

Groundwater Corrective Action

Federal

§ 258.56 Assessment of corrective measures.

(a) Within 90 days of finding that any of the constituents listed in appendix II to this part have been detected at a statistically significant level exceeding the ground-water protection standards defined under §258.55 (h) or (i) of this part, the owner or operator must initiate an assessment of corrective measures. Such an assessment must be completed within a reasonable period of time.

(b) The owner or operator must continue to monitor in accordance with the assessment monitoring program as specified in §258.55.

(c) The assessment shall include an analysis of the effectiveness of potential corrective measures in meeting all of the requirements and objectives of the remedy as described under §258.57, addressing at least the following:

- (1) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;
 - (2) The time required to begin and complete the remedy;
 - (3) The costs of remedy implementation; and
 - (4) The institutional requirements such as State or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy(s).
- (d) The owner or operator must discuss the results of the corrective measures assessment, prior to the selection of remedy, in a public meeting with interested and affected parties.

§ 258.57 Selection of remedy.

(a) Based on the results of the corrective measures assessment conducted under §258.56, the owner or operator must select a remedy that, at a minimum, meets the standards listed in paragraph (b) of this section. The owner or operator must notify the State Director, within 14 days of selecting a remedy, a report describing the selected remedy has been placed in the operating record and how it meets the standards in paragraph (b) of this section.

(b) Remedies must:

- (1) Be protective of human health and the environment;
- (2) Attain the ground-water protection standard as specified pursuant to §§258.55 (h) or (i);

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

(4) Comply with standards for management of wastes as specified in §258.58(d).

(c) In selecting a remedy that meets the standards of §258.57(b), the owner or operator shall consider the following evaluation factors:

(1) The long- and short-term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on consideration of the following:

(i) Magnitude of reduction of existing risks;

(ii) Magnitude of residual risks in terms of likelihood of further releases due to waste remaining following implementation of a remedy;

(iii) The type and degree of long-term management required, including monitoring, operation, and maintenance;

(iv) Short-term risks that might be posed to the community, workers, or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and redisposal of containment;

(v) Time until full protection is achieved;

(vi) Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, redisposal, or containment;

(vii) Long-term reliability of the engineering and institutional controls; and

(viii) Potential need for replacement of the remedy.

(2) The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:

(i) The extent to which containment practices will reduce further releases;

(ii) The extent to which treatment technologies may be used.

(3) The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors:

(i) Degree of difficulty associated with constructing the technology;

(ii) Expected operational reliability of the technologies;

(iii) Need to coordinate with and obtain necessary approvals and permits from other agencies;

(iv) Availability of necessary equipment and specialists; and

(v) Available capacity and location of needed treatment, storage, and disposal services.

(4) Practicable capability of the owner or operator, including a consideration of the technical and economic capability.

(5) The degree to which community concerns are addressed by a potential remedy(s).

(d) The owner or operator shall specify as part of the selected remedy a schedule(s) for initiating and completing remedial activities. Such a schedule must require the initiation of remedial activities within a reasonable period of time taking into consideration the factors set forth in paragraphs (d) (1)–(8) of this section. The owner or operator must consider the following factors in determining the schedule of remedial activities:

(1) Extent and nature of contamination;

(2) Practical capabilities of remedial technologies in achieving compliance with ground-water protection standards established under §258.55 (g) or (h) and other objectives of the remedy;

(3) Availability of treatment or disposal capacity for wastes managed during implementation of the remedy;

(4) Desirability of utilizing technologies that are not currently available, but which may offer significant advantages over already available technologies in terms of effectiveness, reliability, safety, or ability to achieve remedial objectives;

(5) Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy;

(6) Resource value of the aquifer including:

(i) Current and future uses;

(ii) Proximity and withdrawal rate of users;

(iii) Ground-water quantity and quality;

(iv) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituent;

(v) The hydrogeologic characteristic of the facility and surrounding land;

(vi) Ground-water removal and treatment costs; and

(vii) The cost and availability of alternative water supplies.

(7) Practicable capability of the owner or operator.

(8) Other relevant factors.

(e) The Director of an approved State may determine that remediation of a release of an appendix II constituent from a MSWLF unit is not necessary if the owner or operator demonstrates to the satisfaction of the Director of the approved State that:

(1) The ground-water is additionally contaminated by substances that have originated from a source other than a MSWLF unit and those substances are present in concentrations such that cleanup of the release from the MSWLF unit would provide no significant reduction in risk to actual or potential receptors; or

(2) The constituent(s) is present in ground water that:

(i) Is not currently or reasonably expected to be a source of drinking water; and

(ii) Is not hydraulically connected with waters to which the hazardous constituents are migrating or are likely to migrate in a concentration(s) that would exceed the ground-water protection standards established under §258.55 (h) or (i); or

(3) Remediation of the release(s) is technically impracticable; or

(4) Remediation results in unacceptable cross-media impacts.

(f) A determination by the Director of an approved State pursuant to paragraph (e) of this section shall not affect the authority of the State to require the owner or operator to undertake source control measures or other measures that may be necessary to eliminate or minimize further releases to the ground-water, to prevent exposure to the ground-water, or to remediate the ground-water to concentrations that are technically practicable and significantly reduce threats to human health or the environment.

§ 258.58 Implementation of the corrective action program.

(a) Based on the schedule established under §258.57(d) for initiation and completion of remedial activities the owner/operator must:

(1) Establish and implement a corrective action ground-water monitoring program that:

(i) At a minimum, meet the requirements of an assessment monitoring program under §258.55;

(ii) Indicate the effectiveness of the corrective action remedy; and

(iii) Demonstrate compliance with ground-water protection standard pursuant to paragraph (e) of this section.

(2) Implement the corrective action remedy selected under §258.57; and

(3) Take any interim measures necessary to ensure the protection of human health and the environment. Interim measures should, to the greatest extent practicable, be consistent with the objectives of and contribute to the performance of any remedy that may be

required pursuant to §258.57. The following factors must be considered by an owner or operator in determining whether interim measures are necessary:

- (i) Time required to develop and implement a final remedy;
- (ii) Actual or potential exposure of nearby populations or environmental receptors to hazardous constituents;
- (iii) Actual or potential contamination of drinking water supplies or sensitive ecosystems;
- (iv) Further degradation of the ground-water that may occur if remedial action is not initiated expeditiously;
- (v) Weather conditions that may cause hazardous constituents to migrate or be released;
- (vi) Risks of fire or explosion, or potential for exposure to hazardous constituents as a result of an accident or failure of a container or handling system; and
- (vii) Other situations that may pose threats to human health and the environment.

(b) An owner or operator may determine, based on information developed after implementation of the remedy has begun or other information, that compliance with requirements of §258.57(b) are not being achieved through the remedy selected. In such cases, the owner or operator must implement other methods or techniques that could practicably achieve compliance with the requirements, unless the owner or operator makes the determination under §258.58(c).

(c) If the owner or operator determines that compliance with requirements under §258.57(b) cannot be practically achieved with any currently available methods, the owner or operator must:

(1) Obtain certification of a qualified ground-water scientist or approval by the Director of an approved State that compliance with requirements under §258.57(b) cannot be practically achieved with any currently available methods;

(2) Implement alternate measures to control exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment; and

(3) Implement alternate measures for control of the sources of contamination, or for removal or decontamination of equipment, units, devices, or structures that are:

- (i) Technically practicable; and
- (ii) Consistent with the overall objective of the remedy.

(4) Notify the State Director within 14 days that a report justifying the alternative measures prior to implementing the alternative measures has been placed in the operating record.

(d) All solid wastes that are managed pursuant to a remedy required under §258.57, or an interim measure required under §258.58(a)(3), shall be managed in a manner:

(1) That is protective of human health and the environment; and

(2) That complies with applicable RCRA requirements.

(e) Remedies selected pursuant to §258.57 shall be considered complete when:

(1) The owner or operator complies with the ground-water protection standards established under §§258.55(h) or (i) at all points within the plume of contamination that lie beyond the ground-water monitoring well system established under §258.51(a).

(2) Compliance with the ground-water protection standards established under §§258.55(h) or (i) has been achieved by demonstrating that concentrations of appendix II constituents have not exceeded the ground-water protection standard(s) for a period of three consecutive years using the statistical procedures and performance standards in §258.53(g) and (h). The Director of an approved State may specify an alternative length of time during which the owner or operator must demonstrate that concentrations of appendix II constituents have not exceeded the ground-water protection standard(s) taking into consideration:

(i) Extent and concentration of the release(s);

(ii) Behavior characteristics of the hazardous constituents in the ground-water;

(iii) Accuracy of monitoring or modeling techniques, including any seasonal, meteorological, or other environmental variabilities that may affect the accuracy; and

(iv) Characteristics of the ground-water.

(3) All actions required to complete the remedy have been satisfied.

(f) Upon completion of the remedy, the owner or operator must notify the State Director within 14 days that a certification that the remedy has been completed in compliance with the requirements of §258.58(e) has been placed in the operating record. The certification must be signed by the owner or operator and by a qualified ground-water scientist or approved by the Director of an approved State.

(g) When, upon completion of the certification, the owner or operator determines that the corrective action remedy has been completed in accordance with the requirements under paragraph (e) of this section, the owner or operator shall be released from the requirements for financial assurance for corrective action under §258.73.

§ 258.59 [Reserved]

Illinois

Section 811.324 Corrective Action Measures for MSWLF Units

a) The owner or operator shall initiate an assessment of corrective action measures within 14 days of the following:

- 1) The groundwater impact assessment, performed in accordance with subsection 811.319 (c), indicates that remedial action is needed; or

- 2) The assessment monitoring, performed in accordance with subsection 811.319(b), indicates that a confirmed increase above the applicable groundwater quality standards of Section 811.320 is attributable to the solid waste disposal facility.
- b) The owner or operator shall complete the corrective action assessment within 90 days of initiating the assessment of corrective action measures in accordance with subsection (a).
- c) The owner or operator shall continue to monitor in accordance with the assessment monitoring program, as specified in Section 811.319(b).
- d) The assessment shall include an analysis of the effectiveness of various potential corrective action measures in meeting all of the requirements and objectives of the remedy, as described under Section 811.325, addressing at least the following:
 - 1) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;
 - 2) The time required to begin and complete the remedy;
 - 3) The costs of remedy implementation; and
 - 4) The institutional requirements, such as State or local permit requirements or other environmental or public health requirements, that may substantially affect implementation of the remedies.
- e) The owner or operator must discuss the results of the corrective action measures assessment prior to the selection of a remedy in a public meeting with interested and affected parties. Prior to the public meeting, the owner or operator of the MSWLF unit shall submit to the Agency a report describing the results of the corrective action measures assessment.

BOARD NOTE: Requirements of this Section are derived from 40 CFR 258.56 (1992).

(Source: Added in R93-10 at 18 Ill. Reg. 1308, effective January 13, 1994)

Section 811.325 Selection of remedy for MSWLF Units

- a) Within 90 days of the completion of the corrective action measures assessment conducted under Section 811.324, the owner or operator of a MSWLF unit shall:
 - 1) Select a remedy based on the assessment results that, at a minimum, meets the requirements of subsection (b); and
 - 2) Submit to the Agency an application for a significant modification to the landfill permit describing the selected remedy and how it meets the standards set forth in subsection (b).
- b) Remedies selected under this Section must meet the following requirements:
 - 1) They must be protective of human health and the environment;
 - 2) They must attain the groundwater quality standards prescribed at Section 811.320;
 - 3) They must control the sources of release so as to reduce or eliminate, to the maximum extent practicable, further releases of constituents detected under the assessment monitoring into the environment that may pose a threat to human health or the environment; and
 - 4) They must comply with standards for management of wastes as specified in

Section 811.326(d).

- c) In selecting a remedy that meets the requirements of subsection (b), the owner or operator shall consider the following evaluation factors:
- 1) The long- and short-term effectiveness and protectiveness of the potential remedies, along with the degree of certainty that the remedy will prove successful based on consideration of the following factors:
 - A) The magnitude of reduction of existing risks;
 - B) The magnitude of residual risks in terms of likelihood of further releases due to waste remaining following implementation of a remedy;
 - C) The type and degree of long-term management required, including monitoring, operation, and maintenance;
 - D) Any short-term risks that might be posed to the community, workers, or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and redisposal or containment;
 - E) The length of time until full protection is achieved;
 - F) Any potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, redisposal, or containment;
 - G) The long-term reliability of engineering and institutional controls; and
 - H) The potential need for replacement of the remedy.
 - 2) The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:
 - A) The extent to which containment practices will reduce further releases; and
 - B) The extent to which treatment technologies may be used.
 - 3) The ease or difficulty of implementing potential remedies based on consideration of the following types of factors:
 - A) The degree of difficulty associated with constructing the technology;
 - B) The expected operational reliability of the technologies;
 - C) The need to coordinate with and obtain necessary approvals and permits from other agencies;
 - D) The availability of necessary equipment and specialists; and
 - E) The available capacity and location of needed treatment, storage, and disposal services.
 - 4) The practicable capability of the owner or operator to implement the remedies, including a consideration of the technical and economic capability.
 - 5) The degree to which community concerns are addressed by potential remedies.
- d) Schedule for implementing remedial action.
- 1) The owner or operator shall specify as part of the selected remedy a schedule(s) for initiating and completing remedial activities. Such a schedule must require the initiation of remedial activities within a reasonable period of

time, taking into consideration the factors set forth in subsections (d)(3)(A) through (d)(3)(H).

- 2) The Agency shall specify the time period for initiating remedial action in the facility's permit.
- 3) The owner or operator shall consider the following factors in determining the schedule of remedial activities:
 - A) The extent and nature of contamination;
 - B) The practical capabilities of remedial technologies in achieving compliance with the groundwater quality standards established under Section 811.320 and other objectives of the remedy;
 - C) The availability of treatment or disposal capacity for wastes managed during implementation of the remedy;
 - D) The desirability of utilizing technologies that are not currently available, but which may offer significant advantages over already available technologies in terms of effectiveness, reliability, safety, or ability to achieve remedial objectives;
 - E) Any potential risks to human health and the environment from exposure to contamination prior to completion of the remedy;
 - F) Any resource value of the aquifer including:
 - i) Any current and future uses;
 - ii) The proximity and withdrawal rate of users;
 - iii) The ground-water quantity and quality;
 - iv) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituent;
 - v) The hydrogeologic characteristic of the facility and surrounding land;
 - vi) The ground-water removal and treatment costs;
 - vii) The cost and availability of alternative water supplies;
 - G) The practicable capability of the owner or operator to implement the remedies; and
 - H) Any other relevant factors.
- e) The Agency shall determine that remediation of a release of one or more constituents monitored in accordance with Section 811.319 from a MSWLF unit is not necessary if the owner or operator demonstrates to the Agency that:
 - 1) The groundwater is additionally contaminated by substances that have originated from a source other than the MSWLF unit and those substances are present in such concentrations that cleanup of the release from the MSWLF unit would provide no significant reduction in risk to actual or potential receptors; or
 - 2) The constituents are present in groundwater that:
 - A) Is not currently or reasonably expected to be a source of drinking water; and
 - B) Is not hydraulically connected with waters to which the hazardous constituents are migrating or are likely to migrate in concentrations that would exceed the groundwater quality standards established under Section 811.320; or

- 3) The remediation of the release is technically impracticable; or
 - 4) The remediation results in unacceptable cross-media impacts.
- f) A determination by the Agency pursuant to subsection (e) shall not affect the Agency's authority to require the owner or operator to undertake source control measures or other measures that may be necessary to eliminate or minimize further releases to the groundwater, to prevent exposure to the groundwater, or to remediate the groundwater to concentrations that are technically practicable and which reduce threats to human health or the environment.

BOARD NOTE: The requirements of this Section are derived from 40 CFR 258.57 (1992).

(Source: Added in R93-10 at 18 Ill. Reg. 1308, effective January 13, 1994)

Section 811.326 Implementation of the corrective action program at MSWLF Units

- a) Based on the schedule established under section 811.325(d) for initiation and completion of corrective action, the owner or operator shall:
- 1) Establish and implement a corrective action groundwater monitoring program that:
 - A) At a minimum, meets the requirements of an assessment monitoring program under Section 811.319(b);
 - B) Indicates the effectiveness of the remedy; and
 - C) Demonstrates compliance with ground-water protection standard pursuant to subsection (e) of this Section.
 - 2) Implement the remedy selected pursuant to Section 811.325.
 - 3) Take any interim measures necessary to ensure the protection of human health and the environment. The interim measures should, to the greatest extent practicable, be consistent with the objectives of and contribute to the performance of any remedy that may be required pursuant to Section 811.325. The owner or operator shall consider the following factors in determining whether interim measures are necessary:
 - A) The time required to develop and implement a final remedy;
 - B) Any actual or potential exposure of nearby populations or environmental receptors to hazardous constituents;
 - C) Any actual or potential contamination of drinking water supplies or sensitive ecosystems;
 - D) Any further degradation of the groundwater that may occur if remedial action is not initiated expeditiously;
 - E) The weather conditions that may cause hazardous constituents to migrate or be released;
 - F) Any risks of fire or explosion, or potential for exposure to hazardous constituents as a result of an accident or failure of a container or handling system; and
 - G) Any other situations that may pose threats to human health and the environment.
- b) If an owner or operator determines, based on information developed after implementation of the remedy has begun or other information, that compliance with

requirements of Section 811.325(b) are not being achieved through the remedy selected, the owner or operator shall:

- 1) Implement other methods or techniques that could practicably achieve compliance with the requirements, unless the owner or operator makes the determination under subsection (c) of this Section.
 - 2) Submit to the Agency, prior to implementing any alternative methods pursuant to subsection (b)(1), an application for a significant modification to the permit describing the alternative methods or techniques and how they meet the standards of Section 811.325(b).
- c) If the owner or operator determines that compliance with the requirements of Section 811.325(b) cannot be practically achieved with any currently available methods, the owner or operator shall:
- 1) Obtain the certification of a qualified groundwater scientist or a determination by the Agency that compliance with requirements under Section 811.325(b) cannot be practically achieved with any currently available methods.
 - 2) Implement alternative measures to control exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment.
 - 3) Implement alternative measures for control of the sources of contamination, or for removal or decontamination of equipment, units, devices, or structures that are:
 - A) Technically practicable; and
 - B) Consistent with the overall objective of the remedy.
 - 4) Submit to the Agency, prior to implementing the alternative measures in accordance with subsection (c), an application for a significant modification to the permit justifying the alternative measures.
 - 5) For purposes of this Section, a "qualified groundwater scientist" is a scientist or an engineer who has received a baccalaureate or postgraduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields as may be demonstrated by state registration, professional certifications, or completion of accredited university programs that enable that individual to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action.
- d) All solid wastes that are managed pursuant to a remedy required under Section 811.325, or pursuant to an interim measure required under subsection (a)(3), shall be managed by the owner or operator in a manner:
- 1) That is protective of human health and the environment; and
 - 2) That complies with applicable requirements of Part 811.
- e) Remedies selected pursuant to Section 811.325 shall be considered complete when:
- 1) The owner or operator complies with the groundwater quality standards established under Section 811.320 at all points within the plume of contamination that lie beyond the zone of attenuation established pursuant to Section 811.320;
 - 2) Compliance with the groundwater quality standards established under Section

811.320 has been achieved by demonstrating that concentrations of the constituents monitored under the assessment monitoring program under Section 811.319(b) have not exceeded the groundwater quality standards for a period of three consecutive years using the statistical procedures and performance standards in Section 811.320(e). The Agency may specify an alternative time period during which the owner or operator must demonstrate compliance with the groundwater quality standard(s). The Agency shall specify such an alternative time period by considering the following factors:

- A) The extent and concentration of the release(s);
- B) The behavior characteristics of the hazardous constituents in the ground-water;
- C) The accuracy of monitoring or modeling techniques, including any seasonal, meteorological, or other environmental variabilities that may affect the accuracy; and
- D) The characteristics of the ground-water; and

3) All actions required to complete the remedy have been satisfied.

f) Within 14 days of the completion of the remedy, the owner or operator shall submit to the Agency an application for a significant modification of the permit including a certification that the remedy has been completed in compliance with the requirements of subsection (e). The certification must be signed by the owner or operator and by a qualified groundwater scientist.

g) Upon Agency review and approval of the certification that the corrective action has been completed, in accordance with subsection (e), the Agency shall release the owner or operator from the financial assurance requirements for corrective action pursuant to Subpart G of this Part.

BOARD NOTE: Requirements of this Section are derived from 40 CFR 258.58 (1992).

(Source: Added in R93-10 at 18 Ill. Reg. 1308, effective January 13, 1994)

Kansas

28-29-114. Corrective action.

(a) Assessment of corrective measures.

(1) After consideration of the results from the release assessment conducted pursuant to K.A.R. 28-29-113(a)(3)(B), the owner or operator may be asked by the director to conduct an assessment of corrective measures that includes an analysis of:

- (A) performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;
- (B) time required to begin and complete the remedy,
- (C) costs of remedy implementation; and
- (D) institutional requirements such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy or remedies.

(2) The owner or operator shall continue to monitor in accordance with the assessment monitoring program as specified in K.A.R. 28-29-113(b).

(3) The owner or operator shall make a recommendation for one of the corrective

measures assessed and include a rationale for the choice in the corrective measures assessment report.

(4) The owner or operator shall conduct a public hearing to discuss the range of corrective measures evaluated, the recommended corrective measures, and the rationale outlined in the assessment report.

(b) Remedy.

(1) After consideration of the results of the corrective measures assessment and the public comments received, the owner or operator shall propose a remedy and a schedule for implementation to the department for approval. The remedy shall:

- (A) be protective of human health and the environment;
- (B) attain the groundwater protection standards;
- (C) control the source or sources of releases, so as to reduce or eliminate, to the maximum extent practicable, further releases of constituents identified in appendix II of K.A.R. 28-29-113 into the environment that may pose a threat to human health or the environment; and
- (D) comply with standards for management of wastes as specified in paragraph (c)(4) of this regulation.

(2) In approving a remedy, the following evaluation factors shall be considered by the director:

- (A) the long-term and short-term effectiveness and protectiveness of the potential remedy or remedies, along with the degree of certainty that the remedy will prove successful;
- (B) the effectiveness of the remedy in controlling the source to reduce further releases;
- (C) the ease or difficulty of implementing a potential remedy or remedies;
- (D) practicable capability of the owner or operator, including a consideration of the technical and economic capability; and
- (E) the degree to which community concerns are addressed by a potential remedy or remedies.

(3) A remedy other than that proposed by the owner or operator may be specified by the director.

(4) It may be determined by the director that remediation of a release of a constituent identified in appendix II of K.A.R. 28-29-113 from a MSWLF unit is not necessary if the owner or operator demonstrates to the satisfaction of the director any one of the following:

- (A) the groundwater is additionally contaminated by substances that have originated from a source other than a MSWLF unit and those substances are present in concentrations such that cleanup of the release from the MSWLF unit would provide no significant reduction in risk to public, health and the environment;
- (B) remediation of the release or releases is technically impracticable; or
- (C) remediation results in unacceptable cross-media impacts.

(5) A determination by the director that remediation is not necessary shall not affect the authority of the department to require the owner or operator to undertake source control measures or other measures that may be necessary to eliminate or minimize further releases to the groundwater, to prevent exposure to the groundwater, or to remediate the groundwater to concentrations that are technically practicable and

significantly reduce threats to human health or the environment.

(6) The owner or operator may be required by the director to take any interim measures necessary to ensure the protection of human health and the environment. Interim measures shall, to the greatest extent practicable, be consistent with the objectives of and contribute to the performance of any remedy selected.

(c) Implementation of the corrective action program.

(1) Based on the schedule established under paragraph (b)(1) above, the owner or operator shall implement the corrective action remedy selected under subsection (b).

(2) An owner or operator or the director may determine, based on information developed after implementation of the remedy has begun or other information, that compliance with requirements of paragraph (b)(1) is not being achieved through the remedy selected. In such cases, the owner or operator shall implement other methods or techniques that practicably achieve compliance with the requirements.

(3) If the owner or operator or director determines that compliance with requirements under paragraph (b)(1) cannot be practically achieved with any currently available methods, the owner or operator shall:

(A) obtain certification of a qualified groundwater scientist that compliance cannot be practically achieved with any currently available methods;

(B) implement alternate measures to control exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment;

(C) implement alternate measures for control of the sources of contamination, or for removal or decontamination of equipment, units, devices, or structures; and

(D) submit a report to the director justifying the alternative measures prior to implementing the alternative measures.

(4) Each solid waste that is managed pursuant to a remedy or an interim measure shall be managed in accordance with Kansas waste management standards.

(5) Remedies selected pursuant to subsection (b) shall be considered complete when:

(A) the owner or operator complies with the groundwater protection standards, established under K.A.R. 28-29-113(b)(13) at the point of compliance;

(B) compliance with the groundwater protection standards has been achieved by demonstrating that concentrations of constituents identified in appendix II of K.A.R. 28-29-113 have not exceeded the groundwater protection standard or standards for a period of three consecutive years using the statistical procedures and performance standards in K.A.R. 28-29-112. An alternative length of time during which the owner or operator shall demonstrate that concentrations of constituents identified in appendix II of K.A.R. 28-29-113 have not exceeded the groundwater protection standard or standards may be specified by the director, taking into consideration the:

(i) extent and concentration of the release or releases;

(ii) behavior characteristics of the contaminants in the groundwater;

(iii) accuracy of monitoring or modeling techniques, including any seasonal, meteorological, or other environmental variabilities that may affect the accuracy; and

(iv) characteristics of the groundwater; and

(C) all actions required to complete the remedy have been satisfied.

(6) Upon completion of the remedy, the owner or operator shall submit to the director a

copy of a certification that the remedy has been completed in compliance with the requirements of paragraph (b)(1) and initiate a detection monitoring plan. The certification shall be signed by the owner or operator and by a qualified groundwater scientist.

(7) Upon receipt of the certification, if the director determines that the corrective action remedy has been completed in accordance with the requirements of this section, the owner or operator shall be released from the requirements for financial assurance for corrective action under K.A.R. 28-29-122. Where appropriate and necessary, a new schedule for continued detection monitoring shall be established by the director.

(Authorized by K.S.A. 1993 Supp. 65-3406; implementing K.S.A. 65-3401; effective Oct. 24, 1994.)

Minnesota

7035.2615 CONTINGENCY ACTION PLAN.

Subpart 1. **General requirements.** An owner or operator must prepare and maintain a contingency action plan at the solid waste management facility. The contingency action plan must identify occurrences that would endanger human health and the environment and must establish procedures that would minimize hazards to human health and the environment. The contingency action plan must contain the information in subpart 3 and the contingency requirements for the particular facility.

Subp. 2. **Implementation of plan.** Within the period specified in the approved contingency action plan, the owner or operator must implement the provisions of the plan that would minimize the adverse effects to human health or the environment from vandalism, fires, explosions, failure or collapse of artificial or natural dikes, or liners, water quality violations, surface drainage problems, air emission violations, and other releases.

Subp. 3. **Content of contingency action plan.** The contingency action plan must contain the following:

- A. an identification of the possible events that may require corrective actions such as violations of intervention limits or water quality standards, failure of design features, settlement of completed areas, and surface drainage problems;
- B. a description of the actions, the sequence and the timetable in which they will be taken, and the costs associated with each corrective action;
- C. the equipment needed to repair each condition and the on-site and off-site availability of the equipment;
- D. any prior arrangements with contractors;
- E. scheduled and unscheduled down times for maintenance at the facility; and
- F. an estimated cost for each action, for the most severe action that may be needed, and all actions.

Subp. 4. **Amendment of contingency action plan.** The owner or operator must review and amend the contingency action plan whenever:

- A. the solid waste management facility permit is reissued;
- B. a failure or release occurs for which the plan did not provide an appropriate response;
or
- C. the design, construction, operation, or maintenance of the solid waste management facility changes so that the response needed to a failure or release changes.

Subp. 5. **Copies of contingency action plan.** A copy of the contingency action plan and revisions to the plan must be submitted to the commissioner with the permit application. After modification or approval, compliance with the plan must be a condition of any permit issued, and the plan must be retained at the solid waste management facility.

STAT AUTH: MS s [115.03](#) subd 1; [116.07](#) subds 2,4,4g,4h

HIST: 13 SR 1150

Current as of 03/16/04

Subp. 15. **Contingency action.** The owner or operator must implement the actions necessary to repair site features or to control, recover, or treat polluted ground or surface waters and explosive or toxic gases. The actions must include the measures dictated by the situation and outlined in the contingency action plan developed under part [7035.2615](#). The contingency action plan developed under part [7035.2615](#) must include the repair of clogged collection systems, repair of monitoring wells or probes, repair of cover systems, and the repair of liners or holding areas. If the contingency action plan did not anticipate the level of effort required to protect human health and the environment, actions to bring the facility into compliance with parts [7035.2525](#) to [7035.2805](#) must include any necessary work beyond that identified in the contingency action plan.

Missouri

(12) Corrective Action.

(A) Assessment of Corrective Measures.

1. Within ninety (90) days of finding that any of the constituents listed in Appendix II of this rule have been detected at a statistically significant level exceeding the groundwater protection standards defined under subparagraph (11)(C)6.E. of this rule, the owner/operator shall initiate an assessment of corrective measures. This assessment shall be completed within a reasonable period of time, and a report describing the assessment of corrective measures shall be submitted to the department.
2. The owner/operator shall continue to monitor in accordance with the assessment monitoring program as specified in subparagraph (11)(C)6.F. of this rule.
3. The assessment shall include an analysis of the effectiveness of potential corrective measures in meeting all of the requirements and objectives of the

remedy as described under subsection (12)(B) of this rule, addressing at least the following:

- A. The performance, reliability, ease of implementation and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts and control of exposure to any residual contamination;
 - B. The time required to begin and complete the remedy;
 - C. The costs of remedy implementation; and
 - D. The institutional requirements such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy(ies).
4. The owner/operator shall discuss the results of the corrective measures assessment, prior to the selection of remedy, in a public meeting with interested and affected parties.

(B) Selection of Remedy.

1. Based on the results of the corrective measures assessment conducted under subsection (12)(A) of this rule the owner/operator shall propose a remedy that, at a minimum, meets the standards listed in paragraph (12)(B)2. of this rule. The owner/operator shall submit to the department, within fourteen (14) days of selecting a proposed remedy, a report describing the proposed remedy and shall place a copy of the report in the operating record that describes how the proposed remedy meets the standards in paragraph (12)(B)2. of this rule.

2. Remedies shall.

- A. Be protective of the public health and the environment;
- B. Attain the groundwater protection standard as specified pursuant to subparagraph (11)(C)6.E. of this rule;
- C. Control the source(s) of releases so as to reduce or eliminate, to the maximum extent practicable, further releases of constituents listed in Appendix II of this rule into the environment that may pose a threat to human health or the environment; and
- D. Comply with standards for management of wastes as specified in paragraph (12)(C)4.

3. In proposing a remedy that meets the standards of paragraph (12)(B)2. of this rule, the owner/operator, and, in approving a remedy, the department shall consider the following evaluation factors:

- A. The long- and short-term effectiveness and protectiveness of the potential remedy, along with the degree of certainty that the remedy will prove successful based on consideration of the following:
 - (I) Magnitude of reduction of existing risks;
 - (II) Magnitude of residual risks in terms of likelihood of further releases due to waste remaining following implementation of the proposed remedy;
 - (III) The type and degree of long-term management required, including monitoring, operation and maintenance;
 - (IV) Short-term risks that might be posed to the community, workers or the environment during implementation of the remedy, including potential threats to human health and the environment associated with excavation, transportation and redisposal or containment;

- (V) Time until full protection is achieved;
 - (VI) Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, redispersion or containment;
 - (VII) Long-term reliability of the engineering and institutional controls; and
 - (VIII) Potential need for replacement of the remedy;
- B. The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:
- (I) The extent to which containment practices will reduce further releases; and
 - (II) The extent to which treatment technologies may be used;
- C. The ease or difficulty of implementing the potential remedy(ies) based on consideration of the following types of factors:
- (I) Degree of difficulty associated with constructing the remedy technology;
 - (II) Expected operational reliability of the proposed technologies;
 - (III) Need to coordinate with and obtain necessary approvals and permits from other agencies;
 - (IV) Availability of necessary equipment and specialists; and
 - (V) Available capacity and location of needed treatment, storage and disposal services; and
- D. The degree to which community concerns are addressed by the proposed remedy(ies).
4. The owner/operator shall specify as part of the proposed remedy a schedule(s) for initiating and completing remedial activities. This schedule shall require the initiation of remedial activities within a reasonable period of time taking into consideration the factors set forth in subparagraphs (12)(D)4.A. through H. of this rule. The owner/operator shall consider the following factors in determining, and the department will consider the following factors in approving, the schedule of remedial activities:
- A. Extent and nature of contamination;
 - B. Practical capabilities of remedial technologies in achieving compliance with groundwater protection standards established under subparagraph (11)(C)6.E. of this rule and other objectives of the remedy;
 - C. Availability of treatment or disposal capacity for wastes managed during implementation of the remedy;
 - D. Desirability of utilizing technologies that are not currently available, but which may offer significant advantages over already available technologies in terms of effectiveness, reliability, safety or ability to achieve remedial objectives;
 - E. Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy;
 - F. Resource value of any affected aquifer including:
 - (I) Current and future uses;
 - (II) Proximity and withdrawal rate of users;
 - (III) Groundwater quantity and quality;
 - (IV) The potential damage to wildlife, crops, vegetation and physical

structures caused by exposure to the waste constituent;

(V) The hydrogeologic characteristic of the facility and surrounding land;

(VI) Groundwater removal and treatment costs; and

(VII) The cost and availability of alternative water supplies;

G. Practicable capability of the owner/operator; and

H. Other relevant factors.

5. The department may determine that remediation of a release of any constituent listed in Appendix II of this rule from a sanitary landfill is not necessary if the owner/operator demonstrates to the satisfaction of the department that.

A. The groundwater is additionally contaminated by substances that have originated from a source other than a sanitary landfill and those substances are present in concentrations such that cleanup of the release from the sanitary landfill unit would provide no significant reduction in risk to actual or potential receptors;

B. The constituent(s) is present in groundwater that.

(I) Is not a current or potential source of drinking water; and

(II) Is not hydraulically connected with waters to which the hazardous constituents are migrating or are likely to migrate in a concentration(s) that represents a statistically significant increase over background concentrations;

C. Remediation of the release(s) is technically impracticable; or

D. Remediation would result in unacceptable cross-media impacts.

6. A determination by the department pursuant to paragraph (12)(B)5. of this rule shall not affect the authority of the state to require the owner/operator to undertake source control measures or other measures that may be necessary to eliminate or minimize further releases to the groundwater, to prevent exposure to the groundwater, or to remediate the groundwater to concentrations that are technically practicable and which significantly reduce threats to human health or the environment.

(C) Implementation of the Corrective Action Program.

1. Based on the schedule established under paragraph (12)(B)4. of this rule for initiation and completion of remedial activities the owner/operator shall.

A. Establish and implement a corrective action groundwater monitoring program that.

(I) At a minimum, meets the requirements of an assessment monitoring program under paragraph (11)(C)6. of this rule;

(II) Indicates the effectiveness of the corrective action remedy; and

(III) Demonstrates compliance with groundwater protection standard pursuant to subparagraph (11)(C)6.E. of this rule.

B. Implement the corrective action remedy selected under subsection (12)(B) of this rule; and

C. Take any interim measures necessary, any measures determined to be necessary by the department, or both, to ensure the protection of human health and the environment. Interim measures shall, to the greatest extent practicable, be consistent with the objectives of and contribute to the performance of any remedy that may be required pursuant to subsection (12)(B) of this rule. The following factors shall be considered by an owner/operator, and will be considered by the

department, in determining whether interim measures are necessary:

- (I) Time required to develop and implement a final remedy;
- (II) Actual or potential exposure of nearby populations or environmental receptors to hazardous constituents;
- (III) Actual or potential contamination of drinking water supplies or sensitive ecosystems;
- (IV) Further degradation of the groundwater that may occur if remedial action is not initiated expeditiously;
- (V) Weather conditions that may cause hazardous constituents to migrate or be released;
- (VI) Risks of fire or explosion, or potential for exposure to hazardous constituents as a result of an accident or failure of a container or handling system; and
- (VII) Other situations that may pose threats to human health and the environment.

2. The department may determine, based on information developed after implementation of the remedy has begun or other information, that compliance with requirements of paragraph (12)(B)2. of this rule are not being achieved through the remedy selected. In those cases, the owner/operator shall implement other methods or techniques that will achieve compliance with the requirements, unless the department makes the determination under paragraph (12)(C)3. of this rule.

3. If the department determines that compliance with requirements under paragraph (12)(B)2. of this rule cannot be practically achieved with any currently available methods, the owner/operator shall.

A. Obtain the certification of a qualified groundwater scientist and approval from the department that compliance with the requirements under paragraph (12)(B)2. cannot be practically achieved with any currently available methods;

B. Implement alternative measures to control exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment;

C. Implement alternative measures for control of the sources of contamination, or for removal or decontamination of equipment, units, devices or structures that are.

(I) Technically practicable; and

(II) Consistent with the overall objective of the remedy; and

D. Submit a report to the department justifying the alternative measures. The alternative measures must be approved by the department prior to implementation.

4. All solid wastes that are managed pursuant to a remedy required under subsection (12)(C) or an interim measure required under subparagraph (12)(C)1.C. of this rule, shall be managed in a manner.

A. That is protective of the public health and the environment; and

B. That complies with all applicable state and federal requirements.

5. Remedies selected pursuant to subsection (12)(B) of this rule shall be considered complete when.

- A. The owner/operator complies with the groundwater protection standards established under subparagraph (11)(C)6.E. of this rule at all points within the plume of contamination;
- B. Compliance with the groundwater protection standards established under subparagraph (11)(C)6.E. of this rule has been achieved by demonstrating that concentrations of all constituents listed in Appendix II of this rule have not exceeded the groundwater protection standard(s) for a period of three (3) consecutive years using the statistical procedures and performance standards in subsection (11)(C). The department may specify an alternative length of time during which the owner/operator shall demonstrate that concentrations of all constituents listed in Appendix II of this rule have not exceeded the groundwater protection standard(s) taking into consideration.
- (I) Extent and concentration of the release(s);
 - (II) Behavioral characteristics of the hazardous constituents in the groundwater;
 - (III) Accuracy of monitoring or modeling techniques, including any seasonal meteorological, or other environmental variabilities that may affect the accuracy; and
 - (IV) Characteristics of the groundwater; and
- C. All actions required to complete the remedy have been completed.
6. Upon completion of the remedy, the owner/operator shall submit a certification to the department within fourteen (14) days after the remedy has been completed in compliance with the requirements of paragraph (12)(C)5. and shall place a copy of the certification in the facility's operating record. The certification shall be signed by the owner/operator and by a qualified groundwater scientist and approved by the department.
7. When, upon completion of the certification, the owner/operator and the department determines that the corrective action remedy has been completed in accordance with the requirements under paragraph (12)(C)5. of this rule, the owner/operator shall be released from the requirements for financial assurance for corrective action under 10 CSR 80-2.030(4)(C).

Nebraska

006 Assessment of Remedial Measures.

006.01 If a constituent listed in Appendix II is detected at a statistically significant level exceeding the ground water protection standards defined in 005.08 and 005.09 of this chapter, the owner or operator shall begin remedial action in accordance with Title 118 - Ground Water Quality Standards and Use Classification.

006.02 An owner or operator shall continue to monitor in accordance with the monitoring program specified in 005 of this chapter.

North Dakota

33-20-13-05. Assessment monitoring, remedial measures, and corrective action.

1. Within ninety days of finding that a parameter has been detected at a statistically significant level exceeding the ground water standards established under sections 33-20-13-02 and 33-20-13-03, the owner or operator shall initiate an assessment of remedial measures. The assessment must:
 - a) Be completed within a reasonable time period, unless otherwise specified by permit or the department;
 - b) Include an evaluation of the nature and extent of the release of the constituents including pathways to human and environmental receptors;
 - c) For municipal landfills, include ground water sampling and analysis for all parameters listed in appendix 1 of this chapter. The department may delete any of the appendix 1 parameters if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste within the leaking facility;
 - d) Include an analysis of the effectiveness of potential remedial measures in meeting all requirements of subsection 2 and include the following:
 - 1) The performance, reliability, ease of implementation, and potential impacts of each potential remedial measure;
 - 2) The time required to begin and complete each potential remedial measure;
 - 3) The costs of implementation of each potential remedial measure; and
 - 4) The permit requirements or other environmental or public health requirements that may substantially affect implementation of each potential remedial measure; and
 - 5) When requested by the department, the owner or operator must discuss results of the assessment of remedial measures, prior to selection of a corrective action remedy, in a public meeting with interested and affected persons.
2. Based on the results of the assessment of remedial measures conducted under subsection 1, the owner or operator must select a corrective action remedy within thirty days which, at minimum, meets the following standards:
 - a) Is protective of human health and environmental resources;
 - b) Attains the ground water protection standards under sections 33-20-13-02 and 33-20-13-03;
 - c) Controls the sources of release so as to reduce or eliminate, to the maximum extent practicable, further releases of constituents that may pose a threat to human health or environmental resources; and
 - d) Complies with this article and other applicable environmental statutes and rules.
3. When selecting a corrective action remedy under subsection 2, the owner or operator shall consider these factors:
 - a) The short-term and long-term effectiveness of the potential remedial measure considering:

- 1) Magnitude of reducing exposure to constituents;
 - 2) Likelihood of further releases;
 - 3) Practical capability of technologies; and
 - 4) Time until the standards are achieved.
 - b) The ease or difficulty of implementing the potential remedial measure considering:
 - 1) Availability of equipment and specialists;
 - 2) Long-term management needs such as monitoring, operation, and maintenance;and
 - 3) Need to coordinate with and obtain necessary approvals or permits from other agencies.
 - c) The need for interim measures to control the sources of the release and to protect human health and environmental resources.
 - d) The schedules for initiating, conducting, and completing the potential remedial measure.
 - e) Practical capability of the owner or operator.
4. The owner or operator shall provide the department with a document fully describing the remedial measures assessment under subsection 1 and the selected corrective action remedy under subsections 2 and 3.
5. Upon selection of the corrective action remedy under subsection 2 and with the concurrence of the department, the owner or operator shall establish and implement the remedy.
 - a) During implementation, the owner or operator shall monitor the effectiveness of the remedy.
 - b) Implementation shall be considered complete when all actions and standards required to complete the remedy have been satisfied and approved by the department.
 - c) Upon completion of a corrective action remedy, the owner or operator shall place in the operating record a certification that the corrective action remedy has been completed. Within fourteen days of completion of the certification, the owner or operator shall notify the department that the certification has been placed in the operating record.

History: Effective October 1, 1994; amended effective August 1, 1995.

General Authority: NDCC 23-29-04, 23-33-11, 61-28-04, 61-28-05

Law Implemented: NDCC 23-29-04, 23-33-02, 23-33-06, 23-33-08, 61-28-04

Appendix I to Section 33-20-13-05 - List of Hazardous
Inorganic and Organic Constituents

Acenaphthene	p-Chloroaniline
Acenaphtylene	Chlorobenzene
Acetone	Chlorobenzilate
Acetonitrile; Methyl cyanide	p-Chloro-m-cresol; 4-Chloro-3- methylphenol
Acetophenone	Chloroethane; Ethyl chloride
2-Acetylaminofluorene; 2-AAF	Chloroform; Trichloromethane
Acrolein	2-Chloronaphthalene
Acrylonitrile	2-Chlorophenol
Aldrin	4-Chlorophenyl phenyl ether
Allyl chloride	Chloroprene
4-Aminobiphenyl	Chromium
Anthracene	Chrysene
Antimony	Cobalt
Arsenic	Copper
Barium	m-Cresol; 3-methylphenol
Benzene	o-Cresol; 2-Methylphenol
Benzol [a] anthracene; Benzanthracene	p-Cresol; 4-Methylphenol
Benzo [b] fluoranthene	Cyanide
Benzo [k] fluoranthene	2,4-D; 2,4-Dichlorophenoxyacetic acid
Benzo [ghi] perylene	4,4 ¹ -DDD
Benzo [a] pyrene	4,4 ¹ -DDE
Benzyl alcohol	4,4 ¹ -DDT
Beryllium	Diallate
alpha-BHC	Dibenz [a,h] anthracene
beta-BHC	Dibenzofuran
delta-BHC	Dibromochloromethane; Chlorodibromomethane
gamma-BHC; Lindane	1,2-Dibromo-3-chloropropane; DBCP
Bis (2-chloroethoxy) methane	1,2-Dibromoethane; Ethylene dibromide; EDB
Bis (2-chloroethyl) ether; Dichloroethyl ether	Di-n-butyl phthalate
Bis- (2-chloro-1-methylethyl) ether; 2,2 ¹ -Dichlorodiisopropyl ether; DCIP	o-Dichlorobenzene; 1,2-Dichlorobenzene
Bis- (2-ethylhexyl) phthalate	m-Dichlorobenzene; 1,3-Dichlorobenzene
Bromochloromethane; Chloro- bromomethane	p-Dichlorobenzene; 1,4-Dichlorobenzene
Bromodichloromethane; Dibromochloromethane	3,3 ¹ -Dichlorobenzidine
Bromoform; Tribromomethane	trans-1,4-Dichloro-2-butene
4-Bromophenyl phenyl ether	Dichlorodifluoromethane; CFC 12
Butyl benzyl phthalate; Benzyl butyl phthalate	1,1-Dichloroethane; Ethyldidene chloride
Cadmium	1,2-Dichloroethane; Ethylene dichloride
Carbon disulfide	Hexachlorocyclopentadiene
Carbon tetrachloride	Hexachloroethane
Chlordane	Hexachloropropene
1,1-Dichloroethylene; 1,1-Dichloro- ethene; Vinylidene chloride	2-Hexanone; Methyl butyl ketone
cis-1,2-Dichloroethylene; cis-1,2- Dichloroethene	Indeno (1,2,3-cd) pyrene
trans-1,2-Dichloroethylene trans-1,2- Dichloroethene	Isobutyl alcohol
2,4-Dichlorophenol	Isodrin
2,6-Dichlorophenol	Isophorone
1,2-Dichloropropane; Propylene dichloride	Isosafrole
	Kepone

1,3-Dichloropropane; Trimethylene dichloride	Lead
2,2-Dichloropropane; Isopropylidene chloride	Mercury
1,1-Dichloropropene	Methacrylonitrile
cis-1,3-Dichloropropene	Methapyrilene
trans-1,3-Dichloropropene	Methoxychlor
Dieldrin	Methyl bromide; Bromomethane
Diethyl phthalate	Methyl chloride; Chloromethane
0,0-Diethyl 0-2-pyrazinyl phosphorothioate; Thionazin	3-Methylcholanthrene
Dimethoate	Methyl ethyl ketone; MEK; 2-Butanone
p-(Dimethylamino)azobenzene	Methyl iodide; Iodomethane
7,12-Dimethylbenz[a]anthracene	Methyl methacrylate
3,3 ¹ -Dimethylbenzidine	Methyl methanesulfonate
2,4-Dimethylphenol; m-Xylenol	2-Methylnaphthalene
Dimethyl phthalate	Methyl parathion; Parathion methyl
m-Dinitrobenzene	4-Methyl-2-pentanone; Methyl isobutyl ketone
4,6-Dinitro-o-cresol	Methylene bromide; Dibromomethane
4,6-Dinitro-2-methylphenol	Methylene chloride; Dichloromethane
2,4-Dinitrophenol	Naphthalene
2,4-Dinitrotoluene	1,4-Napthoquinone
2,6-Dinitrotoluene	1-Naphthylamine
Dinoseb; DMBP; 2-sec-Butyl-4,6-dinitrophenol	2-Naphthylamine
Di-n-octyl phthalate	Nickel
Diphenylamine	o-Nitroaniline; 2-Nitroaniline
Disulfoton	m-Nitroaniline; 3-Nitroaniline
Endosulfan I	p-nitroaniline; 4-Nitroaniline
Endosulfan II	Nitrobenzene
Endosulfan sulfate	o-Nitrophenol; 2-Nitrophenol
Endrin	p-Nitrophenol; 4-Nitrophenol
Endrin aldehyde	N-Nitrosodi-n-butylamine
Ethylbenzene	N-Nitrosodiethylamine
Ethyl methacrylate	N-Nitrosodimethylamine
Ethyl methanesulfonate	N-Nitrosodiphenylamine
Famphur	N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine
Fluoranthene	N-Nitrosomethylethalamine
Fluorene	N-Nitrosopiperidine
Heptachlor	N-Nitrosopyrrolidine
Heptachlor epoxide	5-Nitro-o-toluidine
Hexachlorobenzene	Parathion
Hexachlorobutadiene	Pentachlorobenzene
Pentachloronitrobenzene	
Pentachlorophenol	2,3,4,6-Tetrachlorophenol
Phenacetin	Thallium
Phenanthrene	Tin
Phenol	Toluene
p-Phenylenediamine	o-Toluidine
Phorate	Toxaphene
Polychlorinated biphenyls; PCBs; Aroclors	1,2,4-Trichlorobenzene
Pronamide	1,1,1-Trichloroethane; Methylchloroform
Propionitrile; Ethyl cyanide	1,1,2-Trichloroethane
Pyrene	Trichloroethylene; Trichloroethene
Safrole	Trichlorofluoromethane; CFC-11
Selenium	2,4,5-Trichlorophenol
Silver	2,4,6-Trichlorophenol
Silvex; 2,4,5-TP	1,2,3-Trichloropropane
	0,0,0-Triethyl phosphorothioate

Styrene	sym-Trinitrobenzene
Sulfide	Vanadium
2,4,5-T; 2,4,5-Trichlorophen- oxyacetic acid	Vinyl acetate
1,2,4,5-Tetrachlorobenzene	Vinyl chloride; Chloroethene
1,1,1,2-Tetrachloroethane	Xylene (total)
1,1,2,2-Tetrachloroethane	Zinc
Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	

History: Effective August 1, 1995.

South Dakota

74:27:21:01. Applicability. This chapter applies to all facilities required to perform assessment monitoring pursuant to chapter 74:27:20 if any parameter monitored pursuant to § 74:27:20:02 exhibits a statistically significant increase above the groundwater protection standard specified in § 74:27:20:07. If the owner or operator demonstrates according to 40 C.F.R. Part 258, as published on 56 Fed. Reg. 51,022 to 51,028, inclusive, (October 9, 1991) that a source other than the facility caused the increase, assessment monitoring may continue.

Source: 19 SDR 186, effective June 10, 1993.

General Authority: SDCL 34A-6-1.6, 34A-6-1.10.

Law Implemented: SDCL 34A-6-1.6, 34A-6-1.7, 34A-6-1.8.

74:27:21:02. Monitoring requirements. The owner or operator shall sample designated monitoring wells for parameters required by § 74:27:20:02. The secretary may require all sampling required by chapter 74:27:20 to be conducted by an independent, third-party groundwater scientist or engineer licensed to conduct business in South Dakota.

Source: 19 SDR 186, effective June 10, 1993; 20 SDR 56, effective October 24, 1993.

General Authority: SDCL 34A-6-1.6, 34A-6-1.10.

Law Implemented: SDCL 34A-6-1.6, 34A-6-1.7, 34A-6-1.8.

74:27:21:03. Assessment of corrective action. Within 90 days after discovery that corrective action is required pursuant to § 74:27:21:01, the owner or operator shall initiate the following:

- 1) Finalize the characterization of the nature and extent of the release;
- 2) Install, at a minimum, one additional monitoring well at the relevant point of compliance and sample the well or wells in accordance with §§ 74:27:20:02 and 74:27:20:08;
- 3) Notify the landowners and residents of any land potentially overlying the plume of contamination;
- 4) Analyze the effectiveness of potential corrective measures, including the following:
 - a) The performance, reliability, and cost of each measure;

- b) The time required to begin and complete each measure;
 - c) The cross-media impacts; and
 - d) Any other pertinent data;
- 5) Place a public notice in the official newspaper of the county in which the facility is located, stating the nature and extent of the release and legal descriptions of privately owned land potentially overlying the contaminant plume; and
 - 6) Present the results of the assessment of the corrective measures to the public at a minimum of one public meeting subject to the requirements of SDCL chapter 1-25 and record the public concerns expressed at the meeting or meetings.

Source: 19 SDR 186, effective June 10, 1993.

General Authority: SDCL 34A-6-1.6, 34A-6-1.10.

Law Implemented: SDCL 34A-6-1.6, 34A-6-1.7, 34A-6-1.8.

74:27:21:04. Selection of remedy. Based on the completion of the assessment requirements of § 74:27:21:03, the owner or operator shall submit a report within 14 days to the secretary for approval. The report shall recommend a primary plan of corrective action. The report must include documentation of the requirements of § 74:27:21:03 and must include the following elements:

- 1) Documentation of protection of human health and the environment;
- 2) The ability to attain the groundwater protection standards required by § 74:27:20:07;
- 3) Both short- and long-term anticipated effectiveness of the recommended corrective action;
- 4) Anticipated effectiveness of efforts to reduce or eliminate further contaminant releases from the facility;
- 5) The ability to effectively implement the recommended corrective action;
- 6) The financial and technical capability of the owner or operator to ensure completion of the recommended corrective action;
- 7) The degree to which the selected corrective action will address the community concerns expressed during the public meeting or meetings required by subdivision 74:27:21:03(6);
- 8) The schedule for initiation and completion of each major phase of the recommended corrective action; and
- 9) Other relevant factors and considerations which may determine the effectiveness of the corrective action.

The secretary may require the owner or operator to submit additional information in order to review and approve a course of corrective action.

Source: 19 SDR 186, effective June 10, 1993.

General Authority: SDCL 34A-6-1.6, 34A-6-1.10.

Law Implemented: SDCL 34A-6-1.6, 34A-6-1.7, 34A-6-1.8.

74:27:21:05. Implementation. Upon approval by the secretary of the selection of corrective action, the owner or operator shall begin implementation of corrective action within 30 days. The secretary may approve an alternative schedule, if warranted.

Source: 19 SDR 186, effective June 10, 1993.

General Authority: SDCL 34A-6-1.6, 34A-6-1.10.

Law Implemented: SDCL 34A-6-1.6, 34A-6-1.7, 34A-6-1.8.

74:27:21:06. Completion of corrective action. The owner or operator shall sample the designated monitoring wells to demonstrate compliance at the relevant point of compliance with the groundwater protection standards specified in § 74:27:20:07 for three consecutive years. If the owner or operator fails to adequately demonstrate compliance with § 74:27:20:07, the owner or operator shall perform additional corrective action required by § 74:27:21:03. Upon successful demonstration of completion of corrective action, the owner or operator shall notify the secretary within 14 days and may return to detection monitoring required by chapter 74:27:19. The demonstration required by this section shall be in conformance with 40 C.F.R. Part 258, as published on 56 Fed. Reg. 51,022 to 51,028, inclusive (October 9, 1991).

Source: 19 SDR 186, effective June 10, 1993.

General Authority: SDCL 34A-6-1.6, 34A-6-1.10.

Law Implemented: SDCL 34A-6-1.6, 34A-6-1.7, 34A-6-1.8.

74:27:21:07. Variances. The board or secretary may grant variances to the provisions of this chapter case by case. All demonstrations for variances for MSWLFs must meet the applicable requirements of 40 C.F.R. Part 258, as published on 56 Fed. Reg. 50,978 to 51,119, inclusive (October 9, 1991).

Source: 19 SDR 186, effective June 10, 1993.

General Authority: SDCL 34A-6-1.6, 34A-6-1.10.

Law Implemented: SDCL 34A-6-1.6, 34A-6-1.7, 34A-6-1.8.

Wisconsin

NR 507.30 Notification and response when values attain or exceed a

standard. The owner or operator of a solid waste facility shall notify the department in writing and respond as follows when a groundwater standard at the point of standards application or an explosive gas level has been attained or exceeded at the following devices:

(1) ALL GROUNDWATER MONITORING WELLS.

(a) The owner or operator shall notify the department in writing if any value attains or exceeds a groundwater standard. The notification shall specify the parameters for which standards have been attained or exceeded and the wells at which the standard was attained or exceeded and it shall provide a preliminary analysis of the cause and significance of each concentration in accordance with s. NR 140.24 (1) (a) or 140.26 (1)

(a). The sampling results and 2 copies of the notification shall be submitted to the department within 60 days from the end of the sampling period.

(b) When a groundwater standard has been attained or exceeded, the owner or operator shall respond in accordance with ch. NR 508.

(2) WATER SUPPLY WELLS. The owner or operator shall notify the department in writing if any value in a water supply sample attains or exceeds a groundwater standard or any other substances of concern are detected in the sample. The notification shall be in accordance with ss. NR 507.26 (2) and 507.30 (1).

(3) GAS MONITORING WELLS. When a stabilized gas reading exceeds the lower explosive limit at locations specified in s. NR 507.22 (4), the owner or operator shall immediately notify the department and respond in accordance with s. NR 507.22 (4).

History: Cr. Register, June, 1996, No. 486, eff. 7-1-96.

NR 508.01 Purpose. The purpose of this chapter is to establish procedures for responding to a groundwater standard which is attained or exceeded at any groundwater monitoring well at a solid waste facility and for conducting assessment monitoring at Subtitle D wells. This chapter is adopted under ch. 289, Stats., and s. 227.11, Stats.

History: Cr. Register, June, 1996, No. 486, eff. 7-1-96.

NR 508.02 Applicability.

(1) Except as otherwise provided, this chapter governs all solid waste facilities as defined by s. 289.01 (35), Stats., except hazardous waste facilities as defined in s. 291.01 (8), Stats., and regulated under chs. NR 600 to 690, and metallic mining operations as defined in s. 293.01 (9), Stats., and regulated under ch. NR 182.

(2) This chapter does not apply to the design, construction or operation of industrial wastewater facilities, sewerage systems and waterworks treating liquid wastes approved under s. 281.41, Stats., or permitted under ch. 283, Stats., nor to facilities used solely for the disposal of liquid municipal or industrial wastes which have been approved under s. 281.41, Stats., or permitted under ch. 283, Stats., except for facilities used for the disposal of solid waste.

History: Cr., Register, June, 1996, No. 486, eff. 7-1-96; **correction in (1) made under s. 13.93 (2m) (b) 7., Stats., Register March 2003 No. 567.**

NR 508.03 Definitions. The terms used in this chapter are defined in s. NR 500.03.

History: Cr., Register, June, 1996, No. 486, eff. 7-1-96.

NR 508.04 Responses when a groundwater standard is attained or exceeded at any groundwater monitoring well.

If a PAL, ACL or ES is attained or exceeded at any groundwater monitoring well according to s. NR 140.14 and the value is confirmed, the owner or operator shall comply with subs. (1) and (2) and may be required, either by the department or under s. NR 508.05 (5), to comply with subs. (3) and (4).

(1) The owner or operator shall notify the department in accordance with s. NR 507.30.

(2) The owner or operator shall respond in accordance with s. NR 140.24 or 140.26.

(3) If required by the department, the owner or operator shall develop a site investigation workplan and a site investigation report in accordance with ss. NR 716.05 to 716.11 and 716.15 to 716.17. If a site investigation report is submitted under s. NR 716.15, it shall include proof of financial responsibility to comply with s. NR 520.05 (1).

(4) If required by the department, the owner or operator shall evaluate and select remedial action options and develop a remedial action options report in accordance with ch. NR 722. Any soil contamination shall be addressed in accordance with the requirements of ch. NR 720.

(5) If the owner or operator implements remedial action, the department shall determine whether the remedial action has met the requirements of ch. NR 140 in accordance with ch. NR 726.

Note: For the purpose of this chapter, the department considers a value to be confirmed if a follow up field sample attains or exceeds the groundwater standard.

Note: Section NR 140.14(3) addresses exceedances for analytical results that fall between the limit of detection and the limit of quantitation.

History: Cr. Register, June, 1996, No. 486, eff. 7-1-96.

NR 508.05 Responses when a groundwater standard is attained or exceeded at a Subtitle D well. If a PAL, ACL or ES is attained or exceeded at a Subtitle D well and the value is confirmed, the owner or operator shall continue detection monitoring in accordance with s. NR 507.19 and shall respond in accordance with s. NR 508.04 and the following requirements:

(1) The owner or operator may demonstrate that a reported value represents a false exceedance of a groundwater standard in accordance with s. NR 507.28 (3). If the department does not concur with the written demonstration within 30 days, the owner or operator shall begin assessment monitoring in accordance with this subsection. If the department concurs within 30 days after receipt of the demonstration, the owner or operator need not begin assessment monitoring.

(2) The department may approve an alternate assessment monitoring program if the only parameters which are at or above the groundwater standards are the inorganic detection monitoring parameters listed under municipal solid waste in ch. NR 507 Appendix I Table 1.

(3) The owner or operator shall conduct an assessment monitoring program in accordance with all of the following requirements:

(a) The owner or operator shall collect and analyze assessment monitoring samples from all of the Subtitle D wells at the facility. The first set of assessment monitoring samples shall be collected during the first routine monitoring event following receipt of the groundwater standard exceedance. The first set of assessment monitoring samples shall be analyzed for the parameters determined under either subd. 1. or 2. or as approved by the department in writing:

1. All of the parameters listed in ch. NR 507 Appendix II.
2. All of the parameters detected in leachate samples collected to date in accordance with s. NR 507.21 (2).

(b) Annually, the owner or operator shall sample and analyze the leachate for the parameters listed in ch. NR 507 Appendix II. Within 14 days after obtaining the leachate sampling results, the owner or operator shall place the results in the operating record. Within 60 days after the end of the sampling period, the owner or operator shall submit the leachate sampling results to the department.

(c) Semiannually, the owner or operator shall sample the Subtitle D wells for all of the following:

1. All ch. NR 507 Appendix II parameters which have been detected in the leachate after July 1, 1996.

2. All ch. NR 507 Appendix II parameters which have been detected in Subtitle D wells after July 1, 1996.

(d) All assessment monitoring samples being analyzed for metals shall be obtained using the low-flow sampling technique.

(4) The owner or operator may submit a written request to cease the assessment monitoring program required under this section. The request shall demonstrate that 2 consecutive semi-annual sampling rounds show that all detected parameters in the groundwater samples from the Subtitle D wells are at or below groundwater standards listed in ch. NR 140 Tables 1 and 2, or PALs or ACLs established in accordance with s. NR 507.27. The department may approve the cessation of assessment monitoring if the only parameters which remain above the groundwater standards are the inorganic detection parameters listed under municipal solid waste in ch. NR 507 Appendix I Table 1.

(5) If an ES is attained or exceeded at a Subtitle D well and the value is confirmed, the owner or operator, in addition to s. NR 508.05 (intro.) and subs. (1) to (3), shall do all of the following:

(a) Notify the clerk of each municipality within which the landfill is located and whose boundary is within 1,200 feet of the limits of filling of any sampling result which exceeds an enforcement standard. The owner or operator shall notify the clerk within 14 days of receiving the sample result.

(b) Develop a site investigation work plan and a site investigation report in accordance with s. NR 508.04 (3).

(c) Evaluate and select remedial action options and develop a report in accordance with s. NR 508.04 (4).

Note: For the purpose of this chapter, the department considers a value to be confirmed if a follow up field sample attains or exceeds the groundwater standard.

History: Cr. Register, June, 1996, No. 486, eff. 7-1-96.