraph 113.6(2)*"c"*(1), 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 human-made wetlands); and

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

d. Fault areas. For the purposes of this chapter:

"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.

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

"Holocene" means the most recent epoch of the Quaternary Period, extending from the end of the Pleistocene Epoch to the present.

New MSWLF units and lateral expansions shall not be located within 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 200 feet (60 meters) will prevent damage to the structural integrity of the MSWLF unit and will be protective of human health and the environment.

e. Seismic impact zones. For the purposes of this chapter:

"Seismic impact zone" means an area with a 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 250 years.

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

"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. "Lithified earth material" does not include human-made materials, such as fill, concrete, and asphalt, or unconsolidated earth materials, soil, or regolith lying at or near the earth's surface.

New MSWLF units and lateral expansions 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 submit a copy of the demonstration to the department.

f. Unstable areas. For purposes of this chapter:

"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 may include poor foundation conditions, areas susceptible to mass movements, and karst terranes.

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

"Poor foundation conditions" means those areas where features exist which indicate that a natural or human-induced event may result in inadequate foundation support for the structural components of an MSWLF unit.

"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 MSWLF unit, because of natural or human-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 fluction, block sliding, and rock fall.

"Karst terranes" 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 terranes include, but are not limited to, sinkholes, sinking streams, caves, large springs, and blind valleys.

Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in an unstable area must demonstrate to the department that engineering measures have been incorporated into the MSWLF unit's design to ensure that the integrity of the structural components of the MSWLF unit will not be disrupted. The owner or operator must place the demonstration in the operating record and submit a copy of the demonstration to the department. 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 human-induced events (both surface and subsurface).

g. Threatened or endangered flora and fauna.

(1) All MSWLF owners or operators shall contact the department's Iowa Natural Areas Inventory with a request to search its records to determine the presence of, or habitat for, any threatened or endangered species or communities of flora or fauna on the proposed site. In the event that the department's Iowa Natural Areas Inventory does not contain records of threatened or endangered species or communities but their presence is suspected, then the permit applicant shall conduct a site survey.

(2) Should any threatened or endangered species be identified pursuant to subparagraph 113.6(2)*"g"*(1), the permit applicant shall demonstrate to the department that the MSWLF unit will not cause or contribute to significant degradation of the threatened or endangered species or communities.

h. Cultural resources.

(1) All MSWLF owners and operators shall prepare a comprehensive listing of, and assessment of the impact on, any archaeologically, historically, or architecturally significant properties on the proposed

site. To assess the impact, the permit applicant shall consult with the historic preservation bureau of the state historical society of Iowa.

(2) Should any significant cultural resources be identified pursuant to subparagraph 113.6(2)*"h"*(1), the permit applicant shall demonstrate to the department that the MSWLF unit will not cause or contribute to significant degradation of those cultural resources.

i. Separation from groundwater. The base of an MSWLF unit shall be situated so that the base of the waste within the proposed unit is at least 5 feet above the high water table unless a greater separation is required to ensure that there will be no significant adverse effect on groundwater or surface waters or a lesser separation is unlikely to have a significant adverse effect on groundwater or surface waters. Artificial means of lowering the high water table are acceptable. The separation of the base of an MSWLF unit from the high water table shall be measured and maintained in a manner acceptable to the department.

j. Wells and community water systems. An MSWLF unit shall not be within 1,000 feet of any potable well or community water system in existence at the time of receipt of the original permit application or application to laterally expand the permitted MSWLF unit for the facility that is being used for human or livestock consumption. Groundwater monitoring wells are exempt from this requirement. The department may also exempt extraction wells utilized as part of a remediation system from this requirement. A new MSWLF unit shall not be within 1,000 feet of a downgradient agricultural drainage well.

k. Property line setback. An MSWLF unit shall be at least 50 feet from the adjacent property line.

l. Housing and sensitive populations. An MSWLF unit shall not be within 500 feet of an occupied residence, recreational area, child care facility, educational facility, or health care facility in existence at the time of receipt of the original permit application or application to laterally expand the permitted MSWLF unit, unless there is a written agreement between the MSWLF owner and such facility. The written agreement shall be filed with the county recorder for abstract of title purposes, and a copy submitted to the department.

113.6(3) *Soil and hydrogeologic investigations.* An MSWLF shall have a qualified groundwater scientist, as defined in paragraph 113.10(1)*"d,"* to conduct a soil and hydrogeologic investigation in accordance with this subrule. The purpose of this investigation is to obtain data to determine potential routes of contaminant migration via groundwater. Such information is vital for completion of the site exploration and characterization report, and the hydrologic monitoring system plan and design. This subrule sets forth the minimum requirements for soil and hydrogeologic investigations. The MSWLF shall comply with this subrule unless the department issues written approval due to specific site conditions.

a. Number of borings. A sufficient number of borings shall be made to accurately identify the stratigraphic and hydrogeologic conditions at the site.

b. Depth of borings. Unless otherwise approved by the department in writing, the following requirements shall apply to the depth of borings.

(1) All borings shall be a minimum of 25 feet deep and at least 10 feet below the water table.

(2) At a minimum, half of all borings shall extend 20 feet into the uppermost aquifer, 50 feet below the water table, or 10 feet into bedrock.

(3) At a minimum, one boring shall extend 10 feet into bedrock or 100 feet below the lowest ground surface elevation.

(4) All borings shall be of sufficient depth to correlate strata between borings.

c. Boring method and soil samples.

(1) Continuous samples shall be collected for all borings, unless otherwise approved by the department in writing.

(2) Boring logs shall be as detailed as possible in describing each stratum.

(3) Samples shall be clearly marked, preserved and transported in accordance with laboratory procedures.

(4) The permit applicant shall keep and preserve samples until at least 30 days after the permit is issued.

(5) Soil samples from each stratum shall be tested for falling-head permeability and grain size distribution.

d. Conversion of or plugging borings.

(1) Borings may be converted to piezometers or monitoring wells. However, the conversion of such borings does not guarantee that more piezometers or monitoring wells will not be required in the department-approved hydrologic monitoring system plan and design.

(2) Borings not converted to piezometers or monitoring wells shall be plugged and properly sealed so as not to create pathways for subsurface or surface pollution migration. Borings converted to piezometers or monitoring wells may still need to be partially plugged depending on the depth of the boring. Plugging shall be performed pursuant to paragraph 113.10(2)*"d."*

e. Soil and hydrogeologic investigation description and analysis. A soil and hydrogeologic investigation description and analysis shall be completed and maintained and, at a minimum, shall contain the following:

(1) The boring logs pursuant to subparagraph 113.6(3)*"c"*(2).

(2) A description of the properties of each soil and bedrock stratum as appropriate, including:

1. Soil texture and classification.
2. Particle size distribution.
3. Mineral composition, cementation, and soil structure.
4. Permeability, including horizontal and vertical permeability, and porosity.
5. Geologic structure, including strike, dip, folding, faulting and jointing.
6. Previous activities and infrastructure at the site that could affect geology and hydrogeology, such as but not limited to mining, quarry operations, borrow pits, waste disposal, storage tanks, pipelines, utilities and tile lines.
7. Lenses and other discontinuous units, voids, solution openings, layering, fractures, other heterogeneity, and the scale or frequency of the heterogeneity.
8. Correlation and continuity of strata between borings.

(3) Descriptions of the hydrogeologic units within the saturated zone, including:

1. Thickness.
2. Hydraulic properties, including as appropriate, conductivity, transmissivity, storativity, and effective porosity.
3. Concentrations of chemical constituents listed in Appendix I present in the groundwater of hydrogeologic units and the source of those constituents, if known.
4. Role and effect of each hydrogeologic unit as an aquifer, aquitard, or perched saturated zone.
5. The actual or potential use of the aquifers as water supplies.

(4) Plan view maps, and a series of cross sections with two oriented perpendicular and two oriented parallel to the predominant directions of groundwater flow through the MSWLF unit, showing:

1. The extent of soil and bedrock strata.
2. The position of the water table.
3. The position of the uppermost aquifer.
4. Measured values of hydraulic head.
5. Equipotential lines and inferred groundwater streamlines of the water table, and the uppermost aquifer if different from the water table.
6. Location of soil and bedrock borings.
7. Location of piezometers and monitoring points, if any.

(5) A description and evaluation of horizontal and vertical groundwater flow which specifically addresses the following and their significance to the movement of pollutants carried by groundwater:

1. Local, intermediate and regional groundwater systems.
2. Groundwater recharge and discharge areas within and immediately surrounding the facility, including interactions with perennial and intermittent surface waters and how the facility affects recharge rates.
3. Existing and proposed groundwater and surface water withdrawals.

4. The effects of heterogeneity, fractures or directional differences in permeability on groundwater movement.

5. Directions of groundwater movement, including vertical components of flow, specific discharge rates and average linear velocities within the hydrologic strata.

6. Seasonal or other temporal fluctuations in hydraulic head.

7. The effect of existing and proposed MSWLF units.

(6) An analysis of potential impacts on groundwater and surface water quality, and water users, in the event of a theoretical release at the most downgradient portion of each MSWLF unit. The analysis shall at a minimum utilize contaminants and indicator parameters with high mobility in groundwater (e.g., chlorides, organic solvents). This analysis shall include:

1. Assumptions and approximations utilized, and why they were utilized.

2. If a model is utilized, a thorough description of models used and each model's capabilities and limitations, including the reliability and accuracy of the models in actual field tests.

3. Projected paths and rates of movement of contaminants found in leachate.

(7) Recommendations for the location of the proposed MSWLF unit and conceptual design based on hydrogeologic information.

113.6(4) *Site exploration and characterization report.* An MSWLF shall maintain a site exploration and characterization report. At a minimum, the site exploration and characterization report shall detail compliance with the requirements of rule 113.6(455B) and shall contain the following components.

a. A title page and index.

b. A legal description of the site.

c. Proof of the applicant's ownership of the site and legal entitlement to use the site as an MSWLF. If the applicant does not own the site, then proof of legal entitlement to the site, such as, for example, a lease, must be submitted. Such legal entitlement must include the following:

(1) Provisions that allow continued disposal operations until closure of the facility.

(2) Provisions for the performance of facility closure operations.

(3) Provisions for postclosure care for at least a 30-year period after facility closure.

d. Proof of the applicant's local siting approval pursuant to Iowa Code section 455B.305A, if applicable.

e. Scaled maps or aerial photographs locating the boundaries of the facility and identifying:

(1) North and other principal compass points.

(2) Section lines and other legal boundaries.

(3) Zoning and land use within 0.5 miles.

(4) Haul routes to and from the facility, including load limits or other restrictions on those routes.

(5) Topography within 0.5 miles.

(6) Applicable setback distances and location requirements pursuant to rule 113.6(455B), including:

1. Airports within 6 miles of existing, new and planned MSWLF units.

2. Floodplains within or adjacent to the facility.

3. Wetlands within or adjacent to the facility.

4. Fault areas within 200 feet of existing, new and planned MSWLF units.

5. Seismic impact zones within or adjacent to the facility.

6. Unstable areas within or adjacent to the facility.

7. Location of threatened or endangered species within or adjacent to the facility.

8. Location of cultural resources within or adjacent to the facility.

9. Wells within 1,000 feet of upgradient existing, new and planned MSWLF units.

10. Community water systems within 1 mile of upgradient existing, new and planned MSWLF units.

11. Boundaries of the existing, new and planned MSWLF units and the facility property line.

12. Housing and sensitive populations within 500 feet of existing, new and planned MSWLF units.

f. The bird-aircraft hazard demonstration pursuant to paragraph 113.6(2)*"a,"* if applicable.

g. The floodplain demonstration pursuant to paragraph 113.6(2)*"b,"* if applicable.

h. The wetlands demonstration pursuant to paragraph 113.6(2)*"c,"* if applicable.

i. The fault area demonstration pursuant to paragraph 113.6(2)*"d,"* if applicable.

j. The seismic impact zone demonstration pursuant to paragraph 113.6(2)*"e,"* if applicable.

k. The unstable area demonstration pursuant to paragraph 113.6(2)*"f,"* if applicable.

l. The threatened or endangered flora and fauna demonstration pursuant to paragraph 113.6(2)*"g,"* if applicable.

m. The cultural resources demonstration pursuant to paragraph 113.6(2)*"h,"* if applicable.

n. Copies of written agreements with surrounding property owners pursuant to paragraph 113.6(2)*"l,"* if applicable.

o. The soil and hydrogeologic investigation description and analysis pursuant to paragraph 113.6(3)*"e."*