7045.0484 GROUNDWATER PROTECTION.

Subpart 1. **Scope.** This part applies as follows:

A. Except as provided in item B, the requirements of this part apply to owners or operators of facilities that treat, store, or dispose of hazardous waste. The owner or operator must comply with the requirements in subitems (1) to (3) for all wastes or waste constituents contained in solid or hazardous waste management units at the facility regardless of the time the waste was placed in such units:

(1) all solid waste management units must comply with part 7045.0485;

(2) a surface impoundment, waste pile, land treatment unit, landfill, or containment building that is required under Code of Federal Regulations, title 40, section 264.1102, as incorporated in part 7045.0550, to meet the requirements of a landfill, that receives hazardous waste after July 26, 1982, is a regulated unit and must comply with the requirements of subparts 2 to 14 for detecting, characterizing, and responding to releases; and

(3) the financial responsibility requirements of part 7045.0485 apply to regulated units.

B. The owner or operator is not subject to subparts 2 to 14 if the criteria in subitem (1), (2), or (3) are met:

(1) the owner or operator is exempted under part 7045.0450;

(2) the owner or operator designs and operates a waste pile in compliance with part 7045.0534, subpart 1; or

(3) the commissioner finds, under part 7045.0536, subpart 8, item D, that the treatment zone of a land treatment unit that qualifies as a regulated unit does not contain levels of hazardous constituents that are above background levels of those constituents by an amount that is statistically significant, and if an unsaturated zone monitoring program meeting the requirements of part 7045.0536, subpart 6, has not shown a statistically significant increase in hazardous constituents below the treatment zone during the operating life of the unit. An exemption can only relieve an owner or operator of responsibility to meet the requirements of subparts 2 to 14 during the postclosure care period.

C. The agency may impose any or all of the requirements of subparts 2 to 14 on the owner or operator of a facility that treats or stores hazardous waste in tanks or containers if it determines that the facility has the potential to adversely impact ground water quality. The agency shall specify in the facility permit which requirements of subparts 2 to 14 shall apply.

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

D. The requirements under subparts 2 to 14 apply during the active life of the regulated unit, including the closure period. After closure of the regulated unit, the applicability of the requirements in subparts 2 to 14 is as described in subitems (1) to (3):

(1) The requirements of subparts 2 to 14 do not apply if all waste, waste residues, contaminated containment system components, and contaminated subsoils are removed or decontaminated at closure. The owner or operator shall conduct sufficient soil analyses and ground water analyses for all hazardous constituents which are reasonably expected to be in or derived from the waste contained in the regulated unit to ensure that all waste residues and contaminated soil have been removed or decontaminated.

(2) The requirements of subparts 2 to 14 apply during the postclosure care period under part 7045.0492 if the owner or operator is conducting a detection monitoring program.

(3) The requirements of subparts 2 to 14 apply during the compliance period if the owner or operator is conducting a compliance monitoring program or a corrective action program.

Subp. 2. **Required programs.** Required programs include the following:

A. Owners and operators subject to this rule shall conduct a monitoring and response program as follows:

(1) If hazardous constituents or monitoring parameters from a regulated unit are detected and show a statistically significant increase at the compliance point, the owner or operator shall implement the compliance monitoring program.

(2) If the ground water protection standard is exceeded, the owner or operator shall institute a corrective action program.

(3) If hazardous constituents from a regulated unit exceed concentration limits in ground water at or past the compliance point, the owner or operator shall institute a corrective action program.

(4) In all other cases, the owner or operator shall institute a detection monitoring program.

B. All facilities must have a detection monitoring program, a compliance monitoring program, and a corrective action plan as part of the permit.

C. The agency shall specify in the facility permit the specific elements of the monitoring and response program and the circumstances under which each of the programs will be required.

D. The owner or operator shall submit a corrective action plan for the regulated unit with the permit application. The corrective action plan must demonstrate that corrective

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

action is feasible. The plan must address the measures necessary to meet the requirements specified in subpart 14, items B to F to remove or treat in place the hazardous constituents which exceed their concentration limits, and to monitor or demonstrate the effectiveness of the corrective action program. The plan must also include estimates of the time which may be necessary to complete corrective action if implemented when a concentration limit is first exceeded at the compliance point and the cost for completing the corrective action.

Subp. 3. **Groundwater protection standard.** The owner or operator shall comply with conditions specified in the facility permit that are designed to ensure that hazardous constituents detected in the groundwater from a regulated unit do not exceed the concentration limits in the groundwater at and beyond the point of compliance during the compliance period. The agency shall establish the groundwater protection standard in the facility permit when hazardous constituents have been detected in the groundwater based on data provided by monitoring of the groundwater quality as specified in subparts 11 and 12.

Subp. 4. **Hazardous constituents.** The agency shall specify in the facility permit the hazardous constituents to which the groundwater protection standard applies. Hazardous constituents are constituents identified in part 7045.0141, or constituents which are not listed in part 7045.0141, but which are contained in wastes that meet criteria established in part 7045.0131, subpart 6, for lethality and which may reasonably be expected to contribute to the lethality.

Subp. 5. **Hazardous constituent exemptions.** The agency shall exclude a hazardous constituent from the list of hazardous constituents specified in the facility permit if it finds that the constituent is not capable of posing a substantial present or potential hazard to human health or the environment. In deciding whether to grant an exemption, the agency shall consider the following:

A. potential adverse effects on ground water quality, considering:

(1) the physical and chemical characteristics of the waste in the regulated unit, including its potential for migration;

(2) the hydrogeological characteristics of the facility and surrounding land;

(3) the quantity of ground water and the directions of ground water flow;

(4) the proximity and withdrawal rates of ground water users;

(5) the current and future uses of ground water in the area;

(6) the existing quality of ground water, including other sources of contamination and their cumulative impact on the ground water quality;

(7) the potential for health risks caused by human exposure to waste constituents;

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

(8) the potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;

(9) the persistence and permanence of the potential adverse effects; and

B. potential adverse effects on hydraulically connected surface water quality, considering:

(1) the volume and physical and chemical characteristics of the waste in the regulated unit including its potential for migration;

(2) the hydrogeological characteristics of the facility and surrounding land;

(3) the quantity and quality of the ground water, and the directions of ground water flow;

(4) the patterns of precipitation in the region;

(5) the proximity of the regulated unit to surface waters;

(6) the current and future uses of surface waters in the area and any water quality standards established for those surface waters;

(7) the existing quality of surface water, including other sources of contamination and the cumulative impact on surface water quality;

(8) the potential for health risks caused by human exposure to waste constituents;

(9) the potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and

(10) the persistence and permanence of the potential adverse effects.

Subp. 6. **Concentration limits.** The agency shall specify in the facility permit the concentration limits in the groundwater for hazardous constituents which are reasonably expected to be in or derived from waste contained in a regulated unit or which are detected as a result of groundwater monitoring at the unit. The concentration of a hazardous constituent:

A. must not exceed the background level of that constituent in the groundwater at the time that limit is specified in the permit;

B. for any of the constituents listed as health risk levels in parts 4717.7100 to 4717.7800 or as maximum concentration limits in Code of Federal Regulations, title 40, part 141, must not exceed the lower of the respective values given in those parts if the background level of the constituent is below the lower of the values given in those parts; or

C. must not exceed an alternate limit established by the agency under subpart 8.

Subp. 7. [Repealed, 22 SR 5]

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

Subp. 8. **Alternate concentration limits.** The agency shall establish in the permit an alternate concentration limit for a hazardous constituent if it finds that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the alternate concentration limit is not exceeded. In establishing alternate concentration limits, the agency shall consider the following factors:

A. potentially adverse effects on ground water quality, considering:

(1) the physical and chemical characteristics of the waste in the regulated unit, including its potential for migration;

(2) the hydrogeological characteristics of the facility and surrounding land;

(3) the quantity of ground water and the directions and rates of ground water flow;

(4) the proximity and withdrawal rates of ground water users;

(5) the current and future uses of ground water in the area;

(6) the existing quality of ground water, including other sources of contamination and their cumulative impact on the ground water quality;

(7) the potential for health risks caused by human exposure to waste constituents;

(8) the potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;

(9) the persistence and permanence of the potential adverse effects; and

B. potential adverse effects on hydraulically connected surface water quality, considering:

(1) the volume and physical and chemical characteristics of the waste in the regulated unit;

(2) the hydrogeological characteristics of the facility and surrounding land;

(3) the quantity and quality of ground water, and the directions and rates of ground water flow;

(4) the patterns of rainfall in the region;

(5) the proximity of the regulated unit to surface waters;

(6) the current and future uses of surface waters in the area and any water quality standards established for those surface waters;

(7) the existing quality of surface water, including other sources of contamination and the cumulative impact on surface water quality;

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

(8) the potential for health risks caused by human exposure to waste constituents;

(9) the potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and

(10) the persistence and permanence of the potentially adverse effects.

Subp. 9. **Point of compliance.** The agency shall specify in the facility permit the point of compliance at which the ground water protection standard applies and at which monitoring must be conducted. The point of compliance is a vertical surface located at the hydraulically downgradient limit of the waste management area that extends to the bottom of potentially affected ground water underlying the regulated units.

The waste management area is the limit projected in the horizontal plane of the area on which waste will be placed during the active life of a regulated unit. The waste management area includes horizontal space taken up by any liner, dike, or other barrier designed to contain waste in a regulated unit.

If the facility contains more than one regulated unit, the agency shall establish compliance points for each unit. The agency may establish a single compliance point for more than one unit if the owner or operator demonstrates that ground water contamination can be detected from all units in a timely manner.

Subp. 10. **Compliance period.** The agency shall specify in the facility permit the compliance period during which the ground water protection standard applies. The compliance period is the number of years equal to the active life of the waste management area, including any waste management activity prior to permitting, and the closure period. The compliance period begins when the owner or operator initiates a compliance monitoring program meeting the requirements of subpart 13. If the owner or operator is engaged in a corrective action program at the end of the compliance period, the compliance period is extended until the owner or operator demonstrates that the ground water protection standard has not been exceeded for a period of five consecutive years.

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

Subp. 11. **General groundwater monitoring requirements.** The owner or operator shall comply with the requirements of items A to J for any groundwater monitoring program developed to satisfy subpart 12, 13, or 14:

A. The groundwater monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples from groundwater that:

(1) represent the quality of background groundwater that has not been affected by leakage from a regulated unit;

(a) a determination of background quality may include sampling of wells that are not hydraulically upgradient of the waste management area where:

i. hydrogeologic conditions do not allow the owner or operator to determine what wells are hydraulically upgradient; and

ii. sampling at other wells will provide an indication of background groundwater quality that is representative or more representative than that provided by the upgradient wells; and

(2) represent the quality of ground water passing the point of compliance; and

(3) allow for the detection of potential contamination from the regulated unit.

B. If a facility contains more than one regulated unit, the agency shall require a separate ground water monitoring system for each unit. The agency may require a single ground water monitoring system for more than one unit if the owner or operator of a multiunit facility demonstrates that a single ground water monitoring system enables timely detection and measurement at the compliance point of hazardous constituents from the regulated units.

C. Monitoring wells must be constructed and installed in accordance with chapter 4725 and cased in a manner that maintains the integrity of the monitoring well bore hole. The hole must be screened and packed with gravel or sand, where necessary, to enable collection of ground water samples. Where necessary, wells must be properly developed to enable collection of representative ground water samples. The annular space, that is, the space between the bore hole and well casing, above the sampling depth must be sealed to prevent contamination of samples and the ground water. Materials used in well construction must be compatible with the intended use of the well.

D. The ground water monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide a reliable indication of ground water quality below the waste management area. The program

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

must include procedures and techniques for: sample collection, sample preservation and shipment, analytical procedures, and chain of custody control.

E. The ground water monitoring program must include sampling and analytical methods that are appropriate for ground water sampling and that accurately measure hazardous constituents and monitoring parameters in ground water samples. "Monitoring parameter" means waste reaction products, nonhazardous waste constituents, and indicator parameters that provide a reliable indication of the presence of hazardous constituents in the ground water.

F. The ground water monitoring program must include a determination of the potentiometric surface and ground water flow directions at least quarterly and immediately prior to each time ground water is sampled. At least annually, the owner or operator shall determine the flow rates of the ground water being monitored. The agency must be notified of the results and if significant change has been detected, the appropriate changes must be made in the facility permit.

G. In detection monitoring or where appropriate in compliance monitoring, data on each hazardous constituent specified in the permit shall be collected from background wells and wells at the compliance points. The number and kinds of samples collected to establish background shall be appropriate for the form of statistical test employed, following generally accepted statistical principles. The sample size shall be as large as necessary to ensure with reasonable confidence that a contaminant release to groundwater from a facility will be detected. The owner or operator shall determine an appropriate sampling procedure and interval for each hazardous constituent listed in the facility permit which shall be specified in the facility permit upon approval by the agency. This sampling procedure shall be:

(1) a sequence of at least four samples, taken at an interval that assures, to the greatest extent technically feasible, that an independent sample is obtained, by reference to the uppermost aquifer's effective porosity, hydraulic conductivity, and hydraulic gradient, and the fate and transport characteristics of the potential contaminants; or

(2) an alternate sampling procedure proposed by the owner or operator and approved by the commissioner.

H. The owner or operator shall specify one of the following statistical methods to be used in evaluating groundwater monitoring data for each hazardous constituent which, upon approval by the commissioner, will be specified in the facility permit. The statistical test chosen shall be conducted separately for each hazardous constituent in each well. Where practical quantification limits are used in any of the following statistical procedures to comply with item I, subitem (5), the practical quantification limits must be proposed by the owner or operator and approved by the commissioner. Use of any of the

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

following statistical methods must be protective of human health and the environment and must comply with the performance standards outlined in item I.

(1) A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent.

(2) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent.

(3) A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit.

(4) A control chart approach that gives control limits for each constituent.

(5) Another statistical test method submitted by the owner or operator and approved by the commissioner.

I. Any statistical method chosen under item H for specification in the facility permit shall comply with the following performance standards, as appropriate:

(1) The statistical method used to evaluate groundwater monitoring data shall be appropriate for the distribution of chemical parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shown by the owner or operator to be inappropriate for a normal theory test, then the data should be transformed or a distribution-free theory test should be used. If the distributions for the constituents differ, more than one statistical method may be needed.

(2) If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a groundwater protection standard, the test shall be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparisons procedure is used, the Type I experiment wise error rate for each testing period shall be no less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons must be maintained. This performance standard does not apply to tolerance intervals, prediction intervals, or control charts.

(3) If a control chart approach is used to evaluate groundwater monitoring data, the specific type of control chart and its associated parameter values shall be proposed by the owner or operator and approved by the commissioner to be protective of human health and the environment.

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

(4) If a tolerance interval or a prediction interval is used to evaluate groundwater monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be proposed by the owner or operator and subject to an approval by the agency to be protective of human health and the environment. These parameters will be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

(5) The statistical method shall account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantification limit approved by the commissioner which is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

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

J. Groundwater monitoring data collected in accordance with item G, including actual levels of constituents, must be maintained in the facility operating record. The agency shall specify in the permit when the data must be submitted for review.

Subp. 12. **Detection monitoring program.** An owner or operator required to establish a detection monitoring program under this part shall perform the following:

A. The owner or operator shall monitor for monitoring parameters and hazardous constituents established in the permit to indicate the presence of hazardous constituents in the ground water. The monitoring parameters and hazardous constituents in the facility permit shall be determined after considering the following factors:

(1) the types, quantities, and concentrations of hazardous constituents and monitoring parameters in wastes managed at the regulated unit;

(2) the mobility, stability, and persistence of hazardous constituents and monitoring parameters in the unsaturated zone beneath the waste management area;

(3) the detectability of hazardous constituents and monitoring parameters in ground water; and

(4) the concentrations or values and coefficients of variation of proposed monitoring parameters or hazardous constituents in the ground water background.

B. The owner or operator shall install a ground water monitoring system at the compliance point. The ground water monitoring system must comply with subpart 11, items A, subitems (2) and (3); B; and C.

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

C. The owner or operator shall conduct a groundwater monitoring program for each chemical parameter and hazardous constituent specified in the permit under item A in accordance with subpart 11, item G. The owner or operator shall maintain a record of groundwater analytical data as measured and in a form necessary for the determination of statistical significance under subpart 11, item H.

D. The agency shall specify the frequencies for collecting samples and conducting statistical tests to determine whether there is statistically significant evidence of contamination for any parameter or hazardous constituent specified in the permit under item A in accordance with subpart 11, item G. A sequence of at least four samples from each well, background, and compliance wells, must be collected at least semiannually during detection monitoring.

E. The owner or operator of waste piles, land treatment units that have detected a significant increase in hazardous constituents or monitoring parameters below the treatment zone, and double lined surface impoundments and landfills where liquids have been detected in the leak detection system, shall comply with subitems (1) and (2):

(1) Ground water quality shall be determined at the compliance point at least quarterly during the active life of a regulated unit, including the closure period, and the postclosure period.

(2) The analysis of ground water samples must include analysis for hazardous constituents that are reasonably expected to be in or derived from the waste contained in the unit. The owner or operator shall express the ground water quality at a monitoring well in a form necessary for the determination of statistically significant increases under subpart 11, items H and I.

F. The owner or operator must determine whether there is statistically significant evidence of contamination for any chemical parameter or hazardous constituent specified in the permit under item A at a frequency specified under item D.

(1) In determining whether statistically significant evidence of contamination exists, the owner or operator must use the methods specified in the permit under subpart 11, item H. These methods must compare data collected at the compliance points to the background groundwater quality data.

(2) The owner or operator must determine whether there is statistically significant evidence of contamination at each monitoring well as the compliance point within a reasonable period of time after completion of sampling. The agency shall specify in the facility permit what period of time is reasonable, after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of groundwater samples.

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

G. If the owner or operator determines under item F that there is statistically significant evidence of contamination for chemical parameters or hazardous constituents specified under item A at any monitoring well at the compliance point, the owner or operator must:

(1) Notify the commissioner of this finding in writing within seven days. The notification must indicate what chemical parameters or hazardous constituents have shown statistically significant evidence of contamination.

(2) Immediately sample the groundwater in all monitoring wells and determine whether constituents in the list of part 7045.0143 are present, and if so, in what concentration.

(3) For part 7045.0143 compounds found in the analysis under subitem (2), the owner or operator may resample within one month and repeat the analysis for those compounds detected. If the results of the second analysis confirm the initial results, then these constituents shall form the basis for compliance monitoring. If the owner or operator does not resample, the hazardous constituents found during this initial part 7045.0143 analysis shall form the basis for compliance monitoring.

(4) Within 90 days, submit to the commissioner an application for a permit modification to establish a compliance monitoring program meeting the requirements of subpart 13. The application must include the following information:

(a) an identification of the concentration of a part 7045.0143 constituent detected in the groundwater at each monitoring well at the compliance point;

(b) proposed changes to the groundwater monitoring system at the facility necessary to meet the requirements of subpart 13;

(c) proposed additions or changes to the monitoring frequency, sampling and analysis procedures or methods, or statistical methods used at the facility necessary to meet the requirements of subpart 13; and

(d) for each hazardous constituent detected at the compliance point, a proposed concentration limit under subpart 6, item A or B, or a notice of intent to seek an alternate concentration limit under subpart 8.

(5) Within 180 days, submit to the commissioner all data necessary to justify an alternate concentration limit sought under subpart 8, and an engineering feasibility plan for a corrective action program necessary to meet the requirement of subpart 14, unless:

(a) all hazardous constituents identified under subitem (2), are listed in subpart 7 and their concentrations do not exceed the respective values given in that table; or

(b) the owner or operator has sought an alternate concentration limit under subpart 8 for every hazardous constituent identified under subitem (2).

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

(6) If the owner or operator determines, under item F, that there is a statistically significant difference for chemical parameters or hazardous constituents specified under item A at any monitoring well at the compliance point, the owner or operator may demonstrate that a source other than a regulated unit caused the contamination or that the detection is an artifact caused by an error in sampling, analysis, or statistical evaluation or natural variation in the groundwater. The owner or operator may make a demonstration under this paragraph in addition to, or in lieu of, submitting a permit modification application under subitem (4); however, the owner or operator is not relieved of the requirement to submit a permit modification application within the time specified in subitem (4) unless the demonstration made under this subitem successfully shows that a source other than a regulated unit caused the increase, or that the increase resulted from error in sampling, analysis, or evaluation. In making a demonstration, the owner or operator shall:

(a) notify the commissioner in writing within seven days of determining statistically significant evidence of contamination at the compliance point that the owner or operator intends to make a demonstration under this subunit;

(b) within 90 days, submit a report to the commissioner which demonstrates that a source other than a regulated unit caused the contamination or that the contamination resulted from an error in sampling, analysis, or evaluation;

(c) within 90 days, submit to the commissioner an application for a permit modification to make any appropriate changes to the detection monitoring program facility; and

(d) continue to monitor in accordance with the detection monitoring program established under this subpart.

H. If the owner or operator determines that the detection monitoring program no longer satisfies the requirements of this subpart, the owner or operator must, within 90 days, submit an application for a permit modification to make any appropriate changes to the program.

Subp. 13. **Compliance monitoring program.** An owner or operator required to establish a compliance monitoring program under this part shall perform the following:

A. The owner or operator shall monitor the ground water to determine whether regulated units are in compliance with the ground water protection standard. The agency shall specify the ground water protection standard in the facility permit including:

(1) a list of hazardous constituents;

(2) concentration limits for each of those hazardous constituents;

(3) the compliance point; and

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

(4) the compliance period.

B. The owner or operator shall install a ground water monitoring system at the compliance point. The ground water monitoring system must comply with subpart 11, items A, subitems (2) and (3); B; and C.

C. The agency shall specify the sampling procedures and statistical methods appropriate for the constituents and the facility, consistent with subpart 11, items G and H as described in subitems (1) and (2).

(1) The owner or operator must conduct a sampling program for each chemical parameter or hazardous constituent in accordance with subpart 11, item G.

(2) The owner or operator must record groundwater analytical data as measured and in the form necessary for the determination of statistical significance under subpart 11, item H, for the compliance period of the facility.

D. The owner or operator must determine whether there is statistically significant evidence of increased contamination for any chemical parameter or hazardous constituent specified in the permit, under item A, at a frequency specified under item F.

(1) In determining whether statistically significant evidence of increased contamination exists, the owner or operator must use the methods specified in the permit under subpart 11, item H. The methods must compare data collected at the compliance points to a concentration limit developed in accordance with subpart 6.

(2) The owner or operator must determine whether there is statistically significant evidence of increased contamination at each monitoring well at the compliance point within a reasonable time period after completion of sampling. The agency will specify that time period in the facility permit, after considering the complexity of the statistical test and the availability of laboratory facilities, to perform the analysis of groundwater samples.

E. The owner or operator shall analyze samples from all monitoring wells at the compliance point to determine whether hazardous constituents identified in the list in part 7045.0143 are present and, if they are present, determine the concentration of each. The analysis must be conducted at least annually to determine whether additional part 7045.0143 hazardous constituents are present in the monitoring wells. The owner or operator shall report the concentrations of all hazardous constituents to the commissioner within seven days after completion of the analysis. The agency shall require a permit modification to include additional hazardous constituents, which have been detected in the groundwater, in all subsequent quarterly groundwater monitoring under item D.

F. The agency shall specify the frequencies for collecting samples and conducting statistical tests to determine statistically significant evidence of increased contamination in accordance with subpart 11, item G. A sequence of at least four samples

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

from each background and compliance well must be collected at least semiannually during the compliance period of the facility.

G. The owner or operator must analyze samples from all monitoring wells at the compliance point for all constituents contained in part 7045.0143 at least annually to determine whether additional hazardous constituents are present in the uppermost aquifer and, if so, at what concentration, according to procedures in subpart 12, item F. If the owner or operator finds part 7045.0143 constituents in the groundwater that are not already identified in the permit as monitoring constituents, the owner or operator may resample within one month and repeat the part 7045.0143 analysis. If the second analysis confirms the presence of new constituents, the owner or operator must report the concentration of these additional constituents to the commissioner within seven days after the completion of the second analysis and add them to the monitoring list. If the owner or operator chooses not to resample, then the owner or operator shall report the concentrations of these additional constituents to the commissioner within seven days after completion of the initial analysis and add them to the monitoring list.

H. If the owner or operator determines that the ground water protection standard is being exceeded at any monitoring well at the point of compliance, he or she shall comply with the requirements of subitems (1) to (3):

(1) The owner or operator shall notify the commissioner of this finding in writing within seven days. The notification must indicate the concentration limits that have been exceeded.

(2) The owner or operator shall institute the corrective action program specified in the permit and submit to the agency an application for permit modification, if necessary to supplement the corrective action program to meet the requirements of subpart 14, within 90 days. The application must include a detailed description of corrective actions that will achieve compliance with the ground water protection standard specified in the permit and a plan for a ground water monitoring program that will demonstrate the effectiveness of the corrective action program. The ground water monitoring program may be based on a compliance monitoring program developed to meet the requirements of items A to G. The ground water monitoring program must also be capable of demonstrating compliance with the concentration limits in the ground water at the downgradient portion of the property line of the facility.

(3) If the owner, operator, or commissioner determines that the concentration limits are being exceeded at a monitoring well at the property line pursuant to subitem (2), the owner or operator shall cease accepting wastes at the facility. If he or she can demonstrate that specific individual units have not violated the ground water protection standard, those units for which a demonstration can be made may resume accepting wastes following agency approval of the demonstration.

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

I. If the owner or operator determines, under item G or H, that the groundwater protection standard is being exceeded at any monitoring well at the point of compliance, the owner or operator may demonstrate that a source other than a regulated unit caused the contamination or that the detection is an artifact caused by an error in sampling, analysis, statistical evaluation, or natural variation in the groundwater. Until the owner or operator makes a demonstration, the owner or operator is not relieved of the requirement to submit a permit modification application if necessary to comply with item H within the time specified in item H, subitem (2) or of the requirement to institute corrective actions as established in item H, subitem (2). In making a demonstration, the owner or operator shall:

(1) notify the commissioner in writing within seven days of the intent to make a demonstration;

(2) within 90 days, submit a report to the commissioner which demonstrates that a source other than a regulated unit caused the standard to be exceeded or that the apparent noncompliance with the standards resulted from error in sampling, analysis, or evaluation;

(3) within 90 days, submit to the agency an application for a permit modification to make any appropriate changes to the compliance monitoring program at the facility; and

(4) continue to monitor in accordance with the compliance monitoring program.

J. If the owner, operator, or commissioner determines that the compliance monitoring program no longer satisfies the requirements of items A to I the owner or operator shall, within 90 days, submit an application for a permit modification to make any appropriate changes to the program.

K. The owner or operator shall ensure that monitoring and corrective action measures necessary to achieve compliance with the ground water protection standard are taken during the term of the permit.

Subp. 14. **Corrective action program.** An owner or operator required to establish a corrective action program shall perform the following:

A. The owner or operator shall take corrective action to ensure that regulated units are in compliance with the ground water protection standard. The agency shall specify the ground water protection standard in the facility permit, including:

(1) a list of the hazardous constituents;

(2) concentration limits for each of those hazardous constituents;

(3) the compliance point; and

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

(4) the compliance period.

B. The owner or operator shall implement a corrective action program that prevents hazardous constituents from exceeding their respective concentration limits at the compliance point by removing the hazardous waste constituents or treating them in place. The permit must indicate the specific measures that will be taken.

C. The owner or operator shall begin corrective action within one week after the ground water protection standard is exceeded, unless a different period is established in the permit.

D. In conjunction with a corrective action program, the owner or operator shall establish and implement a ground water monitoring program to demonstrate the effectiveness of the corrective action program. The monitoring program may be based on the requirements for a compliance monitoring program and must be as effective as that program in determining compliance with the ground water protection standard, and in determining the success of a corrective action program under item E where appropriate. This monitoring program must also be capable of demonstrating compliance with the concentration limits in the permit in the ground water at the downgradient portion of the facility property line.

E. In addition to the other requirements the owner or operator shall conduct a corrective action program to remove or treat in place hazardous constituents established under subpart 4 that exceed concentration limits in groundwater established under subparts 6, 7, and 8:

(1) between the compliance point established under subpart 9 and the downgradient property boundary; and

(2) beyond the facility boundary, where necessary to protect human health and the environment, unless the owner or operator demonstrates to the satisfaction of the commissioner that, despite the owner's or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake the action. The owner or operator is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address the releases will be determined on a case-by-case basis.

Corrective action measures must be initiated and completed within a reasonable period of time considering the extent and magnitude of contamination. If the owner, operator, or commissioner determines that corrective action measures are not initiated or completed within a reasonable period of time considering the extent and magnitude of contamination, the owner or operator shall cease accepting wastes at the facility.

Corrective action measures may be terminated once the concentration of hazardous constituents is reduced to levels below their respective concentration limits at the

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.

compliance point and areas downgradient of the compliance point including areas beyond the facility property line.

F. The owner or operator shall continue corrective action measures during the compliance period to the extent necessary to ensure that the ground water protection standard is not exceeded at a monitoring well. If the owner or operator is conducting corrective action at the end of the compliance period, he or she shall continue that corrective action for as long as necessary to achieve compliance with the ground water protection standard at all monitoring wells. The owner or operator may terminate corrective action measures taken beyond the period equal to the active life of the waste management area, including the closure period, if he or she can demonstrate, based on data from the ground water monitoring program under item D that the ground water protection standard has not been exceeded for a period of five consecutive years at any monitoring well.

G. The owner or operator shall report semiannually in writing to the commissioner on the effectiveness of the corrective action program.

H. If the owner, operator, or commissioner determines that the corrective action program no longer satisfies the requirements of items A to G, the owner or operator shall, within 90 days, submit an application for a permit modification to make appropriate changes to the program.

Statutory Authority: *MS s 116.07; 116.37*

History: *9 SR 115; 11 SR 1832; L 1987 c 186 s 15; 13 SR 577; 13 SR 2761; 15 SR 1515; 15 SR 1878; 22 SR 5; 33 SR 2042*

Published Electronically: *October 10, 2013*

Copyright ©2013 by the Revisor of Statutes, State of Minnesota. All Rights Reserved.