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SUBCHAPTER 10. GROUND WATER MONITORING REQUIREMENTS FOR HAZARDOUS WASTE FACILITIES

7:14A-10.1 Scope and purpose

(a) This subchapter establishes the requirements for conducting ground water monitoring at hazardous waste facilities, as required by N.J.A.C. 7:26G and 40 C.F.R. Parts 264 and 265, including design of the ground water monitoring system, sampling, parameters and frequency of analyses, evaluation of data, recordkeeping, and reporting.

(b) It is essential that the monitoring program provide adequate data over a sufficient period of time to accurately represent conditions and variations of background ground water quality and the hydrologic characteristic of the hazardous waste facility site area. It is essential that the monitoring program be sufficient to ensure protection of ground water resources.

7:14A-10.2 Applicability

(a) The requirements in this subchapter apply to:

1. Hazardous waste facilities as defined by N.J.A.C. 7:26G-8 through 7:26G-9.

(b) All hazardous waste facilities shall obtain a NJPDES-DGW permit to conduct ground water monitoring and corrective action as specified in this subchapter, unless exempted pursuant to N.J.A.C. 7:14A-2.5(a)9 or 10.

7:14A-10.3 Exemptions

(a) The owner or operator of a hazardous waste facility unit or units is not subject to regulation for releases into the uppermost aquifer under this subchapter if:

1. The owner or operator is exempt pursuant to the rules governing hazardous waste facilities in N.J.A.C. 7:26G-8 through 9.

7:14A-10.4 General ground water monitoring well requirements

(a) In addition to monitoring requirements specified elsewhere in this subchapter, all of the following requirements apply to the installation, maintenance, sampling and closure of monitoring wells.

1. Ground water monitoring wells shall be constructed in accordance with the edition of the Department's "Field Sampling Procedures Manual"

applicable at the time of well construction, an alternate method approved by the Department, or as set forth in the NJPDES-DGW permit.

2. A well permit, as required by N.J.S.A. 58:4A-1 et seq., shall be obtained prior to the installation of any ground water monitoring well. A clear and accurate record or base map providing the monitoring well location, depth, elevation and achievable pumping rate shall be kept at the facility by the owner or operator and made available to the Department.

3. Ground water sampling and analysis shall be conducted in accordance with the edition of the Department's "Field Sampling Procedures Manual" applicable at the time of sampling, an alternate method approved by the Department, or as set forth in the NJPDES-DGW permit.

4. Wells shall be capped to prevent precipitation from entering the well bore hole or introduction of extraneous material and substances into the well which might invalidate analytical results. All monitoring wells shall be cased in a manner that maintains the integrity of the monitoring well bore hole. Wells shall be screened and packed with gravel or sand where necessary to enable sample collection at depths where appropriate. The annular space (that is, the space between the bore hole and well casing) above the sampling depth shall be sealed with a suitable material (for example, cement grout or bentonite slurry) to prevent contamination of samples and ground water.

5. The elevation of the top of the well casing for each ground water monitoring well shall be established and said elevation shall be permanently marked on the well casing. The elevation established shall be in relation to the New Jersey Geodetic Control Survey datum. Each monitoring well casing shall be permanently marked with a number to be assigned or approved by the Department. This will typically be the well permit number issued with the permit to construct the well.

7:14A-10.5 Ground water monitoring program requirements for hazardous waste facilities

(a) Any owner or operator subject to this subchapter shall conduct a monitoring program as follows:

1. Whenever any hazardous constituent pursuant N.J.A.C. 7:14A-10.7 from a hazardous waste facility unit is detected at a compliance point established pursuant to N.J.A.C. 7:14A-10.9, the owner or operator shall institute a compliance monitoring program under N.J.A.C. 7:14A-10.13. "Detected" is defined as statistically significant evidence of contamination as described in N.J.A.C. 7:14A-10.12(f);

2. Whenever the ground water protection standard under N.J.A.C. 7:14A-

10.6 is exceeded, the owner or operator shall institute a corrective action program under N.J.A.C. 7:14A-10.14. "Exceeded" is defined as statistically significant evidence of increased contamination as described in N.J.A.C. 7:14A-10.13(d);

i. Whenever hazardous constituents under N.J.A.C. 7:14A-10.7 from a hazardous waste facility unit exceed concentration limits under N.J.A.C. 7:14A-10.8 in ground water between the relevant point of compliance under N.J.A.C. 7:14A-10.9 and the downgradient hazardous waste facility property boundary, the owner or operator shall institute a corrective action program under N.J.A.C. 7:14A-10.14; or

ii. In all other cases, the owner or operator shall institute a detection monitoring program under N.J.A.C. 7:14A-10.11.

(b) The Department shall specify in the NJPDES-DGW permit the specific elements of the monitoring and response program. The Department may include one or more of the programs identified in (a) above in the NJPDES-DGW permit as may be necessary to protect human health and the environment and shall specify the circumstances under which each of the programs will be required. In deciding whether to require the owner or operator to institute a particular program, the Department shall consider the potential adverse effects on human health and the environment that might occur before final administrative action on a permit modification application to incorporate such a program could be taken.

7:14A-10.6 Ground water protection standard

The owner or operator shall comply with conditions specified in the NJPDES-DGW permit that are designed to ensure that hazardous constituents under N.J.A.C. 7:14A-10.7 detected in the ground water from a hazardous waste facility unit do not exceed the concentration limits under N.J.A.C. 7:9C or 7:14A-10.8 in the uppermost aquifer underlying the hazardous waste facility area beyond the relevant point of compliance under N.J.A.C. 7:14A-10.9 during the compliance period under N.J.A.C. 7:14A-10.10. The Department shall establish this ground water protection standard in the NJPDES-DGW permit when hazardous constituents have been detected in the ground water.

7:14A-10.7 Hazardous constituents

(a) The Department shall specify in the NJPDES-DGW permit the hazardous constituents to which the ground water protection standard of N.J.A.C. 7:14A-10.6 applies. Hazardous constituents are constituents identified in 40 CFR Part 261 Appendix VIII that have been detected in ground water in the uppermost aquifer under lying a hazardous waste facility unit and that are reasonably

expected to be in or derived from waste contained in a hazardous waste facility unit, unless the Department has excluded them under (b) below.

(b) The Department shall exclude a 40 CFR Part 261 Appendix VIII constituent from the list of hazardous constituents specified in the NJPDES-DGW permit if it finds that the constituent is not capable of posing a substantial present or potential hazard to human health or the environment based on the following:

1. Potential adverse effects on ground water quality, considering:

   i. The physical and chemical characteristics of the waste in the hazardous waste facility unit, including its potential for migration;

   ii. The hydrogeological characteristics of the facility and surrounding land;

   iii. The quantity of ground water and the direction of ground water flow:

   iv. The proximity and withdrawal rates of ground water users;

   v. The current and future uses of ground water in the area;

   vi. The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground water quality;

   vii. The potential for health risks caused by human exposure to waste constituents;

   viii. The potential damage to wild life, crops, vegetation, and physical structures caused by exposure to waste constituents; and

   ix. The persistence and permanence of the potential adverse effects;

2. Potential adverse effects on hydraulically connected surface water quality, considering:

   i. The volume and physical and chemical characteristics of the waste in the hazardous waste facility unit;

   ii. The hydrogeological characteristics of the facility and surrounding land;

   iii. The quantity and quality of ground water, and the direction of ground water flow;

   iv. The patterns of rainfall in the region;

v. The proximity of the hazardous waste facility unit to surface waters;

vi. The current and future uses of surface waters in the area and any water quality standards established for those surface waters;

vii. The existing quality of surface water, including other sources of contamination and the cumulative impact on surface water quality;

viii. The potential for health risks caused by human exposure to waste constituents;

ix. The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and

x. The persistence and permanence of the potential adverse effects.

(c) In making any determination under (b) above, the Department shall assess any identified underground sources of drinking water.

7:14A-10.8 Concentration limits

(a) The Department shall specify in the NJPDES-DGW permit concentration limits in the ground water for hazardous constituents established under N.J.A.C. 7:14A-10.7. The concentration of a hazardous constituent:

1. Shall not exceed the background level of that constituent in the ground water at the time that limit is specified in the permit;

2. For any of the constituents listed in (a)2i below, shall not exceed the ground water quality criteria of N.J.A.C. 7:9C, or the 40 CFR 264.93 Table 1 concentration, whichever is more stringent, if the background level of the constituent is below the more stringent of the relevant concentration limits for those parameters; or

i. The following constitutents shall be evaluated in accordance with (a)2 above: arsenic, silver, barium, endrin, cadmium, lindane, chromium, methoxychlor, lead, toxaphene, mercury, 2, 4-D, selenium, 2, 4, 5-TP Silvex; or

3. Shall not exceed an alternate limit established by the Department under (b) below.

(b) The Department shall establish an alternate concentration limit for a hazardous constituent if it finds that the constituent shall not pose a substantial present or potential hazard to human health or the environment if such alternate concentration limit is not exceeded, based on the following:

1. Potential adverse effects on ground water quality, considering:

i. The physical and chemical characteristics of the waste in the hazardous waste facility unit, including its potential for migration;

ii. The hydrogeological characteristics of the facility and surrounding land;

iii. The quantity of ground water and the direction of ground water flow;

iv. The proximity and withdrawal rates of ground water users;

v. The current and future uses of ground water in the area;

vi. The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground water quality;

vii. The potential for health risks caused by human exposure to waste constituents;

viii. The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure. to waste constituents; and

ix. The persistence and permanence of the potential adverse effects;

2. Potential adverse effects on hydraulically connected surface water quality, considering:

i. The volume and physical and chemical characteristics of the waste in the hazardous waste facility unit;

ii. The hydrogeological characteristics of the facility and surrounding land;

iii. The quantity and quality of ground water, and the direction of ground water flow;

iv. The patterns of rainfall in the region;

v. The proximity of the hazardous waste facility unit to surface waters;

vi. The current and future uses of for those surface waters in the area and any water quality standards established for those surface waters;

vii. The existing quality of surface water, including other sources of contamination and the cumulative impact on surface water quality;

viii. The potential for health risks caused by human exposure to waste constituents;

ix. The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and

x. The persistence and permanence of the potential adverse effects.

(c) In making any determination under (b) above, the Department shall assess any identified underground sources of drinking water.

7:14A-10.9 Relevant point of compliance

(a) The Department shall specify in the NJPDES-DGW permit the relevant point of compliance at which the ground water protection standard of N.J.A.C. 7:14A-10.6 applies and at which monitoring shall be conducted. The relevant point of compliance is a vertical surface located at the hydraulically downgradient limit of the hazardous waste facility unit (unit) that extends down into the uppermost aquifer underlying the hazardous waste facility unit(s).

(b) The hazardous waste management unit is the limit projected in the horizontal plane of the area on which hazardous waste shall be placed during the active life of a hazardous waste facility unit.

1. The hazardous waste management unit includes horizontal space taken up by any liner, dike, or other barrier designed to contain hazardous waste in a hazardous waste facility unit.

2. If the facility contains more than one hazardous waste facility unit, the hazardous waste management unit is described by an imaginary line circumscribing the several hazardous waste facility units.

(c) Unless otherwise determined by the Department, the relevant point of compliance specified shall be no more than 150 meters from the hazardous waste management unit boundary and shall be located on land owned by the owner of the hazardous waste facility. In determining the relevant point of compliance, the Department shall consider the following factors:

1. The hydrogeologic characteristics of the facility and the surrounding land;

2. The volume and physical and chemical characteristics of the leachate;

3. The quantity, quality and direction of flow of ground water;

4. The proximity and withdrawal rate of the ground water users;

5. The availability of alternative drinking water supplies; and

6. The existing quality of the ground water, including other sources of contamination and their cumulative impacts on the ground water, and

whether the ground water is currently used or reasonably expected to be used for drinking water.

7:14A-10.10 Compliance period

(a) The Department shall specify in the NJPDES-DGW permit the compliance period during which the ground water protection standard of N.J.A.C. 7:14A-10.6 applies. The compliance period is the number of years equal to the active life of the hazardous waste management unit in N.J.A.C. 7:14A-10.9(b) (including any hazardous waste management activity prior to permitting and the closure period.)

(b) The compliance period begins when the owner or operator initiates a compliance monitoring program meeting the requirements of N.J.A.C. 7:14A-10.13.

(c) If the owner or operator is engaged in a corrective action program at the end of the compliance period specified in (a) above, the compliance period is extended until the owner or operator can demonstrate that the ground water protection standard of N.J.A.C. 7:14A-10.6 has not been exceeded for a period of three consecutive years.

7:14A-10.11 Ground water monitoring system performance standards

(a) The owner or operator shall comply with the following requirements for any ground water monitoring program developed to satisfy N.J.A.C. 7:14A-10.12, 10.13 or 10.14. A ground water monitoring system shall consist of a sufficient number of wells, installed at appropriate locations and depths to yield ground water samples from the upper most aquifer that:

1. Represent the quality of background water that has not been affected by leakage from a hazardous waste facility unit.

   i. A determination of background ground water quality may include sampling of wells that are not hydraulically upgradient of the hazardous waste management area as described at N.J.A.C. 7:14A-10.9(b), where:

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

      (2) Sampling at other wells will provide an indication of background ground water quality that is representative or more representative than that provided by the upgradient wells;

2. Represent the quality of ground water passing the relevant point of compliance; and

3. Allow for the detection of contamination when hazardous waste or hazardous constituents have migrated from the hazardous waste management area to the uppermost aquifer.

(b) If a facility contains more than one hazardous waste facility unit, separate ground water monitoring systems are not required for each hazardous waste facility unit provided that provisions for sampling the ground water in the uppermost aquifer will enable detection and measurement at the relevant point of compliance of hazardous constituents from the hazardous waste facility units that have entered the ground water in the uppermost aquifer.

(c) Monitoring wells shall be cased in a manner that maintains the integrity of the monitoring well bore hole. This casing shall be screened or perforated and packed with gravel or sand, where necessary, to enable collection of ground water samples. The annular space (that is, the space between the bore hole and well casing) above the sampling depth shall be sealed to prevent contamination of samples and the ground water. In addition to these general well construction standards, all monitoring wells shall be constructed in accordance with the edition of the Department's "Field Sampling Procedures Manual" applicable at the time of construction, an alternate method approved by the Department, or as set forth in the NJPDES-DGW permit.

(d) The ground water monitoring system shall include sampling and analysis procedures that are designed to ensure monitoring results that provide a reliable indication of ground water quality below the hazardous waste management area as described at N.J.A.C. 7:14A-10.9(b). At a minimum, the program shall include procedures and techniques for:

1. Sample collection;

2. Sample preservation and shipment;

3. Analytical procedures; and

4. Chain of custody control.

(e) The ground water monitoring system shall include sampling and analytical methods that are appropriate for ground water sampling and that accurately measure hazardous constituents in ground water samples.

(f) The ground water monitoring system shall include a determination of the ground water surface elevation each time ground water is sampled.

(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 point(s). 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 ground water 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 NJPDES-DGW permit which shall be specified in the NJPDES-DGW permit upon approval by the Department. This sampling procedure shall be:

1. A sequence of at least four samples, taken at an interval that ensures, 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 approved by the Department.

(h) The owner or operator shall specify one of the following statistical methods to be used in evaluating ground water monitoring data for each hazardous constituent which, upon approval by the Department, shall be specified in the NJPDES-DGW permit. The statistical test shall be conducted separately for each hazardous constituent in each well. Where practical quantification limits (PQLs) are used in any of the following statistical procedures to comply with (i)5 below, the PQL shall be approved by the Department. Use of any of the following statistical methods shall be protective of human health and the environment and shall comply with the performance standards in (i) below.

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

5. Another statistical test method approved by the Department.

(i) Any statistical method chosen pursuant to (h) above shall comply with the following performance standards, as appropriate:

1. The statistical method used to evaluate ground water 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 must be transformed or a distribution free theory test must be used. If the distribution for the constituents differ, more than one statistical method shall be needed.

2. If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentration or a ground water 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 comparison procedure is used, the Type I experimentwise 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 comparison shall 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 ground water 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 Department if it finds it to be protective of human health and the environment.

4. If a tolerance interval or a prediction interval is used to evaluate ground water monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval shall contain, shall be proposed by the owner or operator and approved by the Department if it finds these parameters to be protective of human health and the environment. These parameters shall 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 (PQL) approved by the Department under (h) above that 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) Ground water monitoring data collected in accordance with (g) above, including actual levels of constituents, shall be maintained in the permanent records maintained by the facility. The Department shall specify in the permit when the data shall be submitted for review.

7:14A-10.12 Leak detection monitoring program

(a) An owner or operator required to establish a leak detection monitoring program under this subchapter shall monitor for indicator parameters (for example, specific conductance, total organic carbon, or total organic halogen), or waste constituents or reaction products that provide a reliable indication of the presence of hazardous constituents in ground water. The Department shall specify the parameters or constituents to be monitored in the NJPDES-DGW permit, based on the following factors:

1. The types, quantities, and concentrations of constituents in wastes managed at the hazardous waste facility unit;

2. The mobility, stability, and persistence of waste constituents or their reaction products in the unsaturated zone beneath the hazardous waste facility unit;

3. The detectability of indicator parameters, waste constituents, and reaction products in ground water; and

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

(b) The owner or operator shall install a ground water monitoring system at the relevant point of compliance specified under N.J.A.C. 7:14A-10.9. The ground water monitoring system shall comply with N.J.A.C. 7:14A-10.11(a), (b) and (c).

(c) The owner or operator shall conduct a ground water monitoring system for each chemical parameter and hazardous constituent specified in the permit pursuant to (a) above in accordance with N.J.A.C. 7:14A-10.11(g). The owner or operator shall maintain a complete and continuous record of ground water analytical data as measured and in a form necessary for the determination of statistical significance under N.J.A.C. 7:14A-10.11(h).

(d) The Department 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 pursuant to (a) above in accordance with N.J.A.C. 7:14A-10.11(g). A sequence of at least four samples from each well (background and compliance

wells) shall be collected at least semiannually during leak detection monitoring.

(e) The owner or operator shall determine the ground water flow rate and direction in the uppermost aquifer at least annually.

(f) The owner or operator shall determine whether there is statistically significant evidence of contamination for any chemical parameter or hazardous constituent specified pursuant to (a) above at a frequency specified pursuant to (d) above.

1. In determining whether statistically significant evidence of contamination exists, the owner or operator shall use the method(s) specified under N.J.A.C. 7:14A-10.11(h). These method(s) shall compare data collected at the compliance point(s) to the background ground water quality data.

2. The owner or operator shall determine whether there is statistically significant evidence of contamination at each monitoring well at the relevant point of compliance within a reasonable period of time after completion of sampling. The Department shall specify in the NJPDES-DGW 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 ground water samples.

(g) If the owner or operator determines pursuant to (f) above that there is statistically significant evidence of contamination for chemical parameters or hazardous constituents specified pursuant to (a) above at any monitoring well at the relevant point of compliance, the owner or operator shall:

1. Notify the Department of this finding in writing within seven days. The notification shall indicate what chemical parameters or hazardous constituents have shown statistically significant evidence of contamination;

2. Immediately sample the ground water in all monitoring wells and determine whether constituents in the list of 40 C.F.R. Part 264 Appendix IX are present, and if so, in what concentration;

3. For any 40 C.F.R. Part 264 Appendix IX compounds found in the analysis pursuant to (g)2 above, 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 for the compounds found pursuant to (g)2 above, the hazardous constituents found during this initial 40 C.F.R. Part 264 Appendix IX analysis shall form the basis for compliance monitoring;

4. Within 90 days after statistically significant evidence for contamination is identified, submit to the Department an application for a permit modification to establish a compliance monitoring program meeting the requirements of N.J.A.C. 7:14A-10.13. The application shall include the following information:

    i. Identification of the concentration or any 40 C.F.R. Part 264 Appendix IX constituent detected in the ground water at each monitoring well at the compliance point;

    ii. Any proposed changes to the ground water monitoring system at the facility necessary to meet the requirements of N.J.A.C. 7:14A-10.13;

    iii. Any 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 N.J.A.C. 7:14A-10.13; and

    iv. For each hazardous constituent detected at the relevant compliance point, a proposed concentration limit under N.J.A.C. 7:14A-10.8(a) 1 or 2, or a notice of intent to seek an alternate concentration limit under N.J.A.C. 7:14A-10.8(b);

5. Within 180 days after statistically significant evidence for contamination is identified, submit to the Department:

    i. All data necessary to justify an alternate concentration limit sought under N.J.A.C. 7:14A-10.8(b); and

    ii. Engineering feasibility plan for a corrective action program necessary to meet the requirement of N.J.A.C. 7:14A-10.14, unless:

        (1) All hazardous constituents identified under (g)2 above are listed in N.J.A.C. 7:14A-10.8(a)2i and their concentrations do not exceed the ground water quality criteria of N.J.A.C. 7:9C, or the 40 C.F.R. 264.94 Table 1 concentration, whichever is more stringent; or

        (2) The owner or operator has sought an alternate concentration limit under N.J.A.C. 7:14A-10.8(b) for every hazardous constituent identified under (g)2 above; and

6. If the owner or operator determines, pursuant to (f) above, that there is a statistically significant difference for chemical parameters or hazardous constituents specified pursuant to (a) above at any monitoring well at the compliance point, the owner or operator may demonstrate that a source other than the owner/operator's hazardous waste facility 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 ground water. The owner operator may make a demonstration under this paragraph in addition to, or in lieu of, submitting a permit modification application under (g)4 above; however, the owner or operator is not relieved of the requirement to submit a permit modification application within the time specified in (g)4 above unless the demonstration made under this paragraph successfully shows that a source other than a hazardous waste facility unit caused the increase, or that the increase resulted from error in sampling or analysis. In making a demonstration under this paragraph, the owner or operator shall:

i. Notify the Department in writing within seven days of determining statistically significant evidence of contamination at the relevant point of compliance that the owner or operator intends to make a demonstration under this paragraph;

ii. Within 90 days after determining statistically significant evidence of contamination, submit a report to the Department which demonstrates that a source other than a hazardous waste facility unit caused the contamination or that the contamination resulted from error in sampling or analysis;

iii. Within 90 days after receipt by the Department of the report required in ii above, submit to the Department an application for a permit modification to make any appropriate changes to the leak detection monitoring program facility; and

iv. Continue to monitor in accordance with the leak detection monitoring program established under this section.

(h) If the owner or operator determines that the leak detection monitoring program no longer satisfies the requirements of this section, the owner or operator shall, within 90 days, submit an application for a permit modification to make any appropriate changes to the leak detection monitoring program.

7:14A-10.13 Compliance monitoring program

(a) The owner or operator required to establish a compliance monitoring program under this subchapter shall monitor the ground water at the relevant point(s) of compliance to determine whether hazardous waste facility units are in compliance with the ground water protection standard under N.J.A.C. 7:14A-10.6. The Department shall specify the ground water protection standard in the NJPDES-DGW permit, including:

1. A list of the hazardous constituents identified under N.J.A.C. 7:14A-10.7;

2. Concentration limits under N.J.A.C. 7:14A-10.8 for each of those hazardous constituents;

3. The relevant point of compliance under N.J.A.C. 7:14A-10.9; and

4. The compliance period under N.J.A.C. 7:14A-10.10.

(b) The owner or operator shall install a ground water monitoring system at the compliance point as specified under N.J.A.C. 7:14A-10.9. The ground water monitoring system shall comply with N.J.A.C. 7:14A-10.11(a), (b) and (c).

(c) The Department shall specify the sampling procedures and statistical methods appropriate for the specified hazardous constituents and the facility, consistent with N.J.A.C. 7:14A-10.11(g) and (h).

1. The owner or operator shall conduct a sampling program for each chemical parameter or hazardous constituent in accordance with N.J.A.C. 7:14A-10.11(g).

2. The owner or operator shall record ground water analytical data as measured and in a form necessary for the determination of statistical significance under N.J.A.C. 7:14A-10.11(h) for the compliance period of the facility.

(d) The owner or operator shall determine whether there is statistically significant evidence of increased contamination for any chemical parameter or hazardous constituent specified pursuant to (a) above at a frequency specified under (f) below.

1. In determining whether statistically significant evidence of increased contamination exists, the owner or operator shall use the method(s) specified under N.J.A.C. 7:14A-10.11(h). The method(s) shall compare data collected at the compliance point(s) to a concentration limit developed pursuant to N.J.A.C. 7:14A-10.8.

2. The owner or operator shall 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 Department shall specify that time period in the NJPDES-DGW permit, after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of ground water samples.

(e) The owner or operator shall determine the ground water flow rate and direction in the uppermost aquifer at least annually.

(f) The Department shall specify the frequencies for collecting samples and

conducting statistical tests to determine statistically significant evidence of increased contamination in accordance with N.J.A.C. 7:14A-10.11(g). A sequence of at least four samples from each well (background and compliance wells) shall be collected at least semi-annually during the compliance period of the facility.

(g) The owner or operator shall analyze samples from all monitoring wells at the compliance point for all constituents contained in 40 C.F.R. Part 264 Appendix IX at least annually to determine whether additional hazardous constituents are present in the uppermost aquifer and, if so, at what concentration pursuant to procedures in N.J.A.C. 7:14A-10.12(f). If the owner or operator finds 40 C.F.R. Part 264 Appendix IX constituents in the ground water that are not already identified in the permit as monitoring constituents, the owner or operator may resample within one month and repeat the 40 C.F.R. 264 Appendix IX analysis. If the second analysis confirm the presence of new constituents, the owner or operator shall report the concentration of these additional constituents to the Department within seven days after the completion of the second analysis and add them to the list of constituents to be sampled for. If the owner or operator chooses not to resample, then the owner or operator shall report the concentrations of these additional constituents to the Department within seven days after completion of the initial analysis and add them to the list of constituents to be sampled for.

(h) If the owner or operator determines pursuant to (d) above that any concentration limits under N.J.A.C. 7:14A-10.8 are being exceeded at any monitoring well at the point of compliance, the owner or operator shall:

1. Notify the Department of this finding in writing within seven days. The notification shall indicate what concentration limits have been exceeded; and

2. Submit to the Department an application for a permit modification to establish a corrective action program meeting the requirements of N.J.A.C. 7:14A-10.14 within 180 days after determining that any concentration limits have been exceeded, or within 90 days after said determination if an engineering feasibility study has been previously submitted to the Department under N.J.A.C. 7:14A-10.12(h)5. The application shall, at a minimum, include the following information:

   i. A detailed description of corrective actions that shall achieve compliance with the ground water protection standard specified pursuant to (a) above; and

   ii. A plan for a ground water monitoring program that shall demonstrate the effectiveness of the corrective action. Such a ground water monitoring program may be based on a compliance monitoring program developed to meet the requirements of this section.

(i) If the owner or operator determines, pursuant to (d) above, that the ground water concentration limits under this section are being exceeded at any monitoring well at the point of compliance, the owner or operator may demonstrate that a source other than the owner/operator's hazardous waste facility 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 ground water. In making a demonstration under this paragraph, the owner or operator shall:

1. Notify the Department in writing within seven days that the owner or operator intends to make a demonstration under this paragraph;

2. Within 90 days of determining that the ground water concentration limits under this section are being exceeded, submit a report to the Department which demonstrates that a source other than a hazardous waste facility 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 after receipt by the Department of the report required in (i)2 above, submit to the Department 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 accord with the compliance monitoring program established under this section.

(j) If the owner or operator determines that the compliance monitoring program no longer satisfies the requirements of this section, the owner or operator shall, within 90 days, submit an application for a permit modification to make any appropriate changes to the program.

7:14A-10.14 Corrective action program

(a) The owner or operator required to establish a compliance monitoring program under this subchapter shall take corrective action to ensure that hazardous waste facility units are in compliance with the ground water protection standards of N.J.A.C. 7:9C. The Department shall specify the ground water protection standard in the NJPDES-DGW permit, including:

1. A list of the hazardous constituents identified under N.J.A.C. 7:14A-10.7;

2. Concentration limits under N.J.A.C. 7:14A-10.8 for each of those hazardous constituents;

3. The relevant point of compliance under N.J.A.C. 7:14A-10.9; and

4. The compliance period under N.J.A.C. 7:14A-10.10.

(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 shall specify the specific measures that shall be taken.

(c) The owner or operator shall begin corrective action within a reasonable time period after the ground water protection standard is exceeded. The Department shall specify that time period in the NJPDES-DGW permit. If a NJPDES-DGW permit includes a corrective action program in addition to a compliance monitoring program, the permit shall specify when the corrective action will begin and such a requirement will operate in lieu of N.J.A.C. 7:14A-10.13(i)2.

(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 Such a monitoring program may be based on the requirements for a compliance monitoring program under N.J.A.C. 7:14A-10.13 and shall be as effective as that program in determining compliance with the ground water protection standard under N.J.A.C. 7:14A-10.6 and in determining the success of a corrective action program under (e) below, where appropriate.

(e) In addition to the other requirements of this section, the owner or operator shall conduct a corrective action program to remove or treat in place any hazardous constituents under N.J.A.C. 7:14A-10.7 that exceed concentration limits under N.J.A.C. 7:14A-10.8 in ground water as specified in (e)1 and 2 below. Corrective action measures under this subsection shall be initiated and completed within a reasonable period of time, as specified in the NJPDES-DGW permit, considering the extent of contamination. Corrective action measures under this subsection may be terminated once the concentration of hazardous constituents under N.J.A.C. 7:14A-10.13. is reduced to levels below their respective concentration limits under N.J.A.C. 7:14A-10.8.

1. Between the compliance point under N.J.A.C. 7:14A-10.9 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 Department that, despite the owners or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such action. The owner or operator is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where offsite access is denied. Onsite measures to address such releases shall be determined on a case by case basis.

(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. If the owner or operator is conducting corrective action at the end of the compliance period, the owner or operator shall continue that corrective action for as long as necessary to achieve compliance with the ground water protection standard. The owner or operator may terminate corrective action measures taken beyond the period equal to the active life of the hazardous waste facility area (including the closure period) if the owner or operator can demonstrate, based on data from the ground water monitoring program under (d) above that the ground water protection standard of N.J.A.C. 7:14A-10.6 has not been exceeded for a period of three consecutive years.

(g) The owner or operator shall report in writing to the Department on the effectiveness of the corrective action program. The owner or operator shall submit these reports semiannually.

(h) If the owner or operator determines that the corrective action program no longer satisfies the requirements if this section, the owner or operator shall, within 90 days after said determination, submit an application for a permit modification to make any appropriate changes to the program.

7:14A-10.15 Application requirements for NJPDES-DGW permits for hazardous waste facilities

Application requirements for hazardous waste facilities are the same as those listed in N.J.A.C. 7:14A-7.9.

7:14A-10.16 Application requirements for NJPDES-DGW permits for hazardous waste facilities with surface impoundments

Application requirements for hazardous waste facility surface impoundments shall be the same as those listed in N.J.A.C. 7:14A-7.10.

7:14A-10.17 Application requirements for NJPDES-DGW permits for hazardous waste facilities with land discharge by infiltration-percolation lagoons

Application requirements for hazardous waste facility land discharge by infiltration-percolation lagoons shall be the same as those listed in N.J.A.C. 7:14A-7.13.

7:14A-10.18 Application requirements for NJPDES-DGW permits for hazardous waste landfills

Application requirements for hazardous waste landfills shall be the same as the requirements for sanitary landfills as described in N.J.A.C. 7:14A-9.12.