JCAR350811-0711112r01

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE G: WASTE DISPOSAL
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER i: SOLID WASTE AND SPECIAL WASTE HAULING

PART 811
STANDARDS FOR NEW SOLID WASTE LANDFILLS

SUBPART A: GENERAL STANDARDS FOR ALL LANDFILLS

Section

SUBPART B: INERT WASTE LANDFILLS

Section

SUBPART C: PUTRESCIBLE AND CHEMICAL WASTE LANDFILLS

Section

SUBPART G: FINANCIAL ASSURANCE

AUTHORITY: Implementing Sections 7.2, 21, 21.1, 22, 22.17, and 22.40 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/7.2, 21, 21.1, 22, 22.17, 22.40, and 27].

SOURCE: Adopted in R88-7 at 14 Ill. Reg. 15861, effective September 18, 1990; amended in R92-19 at 17 Ill. Reg. 12413, effective July 19, 1993; amended in R93-10 at 18 Ill. Reg. 1308, effective January 13, 1994; expedited correction at 18 Ill. Reg. 7504, effective July 19, 1993; amended in R90-26 at 18 Ill. Reg. 12481, effective August 1, 1994; amended in R95-13 at 19 Ill. Reg. 12257, effective August 15, 1995; amended in R96-1 at 20 Ill. Reg. 12000, effective August 15, 1996; amended in R97-20 at 21 Ill. Reg. 15831, effective November 25, 1997; amended in R98-9 at 22 Ill. Reg. 11491, effective June 23, 1998; amended in R99-1 at 23 Ill. Reg. 2794, effective February 17, 1999; amended in R98-29 at 23 Ill. Reg. 6880, effective July 1, 1999; amended in R04-5/R04-15 at 28 Ill. Reg. 9107, effective June 18, 2004; amended in R05-1 at 29 Ill. Reg. 5044, effective March 22, 2005; amended in R06-5/R06-6/R06-7 at 30 Ill. Reg. 4136, effective February 23, 2006; amended in R06-16/R06-17/R06-18 at 31 Ill. Reg. 1435, effective December 20, 2006; amended in R07-8 at 31 Ill. Reg. _____, effective _____.

SUBPART C: PUTRESCIBLE AND CHEMICAL WASTE LANDFILLS

Section 811.309 Leachate Treatment and Disposal Systems

a) Leachate shall be allowed to flow freely from the drainage and collection system. The operator is responsible for the operation of a leachate management system designed to handle all leachate as it drains from the collection system. The leachate management system shall consist of any combination of storage, treatment, pretreatment, and disposal options designed and constructed in compliance with the requirements of this Section.

b) The leachate management system shall consist of any combination of multiple treatment and storage structures, to allow the management and disposal of leachate during routine maintenance and repairs.

c) Standards for Onsite Treatment and Pretreatment

1) All onsite treatment or pretreatment systems shall be considered part of the facility.

2) The onsite treatment or pretreatment system shall be designed in accordance with the expected characteristics of the leachate. The design may include modifications to the system necessary to accommodate changing leachate characteristics.

3) The onsite treatment or pretreatment system shall be designed to function for the entire design period.

4) All of the facility's unit operations, tanks, ponds, lagoons and basins shall be designed and constructed with liners or containment structures to control seepage to groundwater.

5) All treated effluent discharged to waters of the State shall meet the requirements of 35 Ill. Adm. Code 309.

6) The treatment system shall be operated by an operator certified under the requirements of 35 Ill. Adm. Code 312.

d) Standards for Leachate Storage Systems

1) Except as otherwise provided in subsection (d)(6) of this Section, the leachate storage facility must be able to store a minimum of at least five days' worth of accumulated leachate at the maximum generation rate used in designing the leachate drainage system in accordance with Section 811.307. The minimum storage capacity may be built up over time and in stages, so long as the capacity for five consecutive days of accumulated leachate is available at any time during the design period of the facility.

2) All leachate storage tanks shall be equipped with secondary containment systems equivalent to the protection provided by a clay liner 0.61 meter (2 feet thick) having a permeability no greater than 10^{-7} centimeters per second.

3) Leachate storage systems shall be fabricated from material compatible with the leachate expected to be generated and resistant to temperature extremes.

4) The leachate storage system shall not cause or contribute to a malodor.

5) The leachate drainage and collection system shall not be used for the purpose of storing leachate.

6) A facility may have less than five days' worth of storage capacity for accumulated leachate as required by subsection (d)(1) of this Section, if the owner or operator of the facility demonstrates that multiple treatment, storage and disposal options in the facility's approved leachate management system developed in accordance with subsection (b) of this Section will achieve equivalent performance. Such options shall consist

of not less than one day's worth of storage capacity for accumulated leachate plus at least two alternative means of managing accumulated leachate through treatment or disposal, or both treatment and disposal, each of which means is capable of treating or disposing of all leachate generated at the maximum generation rate on a daily basis.

e) Standards for Discharge to an Offsite Treatment Works

1) Leachate may be discharged to an offsite treatment works that meets the following requirements:

A) All discharges of effluent from the treatment works shall meet the requirements of 35 Ill. Adm. Code 309.

B) The treatment systems shall be operated by an operator certified under the requirements of 35 Ill. Adm. Code 312.

C) No more than 50 percent of the average daily influent flow can be attributable to leachate from the solid waste disposal facility. Otherwise, the treatment works shall be considered a part of the solid waste disposal facility.

2) The operator is responsible for securing permission from the offsite treatment works for authority to discharge to the treatment works.

3) All discharges to a treatment works shall meet the requirements of 35 Ill. Adm. Code 310.

4) Pumps, meters, valves and monitoring stations that control and monitor the flow of leachate from the unit and which are under the control of the operator shall be considered part of the facility and shall be accessible to the operator at all times.

5) Leachate shall be allowed to flow into the sewage system at all times; however, if access to the treatment works is restricted or anticipated to be restricted for longer than five days, then an alternative leachate management system shall be constructed in accordance with subsection (c).

6) Where leachate is not directly discharged into a sewerage system, the operator shall provide storage capacity sufficient to transfer all leachate to an offsite treatment works. The storage system shall meet the requirements of subsection (d).

f) Standards for Leachate Recycling Systems

1) Leachate recycling systems may be utilized only at permitted waste disposal units that meet the following requirements:

A) The unit must have a liner designed, constructed and maintained to meet the minimum standards of Section 811.306.

B) The unit must have a leachate collection system in place and operating in accordance with Section 811.307.

C) A gas management system, equipped with a mechanical device such as a compressor to withdraw gas, must be implemented to control odors and prevent migration of methane in accordance with Section 811.311.

D) The topography must be such that any accidental leachate runoff can be controlled by ditches, berms or other equivalent control means.

2) Leachate shall not be recycled during precipitation events or in volumes large enough to cause runoff or surface seeps.

3) The amount of leachate added to the unit shall not exceed the ability of the waste and cover soils to transmit leachate flow downward. All other leachate shall be considered excess leachate, and a leachate management system capable of disposing of all excess leachate must be available.

4) The leachate storage and distribution system shall be designed to avoid exposure of leachate to air unless aeration or functionally equivalent devices are utilized.

5) The distribution system shall be designed to allow leachate to be evenly distributed beneath the surface over the recycle area.

6) Daily and intermediate cover shall be permeable to the extent necessary to prevent the accumulation of water and formation of perched watertables and gas buildup; alternatively cover shall be removed prior to additional waste placement.

7) Daily and intermediate cover shall slope away from the perimeter of the site to minimize surface discharges.

g) Leachate Monitoring

1) Representative samples of leachate shall be collected from each established leachate monitoring location ~~and tested~~ in accordance with subsection~~subsections~~ (g)(5) and tested for the parameters referenced in subsections (g)(2)(G) and (g)(3)(D).~~at a frequency of once per quarter until such time as samples have been obtained and tested for at least eight quarters. If for any reason insufficient leachate is obtained to yield a sample for testing during a given quarterly monitoring attempt, such attempt shall not count toward the eight quarters' leachate monitoring requirement. Thereafter, the frequency of testing shall be changed to semi-annual for any monitored constituent while the leachate management system is in operation. However,~~ The~~the~~ Agency may, by permit condition, require additional, or allow less, leachate sampling and testing as necessary to ensure compliance with this Section and Sections 811.312, 811.317, and 811.319.

2) Discharges of leachate from units that dispose of putrescible wastes shall be tested for the following constituents prior to treatment or pretreatment:

A) Five day biochemical oxygen demand (BOD_5);

B) Chemical oxygen demand;

C) Total Suspended Solids;

D) Total Iron;

E) pH;

F) Any other constituents listed in the operator's National Pollution Discharge Elimination System (NPDES) discharge permit, pursuant to 35 Ill. Adm. Code 304, or required by a publicly owned treatment works, pursuant to 35 Ill. Adm. Code 310; and

G) All the monitoring parameters listed in Section 811.Appendix C, unless an alternate monitoring list has been approved by the Agency~~of the indicator constituents chosen in accordance with Section 811.319(a)(2)(B) and used by the operator for groundwater monitoring~~.

3) Discharges of leachate from units which dispose only chemical wastes

shall be monitored for constituents determined by the characteristics of the chemical waste to be disposed of in the unit. They shall include, as a minimum:

A) pH;

B) Total Dissolved Solids;

C) Any other constituents listed in the operator's NPDES discharge permit, pursuant to 35 Ill. Adm. Code 304, or required by a publicly owned treatment works, pursuant to 35 Ill. Adm. Code 310; and

D) All the monitoring parameters listed in Section 811.Appendix C, unless an alternate monitoring list has been approved by the Agency~~of the indicator constituents chosen in accordance with Section 811.319(a)(2)(B) and used by the operator for groundwater monitoring~~.

4) A network of leachate monitoring locations shall be established, capable of characterizing the leachate produced by the unit. Unless an alternate network has been approved by the Agency, the network of leachate monitoring locations shall include:

A) At least four leachate monitoring locations; and

B) At least one leachate monitoring location for every 25 acres within the unit's waste boundaries.

5) Leachate monitoring shall be performed at least once every six months and each established leachate monitoring location shall be monitored at least once every two years.

h) Time of Operation of the Leachate Management System

1) The operator shall collect and dispose of leachate for a minimum of five years after closure and thereafter until treatment is no longer necessary.

2) Treatment is no longer necessary if the leachate constituents do not exceed the wastewater effluent standards in 35 Ill. Adm. Code 304.124, 304.125, 304.126 and do not contain a BOD_5 concentration greater than 30 mg/L for six consecutive months.

3) Leachate collection at a MSWLF unit shall be continued for a minimum period of 30 years after closure, except as otherwise provided by subsections (h)(4) and (h)(5)~~, below~~.

4) The Agency may reduce the leachate collection period at a MSWLF unit upon a demonstration by the owner or operator that the reduced period is sufficient to protect human health and environment.

5) The owner or operator of a MSWLF unit shall petition the Board for an adjusted standard in accordance with Section 811.303, if the owner or operator seeks a reduction of the postclosure care monitoring period for all of the following requirements:

i) Inspection and maintenance (Section 811.111);

ii) Leachate collection (Section 811.309);

iii) Gas monitoring (Section 811.130); and

iv) Groundwater monitoring (Section 811.319).

BOARD NOTE: Subsection (h) is derived from 40 CFR 258.61 (1992).

(Source: Amended at 31 Ill. Reg. _____, effective _____)

Section 811.315 Hydrogeologic Site Investigations

a) Purpose
The operator shall conduct a hydrogeologic investigation to develop hydrogeologic information for the following uses:

1) Provide information to perform a groundwater impact assessment; and

2) Provide information to establish a groundwater monitoring system.

b) General Requirements

1) The investigation shall be conducted in a minimum of three phases prior to submission of any application to the Agency for a permit to develop and operate a landfill facility.

2) The study area shall consist of the entire area occupied by the facility and any adjacent related areas, if necessary for the purposes of the

hydrogeological investigation set forth in subsection (a).

3) All borings shall be sampled continuously at all recognizable points of geologic variation, except that where continuous sampling is impossible or where non-continuous sampling can provide equivalent information, samples shall be obtained at intervals no greater than 1.52 meters (five feet) in homogeneous strata.

c) Minimum Requirements for a Phase I Investigation

1) The operator shall conduct a Phase I Investigation to develop the following information:

A) Climatic aspects of the study area;

B) The regional and study area geologic setting, including a description of the geomorphology and stratigraphy of the area;

C) The regional groundwater regime including water table depths and aquifer characteristics; and

D) Information for the purpose of designing a Phase II Hydrogeologic Investigation.

2) Specific Requirements

A) The regional hydrogeologic setting of the unit shall be established by using material available from all possible sources, including, but not limited to, the Illinois Scientific Surveys, the Agency, other State and Federal organizations, water well drilling logs, and previous investigations.

B) A minimum of one continuously sampled boring shall be drilled on the site, as close as feasible to the geographic center, to determine if the available regional hydrogeologic setting information is accurate and to characterize the site-specific hydrogeology to the extent specified by this phase of the investigation. The boring shall extend at least 15.2 meters (50 feet) below the bottom of the uppermost aquifer or through the full depth of the confining layer below the uppermost aquifer, or to bedrock, if the bedrock is below the upper most aquifer, whichever elevation is higher. The locations of any additional borings, required under this subsection, may be chosen by the investigator, but shall be sampled

continuously.

d) Minimum Requirements for a Phase II Investigation

1) Information to be developed
Using the information developed in the Phase I survey, a Phase II study shall be conducted to collect the site-specific information listed below as needed to augment data collected during the Phase I investigation and to prepare for the Phase III investigation:

A) Structural characteristics and distribution of underlying strata including bedrock;

B) Chemical and physical properties including, but not limited to, lithology, mineralogy, and hydraulic characteristics of underlying strata including those below the uppermost aquifer;

C) Soil characterisitics, including soil types, distribution, geochemical and geophysical characteristics;

D) The hydraulic conductivities of the uppermost aquifer and all strata above it;

E) The vertical extent of the uppermost aquifer;

F) The direction and rate of groundwater flow.

2) Specific Requirements

A) One boring shall be located as close as feasible to the topographical high point, and another shall be located as close as feasible to the topographical low point of the study area.

B) At least one boring shall be at or near each corner of the site. Where the property is irregularly shaped the borings shall be located near the boundary in a pattern and spacing necessary to obtain data over the entire study area.

C) Additional borings may be located at intermediate points at locations and spacings necessary to establish the continuity of the stratigraphic units.

D) Piezometers and groundwater monitoring wells shall be established

to determine the direction and flow characteristics of the groundwater in all strata and extending down to the bottom of the uppermost aquifer. Groundwater samples taken from such monitoring wells shall be used to develop preliminary information needed for establishing background concentrations in accordance with subsection (e)(1)(G).

E) Other methods may be utilized to confirm or accumulate additional information. Such methods may be used only as a supplement to, not in lieu of, site-specific boring information. Other methods include, but are not limited to, geophysical well logs, geophysical surveys, aerial photography, age dating, and test pits.

e) Minimum Standards For A Phase III Investigation

1) Using the information developed during the Phase I and Phase II Investigations, the operator shall conduct a Phase III Investigation. This investigation shall be conducted to collect or augment the site-specific information needed to carry out the following:

A) Verification and reconciliation of the information collected in the Phase I and II investigations;

B) Characterization of potential pathways for contaminant migration;

C) Correlation of stratigraphic units between borings;

D) Continuity of petrographic features including, but not limited to, sorting, grain size distribution, cementation and hydraulic conductivity;

E) Identification of zones of potentially high hydraulic conductivity;

F) Identification of the confining layer, if present;

G) Concentrations of chemical constituents present in the groundwater below the unit, down to the bottom of the uppermost aquifer, using a broad range of chemical analysis and detection procedures such as, gas chromatographic and mass spectrometric scanning. However, additional measurements and procedures shall be carried out to establish background concentrations, in accordance with Section 811.320(d), for:

i) Any constituent for which there is a ~~public or food processing water supply~~ standard at 35 Ill. Adm. Code 620~~302~~ established by the Board and which is expected to appear in the leachate; and

ii) Any other constituent for which there is no Board-established standard, but which is expected to appear in the leachate at concentrations above PQL, as defined in Section 811.319(a)(4)(A) for that constituent;

H) Characterization of the seasonal and temporal, naturally and artificially induced, variations in groundwater quality and groundwater flow; and

I) Identification of unusual or unpredicted geologic features, including: fault zones, fracture traces, facies changes, solution channels, buried stream deposits, cross cutting structures and other geologic features that may affect the ability of the operator to monitor the groundwater or predict the impact of the disposal facility on groundwater.

2) In addition to the specific requirements applicable to Phase~~phase~~ I and II investigations, the operator shall collect information needed to meet the minimum standards of a Phase~~phase~~ III investigation by using methods that may include, but not limited to excavation of test pits, additional borings located at intermediate points between boreholes placed during Phase~~phase~~ I and II investigations, placement of piezometers and monitoring wells, and institution of procedures for sampling and analysis.

f) The operator may conduct the hydrogeologic investigation in any number of alternative ways provided that the necessary information is collected in a systematic sequence consisting of at least three phases that is equal to or superior to the investigation procedures of this Section.

(Source: Amended at 31 Ill. Reg. _____, effective _____)

Section 811.318 Design, Construction, and Operation of Groundwater Monitoring Systems

a) All potential sources of discharges to groundwater within the facility, including, but not limited to, all waste disposal units and the leachate management system, shall be identified and studied through a network of monitoring wells operated during the active life of the unit and for the time after closure specified in accordance with Section 811.319. Monitoring wells designed and constructed as

part of the monitoring network shall be maintained along with records that include, but are not limited to, exact well location, well size, type of well, the design and construction practice used in its installation and well and screen depths.

b) Standards for the Location of Monitoring Points

1) A network of monitoring points shall be established at sufficient locations downgradient with respect to groundwater flow and not excluding the downward direction, to detect any discharge of contaminants from any part of a potential source of discharge.

2) Monitoring wells shall be located in stratigraphic horizons that could serve as contaminant migration pathways.

3) Monitoring wells shall be established as close to the potential source of discharge as possible without interfering with the waste disposal operations, and within half the distance from the edge of the potential source of discharge to the edge of the zone of attenuation downgradient, with respect to groundwater flow, from the source.

4) The network of monitoring points of several potential sources of discharge within a single facility may be combined into a single monitoring network, provided that discharges from any part of all potential sources can be detected.

5) A minimum of at least one monitoring well shall be established at the edge of the zone of attenuation and shall be located downgradient with respect to groundwater flow and not excluding the downward direction, from the unit. Such well or wells shall be used to monitor any statistically significant increase in the concentration of any constituent, in accordance with Section 811.320(e) and shall be used for determining compliance with an applicable groundwater quality standard of Section 811.320. An observed statistically significant increase above the applicable groundwater quality standards of Section 811.320 in a well located at or beyond the compliance boundary shall constitute a violation.

c) Maximum Allowable Predicted Concentrations

The operator shall use the same calculation methods, data, and assumptions as used in the groundwater impact assessment to predict the concentration over time and space of all constituents chosen to be monitored in accordance with Section 811.319 at all monitoring points. The predicted values shall be used to establish the maximum allowable predicted concentrations (MAPC) at each monitoring

point. The MAPCs calculated in this subsection shall be applicable within the zone of attenuation.

d) Standards for Monitoring Well Design and Construction

1) All monitoring wells shall be cased in a manner that maintains the integrity of the bore hole. The casing material shall be inert so as not to affect the water sample. Casing requiring solvent-cement type couplings shall not be used.

2) Wells shall be screened to allow sampling only at the desired interval. Annular space between the borehole wall and well screen section shall be packed with gravel sized to avoid clogging by the material in the zone being monitored. The slot size of the screen shall be designed to minimize clogging. Screens shall be fabricated from material expected to be inert with respect to the constituents of the groundwater to be sampled.

3) Annular space above the well screen section shall be sealed with a relatively impermeable, expandable material such as a cement/bentonite grout, which does not react with or in any way affect the sample, in order to prevent contamination of samples and groundwater and avoid interconnections. The seal shall extend to the highest known seasonal groundwater level.

4) The annular space shall be back-filled with expanding cement grout from an elevation below the frost line and mounded above the surface and sloped away from the casing so as to divert surface water away.

5) The annular space between the upper and lower seals and in the unsaturated zone may be back-filled with uncontaminated cuttings.

6) All wells shall be covered with vented caps and equipped with devices to protect against tampering and damage.

7) All wells shall be developed to allow free entry of water, minimize turbidity of the sample, and minimize clogging.

8) The transmissivity of the zone surrounding all well screens shall be established by field testing techniques.

9) Other sampling methods and well construction techniques may be utilized if they provide equal or superior performance to the requirements of this subsection.

e) Standards for Sample Collection and Analysis

1) The groundwater monitoring program shall include consistent sampling and analysis procedures to assure that monitoring results can be relied upon to provide data representative of groundwater quality in the zone being monitored.

2) The operator shall utilize procedures and techniques to insure that collected samples are representative of the zone being monitored and that prevent cross contamination of samples from other monitoring wells or from other samples. At least 95 percent of a collected sample shall consist of groundwater from the zone being monitored.

3) The operator shall establish a quality assurance program that provides quantitative detection limits and the degree of error for analysis of each chemical constituent.

4) The operator shall establish a sample preservation and shipment procedure that maintains the reliability of the sample collected for analysis.

5) The operator shall institute a chain of custody procedure to prevent tampering and contamination of the collected samples prior to completion of analysis.

6) At a minimum, the operator shall sample the following parameters at all wells at the time of sample collection and immediately before filtering and preserving samples for shipment:

A) The elevation of the water table;

~~B) The depth of the well below ground;~~

BC) pH;

CD) The temperature of the sample; and

DE) Specific Conductance.

7) The operator must measure the depth of the well below ground on an annual basis, at wells that do not contain dedicated pumps. The operator must measure the depth of the well below ground every 5 years, or whenever the pump is pulled, in wells with dedicated pumps.

8~~7~~) In addition to the requirements of subsections (e)(1) through (e)(6), the following requirements shall apply to MSWLF units:

A) Each time groundwater is sampled, an owner or operator of a MSWLF unit shall:

i) Measure the groundwater elevations in each well immediately prior to purging; and

ii) Determine the rate and direction of ground-water flow.

B) An owner or operator shall measure groundwater elevations in wells which monitor the same waste management area within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater flow rate and direction.

BOARD NOTE: Subsection (e)(7) is derived from 40 CFR 258.53(d) (1992).

(Source: Amended at 31 Ill. Reg. _____, effective _____)

Section 811.319 Groundwater Monitoring Programs

a) Detection Monitoring Program
Any use of the term maximum allowable predicted concentration in this Section is a reference to Section 811.318(c). The operator shall implement a detection monitoring program in accordance with the following requirements:

1) Monitoring Schedule and Frequency

A) The monitoring period shall begin as soon as waste is placed into the unit of a new landfill or within one year of the effective date of this Part for an existing landfill. Monitoring shall continue for a minimum period of fifteen years after closure, or in the case of MSWLF units, a minimum period of 30 years after closure, except as otherwise provided by subsection (a)(1)(C) of this Section. The operator shall sample all monitoring points for all potential sources of contamination on a quarterly basis except as specified in subsection (a)(3), for a period of five years from the date of issuance of the initial permit for significant modification under 35 Ill. Adm. Code 814.104 or a permit for a new unit pursuant to 35

Ill. Adm. Code 813.104. After the initial five-year period, the sampling frequency for each monitoring point shall be reduced to a semi-annual basis, provided the operator has submitted the certification described in 35 Ill. Adm. Code 813.304(b). Alternatively, after the initial five-year period, the Agency shall allow sampling on a semi-annual basis where the operator demonstrates that monitoring effectiveness has not been compromised, that sufficient quarterly data has been collected to characterize groundwater, and that leachate from the monitored unit does not constitute a threat to groundwater. For the purposes of this Section, the source shall be considered a threat to groundwater if the results of the monitoring indicate either that the concentrations of any of the constituents monitored within the zone of attenuation is above the maximum allowable predicted concentration for that constituent or, for existing landfills, subject to 35 Ill. Adm. Code 814, Subpart D, that the concentration of any constituent has exceeded the applicable standard at the compliance boundary as defined in 35 Ill. Adm. Code 814.402(b)(3).

B) Beginning fifteen years after closure of the unit, or five years after all other potential sources of discharge no longer constitute a threat to groundwater, as defined in subsection (a)(1)(A), the monitoring frequency may change on a well by well basis to an annual schedule if either of the following conditions exist. However, monitoring shall return to a quarterly schedule at any well where a statistically significant increase is determined to have occurred in accordance with Section 811.320(e), in the concentration of any constituent with respect to the previous sample.

i) All constituents monitored within the zone of attenuation have returned to a concentration less than or equal to ten percent of the maximum allowable predicted concentration; or

ii) All constituents monitored within the zone of attenuation are less than or equal to their maximum allowable predicted concentration for eight consecutive quarters.

C) Monitoring shall be continued for a minimum period of: 30~~thirty~~ years after closure at MSWLF units, except as otherwise provided by subsections (a)(1)(D) and (a)(1)(E)~~, below~~; five years after closure at landfills, other than MSWLF units, which are used exclusively for disposing waste generated at the site; or 15~~fifteen~~

years after closure at all other landfills regulated under this Part. Monitoring, beyond the minimum period, may be discontinued under the following conditions:

i) No statistically significant increase is detected in the concentration of any constituent above that measured and recorded during the immediately preceding scheduled sampling for three consecutive years, after changing to an annual monitoring frequency; or

ii) Immediately after contaminated leachate is no longer generated by the unit.

D) The Agency may reduce the groundwater monitoring period at a MSWLF unit upon a demonstration by the owner or operator that the reduced period is sufficient to protect human health and environment.

E) An owner or operator of a MSWLF unit shall petition the Board for an adjusted standard in accordance with Section 811.303, if the owner or operator seeks a reduction of the postclosure care monitoring period for all of the following requirements:

i) Inspection and maintenance (Section 811.111);

ii) Leachate collection (Section 811.309);

iii) Gas monitoring (Section 811.310); and

iv) Groundwater monitoring (Section 811.319).

BOARD NOTE: Changes to subsections (a)(1)(A) and (a)(1)(C), and subsections (a)(1)(D) and (a)(1)(E) are derived from 40 CFR 258.61 (1992).

2) Criteria for Choosing Constituents to be Monitored

A) The operator shall monitor each well for constituents that will provide a means for detecting groundwater contamination. Constituents shall be chosen for monitoring if they meet the following requirements:

i) The constituent appears in, or is expected to be in, the

leachate; and

ii) Is contained within the following list of constituents:

Ammonia – Nitrogen (dissolved)
Arsenic (dissolved)
Boron (dissolved)
Cadmium (dissolved)
Chloride (dissolved)
Chromium (dissolved)
Cyanide (total)
Lead (dissolved)
Magnesium (dissolved)
Mercury (dissolved)
Nitrate (dissolved)
Sulfate (dissolved)
Total Dissolved Solids (TDS)
Zinc (dissolved)

iii) This is the minimum list for MSWLFs.

iv) Any facility accepting more than 50% by volume non-municipal must determine additional indicator parameters based upon leachate characteristic and waste content.

~~ii) The Board has established for the constituent a public or food processing water supply standard, at 35 Ill. Adm. Code 302, the Board has established a groundwater quality standard under the Illinois Groundwater Protection Act [415 ILCS 55], or the constituent may otherwise cause or contribute to groundwater contamination.~~

B) One or more indicator constituents, representative of the transport processes of constituents in the leachate, may be chosen for monitoring in place of the constituents it represents. The use of such indicator constituents must be included in an Agency approved permit.

3) Organic Chemicals Monitoring
The operator shall monitor each existing well that is being used as a part of the monitoring well network at the facility within one year of the effective date of this Part, and monitor each new well within the three months of its establishment. The monitoring required by this subsection

(a)(3) shall be for a broad range of organic chemical contaminants in accordance with the procedures described below:

A) The analysis shall be at least as comprehensive and sensitive as the tests for the~~;i)The~~ 51 organic chemicals in drinking water described at 40 CFR 141.40 (1988) and 40 CFR 258.Appendix I (2006), incorporated by reference at 35 Ill. Adm. Code 810.104~~;~~ and:

Acetone
Acrylonitrile
Benzene
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform; Tribromomethane
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane
Chloroform; Trichloromethane
o-Chlorotoluene
p-Chlorotoluene
Dibromochloromethane
1,2-Dibromo-3-chloropropane
1,2-Dibromoethane
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane

1,1-Dichloroethylene
cis-1,2-Dichloroethylene
trans-1,2-Dicloroethylene
1,2-Dichloropropane
1,3-Dichloropropane
2,2-Dichloropropane
1,1-Dichloropropene
1,3-Dichloropropene
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Ethylbenzene
Hexachlorobutadiene
2-Hexanone; Methyl butyl ketone
Isopropylbenzene
p-Isopropyltoluene
Methyl bromide; Bromomethane
Methyl chloride; Chloromethane
Methylene bromide; Dibromomethane
Dichloromethane
Methyl ethyl ketone
Methyl iodide; Iodomethane
4-Methyl-2-pentanone
Naphthalene
Oil and Grease (hexane soluble)
n-Propylbenzene
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene
Tetrahydrofuran
Toluene
Total Phenolics
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane

1,1,2-Trichloroethane
Trichloroethylene
Trichlorofluoromethane
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl acetate
Vinyl chloride
Xylenes

~~ii)~~ ~~Any other organic chemical for which a groundwater quality standard or criterion has been adopted pursuant to Section 14.4 of the Act or Section 8 of the Illinois Groundwater Protection Act.~~

B) At least once every two years, the operator shall monitor each well in accordance with subsection (a)(3~~1~~)(A).

C) The operator of a MSWLF unit shall monitor each well in accordance with subsection (a)(3~~1~~)(A) on a semi-annual~~an annual~~ basis.

BOARD NOTE: Subsection (a)(3)(C) is derived from 40 CFR 258.54(b) (1992).

4) Confirmation of Monitored Increase

A) The confirmation procedures of this subsection shall be used only if the concentrations of the constituents monitored can be measured at or above the practical quantitation limit (PQL). The PQL is defined as the lowest concentration that can be reliably measured within specified limits of precision and accuracy, under routine laboratory operating conditions. The operator shall institute the confirmation procedures of subsection (a)(4)(B) after notifying the Agency in writing, within ten days, of observed increases:

i) The concentration of any inorganic constituent monitored in accordance with subsections~~subsection~~ (a)(1) and (a)(2) shows a progressive increase over eight~~four~~ consecutive monitoring events;

ii) The concentration of any constituent exceeds the maximum allowable predicted concentration at an established monitoring point within the zone of attenuation;

iii) The concentration of any constituent monitored in accordance with subsection (a)(3) exceeds the preceding measured concentration at any established monitoring point; and

iv) The concentration of any constituent monitored at or beyond the zone of attenuation exceeds the applicable groundwater quality standards of Section 811.320.

B) The confirmation procedures shall include the following:

i) The operator shall verify any observed increase by taking additional samples within 9045 days aftero~~f~~ the initial sampling event~~observation~~ and ensure that the samples and sampling protocol used will detect any statistically significant increase in the concentration of the suspect constituent in accordance with Section 811.320(e), so as to confirm the observed increase. The operator shall notify the Agency of any confirmed increase before the end of the next business day following the confirmation.

ii) The operator shall determine the source of any confirmed increase, which may include, but shall not be limited to, natural phenomena, sampling or analysis errors, or an offsite source.

iii) The operator shall notify the Agency in writing of any confirmed increase. The notification must demonstrate a source other than the facility ~~and state the source of the confirmed increase~~ and provide the rationale used in such a determination. The notification must be submitted to the Agency no later than 180 days after the original sampling event. If the facility is permitted by the Agency, the notification must be filed for review as a significant permit modification pursuant to 35 Ill. Adm. Code 813.Subpart B~~within ten days of the determination~~.

iv) If an alternative source demonstration described in subsections (a)(4)(B)(ii) and (iii) of this Section cannot be made, assessment monitoring is required in accordance with subsection (b) of this Section.

v) If an alternative source demonstration, submitted to the Agency as an application, is denied pursuant to 35 Ill. Adm. Code 813.105, the operator must commence sampling for the constituents listed in subsection (b)(5) of this Section, and submit an assessment monitoring plan as a significant permit modification, both within 30 days after the dated notification of Agency denial. The operator must sample the well or wells that exhibited the confirmed increase.

b) Assessment Monitoring

The operator shall begin an assessment monitoring program in order to confirm that the solid waste disposal facility is the source of the contamination and to provide information needed to carry out a groundwater impact assessment in accordance with subsection (c). The assessment monitoring program shall be conducted in accordance with the following requirements:

1) The assessment monitoring shall be conducted in accordance with this subsection to collect information to assess the nature and extent of groundwater contamination. The owner or operator of a MSWLF unit shall comply with the additional requirements prescribed in subsection (b)(5). The assessment monitoring shall consist of monitoring of additional constituents that might indicate the source and extent of contamination. In addition, assessment monitoring may include any other investigative techniques that will assist in determining the source, nature and extent of the contamination, which may consist of, but need not be limited to:

A) More frequent sampling of the wells in which the observation occurred;

B) More frequent sampling of any surrounding wells; and

C) The placement of additional monitoring wells to determine the source and extent of the contamination.

2) Except as provided for in subsections (a)(4)(B)(iii) and (v) of this Section, the~~The~~ operator of the facility for which assessment monitoring is required

shall file the plans for an assessment monitoring program with the Agency. If the facility is permitted by the Agency, then the plans shall be filed for review as a significant permit modification pursuant to 35 Ill. Adm. Code 813.Subpart B within 180 days after the original sampling event. The assessment monitoring program shall be implemented within 18090 days aftero~~f~~ the original sampling event~~confirmation of any monitored increase~~ in accordance with subsection (a)(4) or, in the case of permitted facilities, within 4590 days aftero~~f~~ Agency approval.

3) If the analysis of the assessment monitoring data shows that the concentration of one or more constituents, monitored at or beyond the zone of attenuation is above the applicable groundwater quality standards of Section 811.320 and is attributable to the solid waste disposal facility, then the operator shall determine the nature and extent of the groundwater contamination including an assessment of the potential impact on the groundwater should waste continue to be accepted at the facility and shall implement the remedial action in accordance with subsection (d).

4) If the analysis of the assessment monitoring data shows that the concentration of one or more constituents is attributable to the solid waste disposal facility and exceeds the maximum allowable predicted concentration within the zone of attenuation, then the operator shall conduct a groundwater impact assessment in accordance with the requirements of subsection (c).

5) In addition to the requirements of subsection (b)(1), to collect information to assess the nature and extent of groundwater contamination, the following requirements are applicable to MSWLF units:

A) The monitoring of additional constituents pursuant to subsection (b)(1)~~(A)~~ mustshall include, at a minimum (except as otherwise provided in subsection (b)(5)(E) of this Section), the constituents listed in 40 CFR 258.Appendix II, incorporated by reference at 35 Ill. Adm. Code 810.104 and constituents from 35 Ill. Adm. Code 620.410.

BOARD NOTE: Subsection (b)(5)(A) is derived from 40 CFR 258.55(b) (1992).

B) Within 14 days aftero~~f~~ obtaining the results of sampling required under subsection (b)(5)(A), the owner or operator shall:

i) Place a notice in the operating record identifying the

constituents that have been detected; and

ii) Notify the Agency that such a notice has been placed in the operating record.

BOARD NOTE: Subsection (b)(5)(B) is derived from 40 CFR 258.55(d)(1) (1992).

C) The owner or operator shall establish background concentrations for any constituents detected pursuant to subsection (b)(5)(A) in accordance with Section 811.320(e).

BOARD NOTE: Subsection (b)(5)(C) is derived from 40 CFR 258.55(d)(3) (1992).

D) Within 90 days after~~of~~ the initial monitoring in accordance with subsection (b)(5)(A), the owner or operator must~~shall~~ monitor for the detected constituents listed in 40 CFR 258.Appendix II and 35 Ill. Adm. Code 620.410 on a semiannual basis during the assessment monitoring. The operator must monitor all the constituents listed in 40 CFR 258.Appendix II and 35 Ill. Adm. Code 620.410 on an annual basis during assessment monitoring.

BOARD NOTE: Subsection (b)(5)(D) is derived from 40 CFR 258.55(d)(2) (1992).

E) The owner or operator may request the Agency to delete any of the 40 CFR 258.Appendix II and 35 Ill. Adm. Code 620.410 constituents by demonstrating to the Agency that the deleted constituents are not reasonably expected to be in or derived from the waste contained in the leachate.

BOARD NOTE: Subsection (b)(5)(E) is derived from 40 CFR 258.55(b) (1992).

F) Within 14 days after~~of~~ finding an exceedance above the applicable groundwater quality standards in accordance with subsection (b)(3), the owner or operator shall:

i) Place a notice in the operating record that identifies the constituents monitored under subsection (b)(1)(D) that have exceeded the groundwater quality standard;

ii) Notify the Agency and the appropriate officials of the local municipality or county within whose boundaries the site is located that such a notice has been placed in the operating record; and

iii) Notify all persons who own land or reside on land that directly overlies any part of the plume of contamination if contaminants have migrated off-site.

BOARD NOTE: Subsection (b)(5)(F) is derived from 40 CFR 258.55(g)(1)(i) through (iii) (1992).

G) If the concentrations of all 40 CFR 258.Appendix II and 35 Ill. Adm. Code 620.410 constituents are shown to be at or below background values, using the statistical procedures in Section 811.320(e), for two consecutive sampling events, the owner or operator shall notify the Agency of this finding and may stop monitoring the 40 CFR 258.Appendix II and 35 Ill. Adm. Code 620.410 constituents.

BOARD NOTE: Subsection (b)(5)(G) is derived from 40 CFR 258.55(e) (1992).

c) Assessment of Potential Groundwater Impact. An operator required to conduct a groundwater impact assessment in accordance with subsection (b)(4) shall assess the potential impacts outside the zone of attenuation that may result from confirmed increases above the maximum allowable predicted concentration within the zone of attenuation, attributable to the facility, in order to determine if there is need for remedial action. In addition to the requirements of Section 811.317, the following shall apply:

1) The operator shall utilize any new information developed since the initial assessment and information from the detection and assessment monitoring programs and such information may be used for the recalibration of the GCT model; and

2) The operator shall submit the groundwater impact assessment and any proposed remedial action plans determined necessary pursuant to subsection (d) to the Agency within 180 days after~~of~~ the start of the assessment monitoring program.

d) Remedial Action. The owner or operator of a MSWLF unit shall conduct corrective action in accordance with Sections 811.324, 811.325, and 811.326.

The owner or operator of a landfill facility, other than a MSWLF unit, shall conduct remedial action in accordance with this subsection.

1) The operator shall submit plans for the remedial action to the Agency. Such plans and all supporting information including data collected during the assessment monitoring shall be submitted within 90 days after~~of~~ determination of either of the following:

   A) The~~the~~ groundwater impact assessment, performed in accordance with subsection (c), indicates that remedial action is needed; or

   B) Any confirmed increase above the applicable groundwater quality standards of Section 811.320 is determined to be attributable to the solid waste disposal facility in accordance with subsection (b).

2) If the facility has been issued a permit by the Agency, then the operator shall submit this information as an application for significant modification to the permit;

3) The operator shall implement the plan for remedial action program within 90 days after~~of~~ the following:

   A) Completion of the groundwater impact assessment that requires remedial action;

   B) Establishing that a violation of an applicable groundwater quality standard of Section 811.320 is attributable to the solid waste disposal facility in accordance with subsection (b)(3); or

   C) Agency approval of the remedial action plan, where the facility has been permitted by the Agency.

4) The remedial action program shall consist of one or a combination of one of more of the following solutions:

   A) Retrofit additional groundwater protective measures within the unit;

   B) Construct an additional hydraulic barrier, such as a cutoff wall or slurry wall system

   C) Pump and treat the contaminated groundwater; or

D) Any other equivalent technique which will prevent further contamination of groundwater.

5) Termination of the Remedial Action Program

A) The remedial action program shall continue in accordance with the plan until monitoring shows that the concentrations of all monitored constituents are below the maximum allowable predicted concentration within the zone of attenuation, below the applicable groundwater quality standards of Section 811.320 at or beyond the zone of attenuation, over a period of four consecutive quarters no longer exist.

B) The operator shall submit to the Agency all information collected under subsection (d)(5)(A). If the facility is permitted then the operator shall submit this information as a significant modification of the permit.

(Source: Amended at 31 Ill. Reg. _____, effective _____)

Section 811.320 Groundwater Quality Standards

a) Applicable Groundwater Quality Standards

1) Groundwater quality shall be maintained at each constituent's background concentration, at or beyond the zone of attenuation. The applicable groundwater quality standard established for any constituent shall be:

A) The background concentration; or

B) The Board established standard adjusted by the Board in accordance with the justification procedure of subsection (b).

2) Any statistically significant increase above an applicable groundwater quality standard established pursuant to subsection (a) that is attributable to the facility and which occurs at or beyond the zone of attenuation within 100 years after closure of the last unit accepting waste within such a facility shall constitute a violation.

3) For the purposes of this Part:

A) "Background concentration" means that concentration of a constituent that is established as the background in accordance

with subsection (d); and

B) "Board established standard" is the concentration of a constituent adopted by the Board as a ~~standard for public and food processing water supplies under 35 Ill. Adm. Code 302 or as a~~ groundwater quality standard adopted by the Board pursuant to Section 14.4 of the Act or Section 8 of the Illinois Groundwater Protection Act~~, whichever is lower~~.

b) Justification for Adjusted Groundwater Quality Standards

1) An operator may petition the Board for an adjusted groundwater quality standard in accordance with the procedures specified in Section 28.1 of the Act and 35 Ill. Adm. Code 104.400, Subpart D~~106.410 through 106.416~~.

2) For groundwater which contains naturally occurring constituents which meet the applicable requirements of 35 Ill. Adm. Code 620.410, 620.420, 620.430, or 620.440~~302.301, 302.304, and 302.305~~, the Board will specify adjusted groundwater quality standards no greater than those of 35 Ill. Adm. Code 620.410, 620.420, 620.430, or 620.440, respectively,~~302.301, 302.304, and 302.305,~~ upon a demonstration by the operator that:

A) The change in standards will not interfere with, or become injurious to, any present or potential beneficial uses for such water;

B) The change in standards is necessary for economic or social development, by providing information including, but not limited to, the impacts of the standards on the regional economy, social disbenefits such as loss of jobs or closing of landfills, and economic analysis contrasting the health and environmental benefits with costs likely to be incurred in meeting the standards; and

C) All technically feasible and economically reasonable methods are being used to prevent the degradation of the groundwater quality.

3) Notwithstanding subsection (b)(2), in no case shall the Board specify adjusted groundwater quality standards for a MSWLF unit greater than the following levels~~ set forth below~~:

Chemical	Concentration (mg/1)
Arsenic	0.05

Barium	1.0
Benzene	0.005
Cadmium	0.01
Carbon tetrachloride	0.005
2,4-Dichlorophenoxy acetic acid	0.05
1,4-Dichlorobenzene	0.1
1,2-Dichloroethane	0.075
1,1-Dichloroethylene	0.005
Endrin	0.007
Fluoride	0.0002
Lindane	4
Lead	0.004
Mercury	0.05
Methoxychlor	0.002
Nitrate	0.1
Selenium	10
Silver	0.01
Toxaphene	0.05
1,1,1-Trichloromethane	0.005
Thrichloroethylene	0.2
2,4,5-Trichlorophenoxy acetic acid	0.005
Vinyl Chloride	0.01

4) For groundwater which contains naturally occurring constituents which do not meet the standards of 35 Ill. Adm. Code 620.410, 620.420, 620.430, or 620.440~~302.301, 302.304, and 302.305~~, the Board will specify adjusted groundwater quality standards, upon a demonstration by the operator that:

A) The groundwater does not presently serve as a source of drinking water;

B) The change in standards will not interfere with, or become injurious to, any present or potential beneficial uses for such waters;

C) The change in standards is necessary for economic or social development, by providing information including, but not limited to, the impacts of the standards on the regional economy, social disbenefits such as loss of jobs or closing of landfills, and economic analysis contrasting the health and environmental benefits with costs likely to be incurred in meeting the standards; and

D) The groundwater cannot presently, and will not in the future, serve as a source of drinking water because:

i) It is impossible to remove water in usable quantities;

ii) The groundwater is situated at a depth or location such that recovery of water for drinking purposes is not technologically feasible or economically reasonable;

iii) The groundwater is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption;

iv) The total dissolved solids content of the groundwater is more than 3,000 mg/l and that water will not be used to serve a public water supply system; or

v) The total dissolved solids content of the groundwater exceeds 10,000 mg/l.

c) Determination of the Zone of Attenuation

1) The zone of attenuation, within which concentrations of constituents in leachate discharged from the unit may exceed the applicable groundwater quality standard of this Section, is a volume bounded by a vertical plane at the property boundary or 100 feet from the edge of the unit, whichever is less, extending from the ground surface to the bottom of the uppermost aquifer and excluding the volume occupied by the waste.

2) Zones of attenuation shall not extend to the annual high water mark of navigable surface waters.

3) Overlapping zones of attenuation from units within a single facility may be combined into a single zone for the purposes of establishing a monitoring network.

d) Establishment of Background Concentrations

1) The initial monitoring to determine background concentrations shall commence during the hydrogeological assessment required by Section 811.315. The background concentrations for those parameters identified in Sections 811.315(e)(1)(G) and 811.319(a)(2) and (a)(3) shall be established based on consecutive quarterly sampling of wells for a

minimum of one year, monitored in accordance with the requirements of subsections (d)(2), (d)(3) and (d)(4). Non-consecutive data may be considered by the Agency, if only one data point from a quarterly event is missing, and it can be demonstrated that the remaining data set is representative of consecutive data in terms of any seasonal or temporal variation.~~, which may be adjusted during the operation of a facility.~~ Statistical tests and procedures shall be employed, in accordance with subsection (e), depending on the number, type and frequency of samples collected from the wells, to establish the background concentrations.

2) Adjustments to the background concentrations shall be made ~~only~~ if changes in the concentrations of constituents observed in background~~upgradient~~ wells over time are determined, in accordance with subsection (e), to be statistically significant, and due to natural temporal or spatial variability or due to an off-site source not associated with the landfill or the landfill activities. Such adjustments may be conducted no more frequently than once every two years during the operation of a facility and modified subject to approval by the Agency. Non-consecutive data may be used for an adjustment upon Agency approval. Adjustments to the background concentration shall not be initiated prior to 2 years after final rule unless required by the Agency.

3) Background concentrations determined in accordance with this subsection shall be used for the purposes of establishing groundwater quality standards, in accordance with subsection (a). The operator shall prepare a list of the background concentrations established in accordance with this subsection. The operator shall maintain such a list at the facility, shall submit a copy of the list to the Agency for establishing standards in accordance with subsection (a), and shall provide updates to the list within ten days of any change to the list.

~~4~~2) A network of monitoring wells shall be established upgradient from the unit, with respect to groundwater flow, in accordance with the following standards, in order to determine the background concentrations of constituents in the groundwater:

A) The wells shall be located at such a distance that discharges of contaminants from the unit will not be detectable;

B) The wells shall be sampled at the same frequency as other monitoring points to provide continuous background concentration data, throughout the monitoring period; and

C) The wells shall be located at several depths to provide data on the spatial variability.

5~~3~~) A determination of background concentrations may include the sampling of wells that are not hydraulically upgradient of the waste unit where:

A) Hydrogeologic conditions do not allow the owner or operator to determine what wells are hydraulically upgradient of the waste; and

B) Sampling at other wells will provide an indication of background concentrations that is representative of that which would have been provided by upgradient wells.

6~~4~~) If background concentrations cannot be determined on site, then alternative background concentrations may be determined from actual monitoring data from the aquifer of concern, which includes, but is not limited to, data from another landfill site that overlies the same aquifer.

e) Statistical Analysis of Groundwater Monitoring Data

1) Statistical tests shall be used to analyze groundwater monitoring data. One or more of the normal theory statistical tests ~~listed in subsection (e)(4)~~ shall be chosen first for analyzing the data set or transformations of the data set. Where such normal theory tests are inappropriate, tests listed in subsection (e)(4)~~(5) or a test in accordance with subsection (e)(6)~~ shall be used. The~~Any statistical test chosen from subsections (e)(4) or (e)(5), the~~ level of significance (Type I error level) shall be no less than 0.01, for individual well comparisons, and no less than 0.05, for multiple well comparisons. The statistical analysis shall include, but not be limited to, the accounting of data below the detection limit of the analytical method used, the establishment of background concentrations and the determination of whether statistically significant changes have occurred in:

A) The concentration of any chemical constituent with respect to the background concentration or maximum allowable predicted concentration; and

B) The established background concentration of any chemical constituents over time.

2) The statistical test or tests used shall be based upon the sampling and

collection protocol of Sections 811.318 and 811.319.

3) Monitored data that are below the level of detection shall be reported as not detected (ND). The level of detection for each constituent shall be the practical quantitation limit (PQL), and shall be the lowest~~minimum~~ concentration that is protective of human health and the environment, and can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions. In no case shall the PQL be established above the level that the Board has established for a groundwater quality standard under the Illinois Groundwater Protection Act [415 ILCS 55]. The following procedures shall be used to analyze such data, unless an alternative procedure in accordance with subsection (e)(~~4~~6), is shown to be applicable:

A) Where the percentage of nondetects in the data base used is less than 15 percent, the operator shall replace NDs with the PQL~~MDL~~ divided by two, then proceed with the use of one or more of the Normal Theory statistical tests ~~listed in subsection (e)(4)~~;

B) Where the percentage of nondetects in the data base ~~or data transformations~~ used is between 15 and 50 percent, and the data are normally distributed, the operator shall use Cohen's or Aitchison's adjustment to the sample mean and standard deviation, followed by an applicable statistical procedure~~one or more of the tests listed in subsection (e)(4)(C). However, where data are not normally distributed, the operator shall use an applicable nonparametric test from subsection (e)(5)~~;

C) Where the percentage of nondetects in the database used is above 50 percent, then the owner or operator shall use an alternative procedure in accordance with~~the test of proportions listed in~~ subsection (e)(4).

4) ~~Normal theory statistical tests:A)Student t-test including, but not limited to, Cochran's Approximation to the Behren-Fisher (CABF) t-test and Averaged Replicate (AR) t-test.B)Parametric analysis of variance (ANOVA) followed by one or more of the multiple comparison procedures including, but not limited to, Fisher's Least Significant Difference (LSD), Student-Newman-Kuel procedure, Duncan's New Multiple Range Test and Tukey's W procedure.C)Control Charts, Prediction Intervals and Tolerance Intervals, for which the Type I error levels shall be specified by the Agency in accordance with the requirements of 35 Ill. Adm. Code 724.197(i).5)~~Nonparametric statistical

tests ~~shall include: Mann-Whitney U-test, Kruskal-Wallis test, a nonparametric analysis of variance (ANOVA) for multiple comparisons or the Wilcoxon Rank-Sum test.6)~~or any~~Any~~ other statistical test ~~based on the distribution of the sampling data may be used~~, if it is demonstrated to meet the requirements of 35 Ill. Adm. Code 724.197(i).

BOARD NOTE: Subsection (b)(3) is derived from 40 CFR 258.40 Table 1. (1992).

(Source: Amended at 31 Ill. Reg. _____, effective _____)

1488 **Section 811.APPENDIX C List of Leachate Monitoring Parameters**
1489

pH
Elevation Leachate Surface
Bottom of Well Elevation
Leachate Level from Measuring Point
Arsenic (total)
Barium (total)
Cadmiun (total) mg/l
Iron (total)
Ammonia Nitrogen – N
Bacteria (Fecal Coliform)
Biochemical Oxygen Demand (BOD_5)
1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethylene
1,1-Dichloropropene
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dibromo-3-Chloropropane
1,2-Dichloroethane
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichloropropane
1,3-Dichloropropene
1,4-Dichloro-2-Butene
1-Propanol
2,2-Dichloropropane
2,4,5-tp (Silvex)

2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dichlorophenoxyacetic Acid (2,4-D)
2,4-Dimethylphenol
2,4-Dinitrotoluene
2,4-Dinitrophenol
2,6-Dinitrotoluene
2-Chloroethyl Vinyl Ether
2-Chloronaphthalene
2-Chlorophenol
2-Hexanone
2-Propanol (Isopropyl Alcohol)
3,3-Dichlorobenzidine
4,4-DDD
4,4-DDE
4,4-DDT
4,6-Dinitro-O-Cresol
4-Bromophenyl Phenyl Ether
4-Chlorophenyl Phenyl Ether
4-Methyl-2-Pentanone
4-Nitrophenol
Acenaphthene
Acetone
Alachlor
Aldicarb
Aldrin
Alpha – BHC
Aluminum
Anthracene
Antimony
Atrazine
Benzene
Benzo (a) Anthracene

Benzo (a) Pyrene
Benzo (b) Fluoranthene
Benzo (ghi) Perylene
Benzo (k) Fluoranthene
Beryllium (total)
Beta – BHC
Bicarbonate
Bis (2-Chloro-1-Methylethyl) Ether
Bis (2-Chloroethoxy) Methane
Bis (2-Chloroethyl) Ether
Bis (2-Ethylhexyl) Ether
Bis (2-Ethylhexyl) Phthalate
Bis(Chloromethyl) Ether
Boron
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform
Bromomethane
Butanol
Butyl Benzyl Phthalate
Calcium mg/l
Carbofuran
Carbon Disulfide
Carbon Tetrachloride
Chemical Oxygen Demand (COD)
Chlordane
Chloride mg/l
Chlorobenzene
Chloroethane
Chloroform
Chloromethane
Chromium (hexavalent)

Chromium (total)
Chrysene
Cis-1,2-Dichloroethylene
Cobalt (total)
Copper (total)
Cyanide
DDT
Delta – BHC
Di-N-Butyl Phthalate
Di-N-Octyl Phthalate
Dibenzo (a,h) Anthracene
Dibromochloromethane
Dibromomethane
Dichlorodifluoromethane
Dieldrin
Diethyl Phthalate
Dimethyl Phthalate
Endosulfan I
Endosulfan II
Endosulfan Sulfate
Endrin
Endrin Aldehyde
Ethyl Acetate
Ethylbenzene
Ethylene Dibromide (EDB)
Fluoranthene
Fluorene
Fluoride
Heptachlor Epoxide
Heptachlor
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene

Hexachloroethane
Ideno (1,2,3-cd) Pyrene
Iodomethane
Isopropylbenzene
Lead (total)
Lindane
Magnesium (total)
Manganese (total)
Mercury (total)
Methoxychlor
Methyl Chloride
Methyl Ethyl Ketone
Methylene Bromide
Methylene Chloride
Naphthalene
Nickel (total)
Nitrate-Nitrogen
Nitrobenzine
Oil. Hexane Soluble (or Equivalent)
Parathion
Pentachlorophenol
Phenanthrene
Phenols
Phosphorous
Polychlorinated Biphenyls
Potassium
Pyrene
Selenium
Silver (total)
Specific Conductance
Sodium
Styrene
Sulfate

Temperature of Leachate Sample (°F)
tert-Butylbenzene
Tetrachlorodibenzo-p-Dioxins
Tetrachloroethylene
Tetrahydrofuran
Thallium
Tin
Toluene
Total Organic Carbon (TOC)
Total Dissolved Solids (TDS) mg/l
Total Suspended Solids (TSS) mg/l
Toxaphene
trans-1,2-Dichloroethylene
trans-1,3-Dichlorpropene
Trichloroethylene
Trichlorofluoromethane
Vinyl Acetate
Vinyl Chloride
Xylene
Zinc (total)
m-Dichlorobenzene
m-Xylene
n-Butylbenzene
n-Nitrosodimethylamine
n-Nitrosodiphenylamine
n-Nitrosodipropylamine
n-Propylbenzene
o-Chlorotoluene
o-Dichlorobenzene
o-Nitrophenol
o-Xylene
p-Chlorotoluene
p-Cresol

p-Dichlorobenzene
p-Isopropyltoluene
p-Nitrophenol
p-Xylene
sec-Butylbenzene

Note: All parameters shall be determined from unfiltered samples.

(Source: Added at 31 Ill. Reg. _____, effective _____)

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE G: WASTE DISPOSAL
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER i: SOLID WASTE AND SPECIAL WASTE HAULING

PART 811
STANDARDS FOR NEW SOLID WASTE LANDFILLS

SUBPART A: GENERAL STANDARDS FOR ALL LANDFILLS

Section
811.101 Scope and Applicability
811.102 Location Standards
811.103 Surface Water Drainage
811.104 Survey Controls
811.105 Compaction
811.106 Daily Cover
811.107 Operating Standards
811.108 Salvaging
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AUTHORITY: Implementing Sections 7.2, 21, 21.1, 22, 22.17, and 22.40 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/7.2, 21, 21.1, 22, 22.17, 22.40, and 27].

SOURCE: Adopted in R88-7 at 14 Ill. Reg. 15861, effective September 18, 1990; amended in R92-19 at 17 Ill. Reg. 12413, effective July 19, 1993; amended in R93-10 at 18 Ill. Reg. 1308, effective January 13, 1994; expedited correction at 18 Ill. Reg. 7504, effective July 19, 1993; amended in R90-26 at 18 Ill. Reg. 12481, effective August 1, 1994; amended in R95-13 at 19 Ill. Reg. 12257, effective August 15, 1995; amended in R96-1 at 20 Ill. Reg. 12000, effective August 15, 1996; amended in R97-20 at 21 Ill. Reg. 15831, effective November 25, 1997; amended in R98-9 at 22 Ill. Reg. 11491, effective June 23, 1998; amended in R99-1 at 23 Ill. Reg. 2794, effective February 17, 1999; amended in R98-29 at 23 Ill. Reg. 6880, effective July 1, 1999; amended in R04-5/R04-15 at 28 Ill. Reg. 9107, effective June 18, 2004; amended in R05-1 at 29 Ill. Reg. 5044, effective March 22, 2005; amended in R06-5/R06-6/R06-7 at 30 Ill. Reg. 4136, effective February 23, 2006; amended in R06-16/R06-17/R06-18 at 31 Ill. Reg. 1435, effective December 20, 2006; amended in R07-8 at 31 Ill. Reg. _____ ~~_____~~, effective _____ ~~_____~~.

SUBPART C: PUTRESCIBLE AND CHEMICAL WASTE LANDFILLS

Section 811.309 Leachate Treatment and Disposal Systems

a) Leachate shall be allowed to flow freely from the drainage and collection system. The operator is responsible for the operation of a leachate management system designed to handle all leachate as it drains from the collection system. The leachate management system shall consist of any combination of storage, treatment, pretreatment, and disposal options designed and constructed in compliance with the requirements of this Section.

b) The leachate management system shall consist of any combination of multiple treatment and storage structures, to allow the management and disposal of leachate during routine maintenance and repairs.

c) Standards for Onsite Treatment and Pretreatment

1) All onsite treatment or pretreatment systems shall be considered part of the facility.

2) The onsite treatment or pretreatment system shall be designed in accordance with the expected characteristics of the leachate. The design may include modifications to the system necessary to accommodate changing leachate characteristics.

3) The onsite treatment or pretreatment system shall be designed to function for the entire design period.

4) All of the facility's unit operations, tanks, ponds, lagoons and basins shall be designed and constructed with liners or containment structures to control seepage to groundwater.

5) All treated effluent discharged to waters of the State shall meet the requirements of 35 Ill. Adm. Code 309.

6) The treatment system shall be operated by an operator certified under the requirements of 35 Ill. Adm. Code 312.

d) Standards for Leachate Storage Systems

1) Except as otherwise provided in subsection (d)(6) of this Section, the leachate storage facility must be able to store a minimum of at least five days' worth of accumulated leachate at the maximum generation rate used in designing the leachate drainage system in accordance with Section 811.307. The minimum storage capacity may be built up over time and in stages, so long as the capacity for five consecutive days of accumulated leachate is available at any time during the design period of the facility.

2) All leachate storage tanks shall be equipped with secondary containment systems equivalent to the protection provided by a clay liner 0.61 meter (2 feet thick) having a permeability no greater than 10-7 centimeters per second.

3) Leachate storage systems shall be fabricated from material compatible with the leachate expected to be generated and resistant to temperature extremes.

4) The leachate storage system shall not cause or contribute to a malodor.

5) The leachate drainage and collection system shall not be used for the purpose of storing leachate.

6) A facility may have less than five days' worth of storage capacity for accumulated leachate as required by subsection (d)(1) of this Section, if the owner or operator of the facility demonstrates that multiple treatment, storage and disposal options in the facility's approved leachate management system developed in accordance with subsection (b) of this Section will achieve equivalent performance. Such options shall consist of not less than one day's worth of storage capacity for accumulated leachate plus at least two alternative means of managing accumulated leachate through treatment or disposal, or both treatment and disposal, each of which means is capable of treating or disposing of all leachate generated at the maximum generation rate on a daily basis.

e) Standards for Discharge to an Offsite Treatment Works

1) Leachate may be discharged to an offsite treatment works that meets the following requirements:

A) All discharges of effluent from the treatment works shall meet the requirements of 35 Ill. Adm. Code 309.

B) The treatment systems shall be operated by an operator certified under the requirements of 35 Ill. Adm. Code 312.

C) No more than 50 percent of the average daily influent flow can be attributable to leachate from the solid waste disposal facility. Otherwise, the treatment works shall be considered a part of the solid waste disposal facility.

2) The operator is responsible for securing permission from the offsite treatment works for authority to discharge to the treatment works.

3) All discharges to a treatment works shall meet the requirements of 35 Ill. Adm. Code 310.

4) Pumps, meters, valves and monitoring stations that control and monitor the flow of leachate from the unit and which are under the control of the operator shall be considered part of the facility and shall be accessible to the operator at all times.

5) Leachate shall be allowed to flow into the sewage system at all times; however, if access to the treatment works is restricted or anticipated to be restricted for longer than five days, then an alternative leachate management system shall be constructed in accordance with subsection (c).

6) Where leachate is not directly discharged into a sewerage system, the operator shall provide storage capacity sufficient to transfer all leachate to an offsite treatment works. The storage system shall meet the requirements of subsection (d).

f) Standards for Leachate Recycling Systems

1) Leachate recycling systems may be utilized only at permitted waste disposal units that meet the following requirements:

A) The unit must have a liner designed, constructed and maintained to meet the minimum standards of Section 811.306.

B) The unit must have a leachate collection system in place and operating in accordance with Section 811.307.

C) A gas management system, equipped with a mechanical device such as a compressor to withdraw gas, must be implemented to control odors and prevent migration of methane in accordance with Section 811.311.

D) The topography must be such that any accidental leachate runoff can be controlled by ditches, berms or other equivalent control means.

2) Leachate shall not be recycled during precipitation events or in volumes large enough to cause runoff or surface seeps.

3) The amount of leachate added to the unit shall not exceed the ability of the waste and cover soils to transmit leachate flow downward. All other leachate shall be considered excess leachate, and a leachate management system capable of disposing of all excess leachate must be available.

4) The leachate storage and distribution system shall be designed to avoid exposure of leachate to air unless aeration or functionally equivalent devices are utilized.

5) The distribution system shall be designed to allow leachate to be evenly distributed beneath the surface over the recycle area.

6) Daily and intermediate cover shall be permeable to the extent necessary to prevent the accumulation of water and formation of perched watertables and gas buildup; alternatively cover shall be removed prior to additional waste placement.

7) Daily and intermediate cover shall slope away from the perimeter of the site to minimize surface discharges.

g) Leachate Monitoring

1) Representative samples of leachate shall be collected from each established leachate monitoring location ~~and tested~~ in accordance with subsection (g)(5) and tested for the parameters referenced in subsections (g)(2)(G) and (g)(3)(D) ~~at a frequency of once per quarter until such time as samples have been obtained and tested for at least eight quarters. If for any reason insufficient leachate is obtained to yield a sample for testing during a given quarterly monitoring attempt, such attempt shall not count toward the eight quarters' leachate monitoring requirement. Thereafter, the frequency of testing shall be changed to semi-annual for any monitored constituent while the leachate management system is in operation. However, the~~. The Agency may, by permit condition, require additional, or allow less, leachate sampling and testing as necessary to ensure compliance with this Section and Sections 811.312, 811.317, and 811.319.

2) Discharges of leachate from units that dispose of putrescible wastes shall be tested for the following constituents prior to treatment or pretreatment:

A) Five day biochemical oxygen demand (BOD5);

B) Chemical oxygen demand;

C) Total Suspended Solids;

D) Total Iron;

E) pH;

F) Any other constituents listed in the operator's National Pollution Discharge Elimination System (NPDES) discharge permit, pursuant to 35 Ill. Adm. Code 304, or required by a publicly owned treatment works, pursuant to 35 Ill. Adm. Code 310; and

G) All ~~of the indicator constituents chosen in accordance with Section 811.319(a)(2)(B) and used by the operator for groundwater monitoring~~ the monitoring parameters listed in Section 811.Appendix C, unless an alternate monitoring list has been approved by the Agency.

3) Discharges of leachate from units which dispose only chemical wastes shall be monitored for constituents determined by the characteristics of the chemical waste to be disposed of in the unit. They shall include, as a minimum:

A) pH;

B) Total Dissolved Solids;

C) Any other constituents listed in the operator's NPDES discharge permit, pursuant to 35 Ill. Adm. Code 304, or required by a publicly owned treatment works, pursuant to 35 Ill. Adm. Code 310; and

D) All ~~of the indicator constituents chosen in accordance with Section 811.319(a)(2)(B) and used by the operator for groundwater monitoring~~ the monitoring parameters listed in Section 811.Appendix C, unless an alternate monitoring list has been approved by the Agency.

4) A network of leachate monitoring locations shall be established, capable of characterizing the leachate produced by the unit. Unless an alternate network has been approved by the Agency, the network of leachate monitoring locations shall include:

A) At least four leachate monitoring locations; and

B) At least one leachate monitoring location for every 25 acres within the unit's waste boundaries.

5) Leachate monitoring shall be performed at least once every six months and each established leachate monitoring location shall be monitored at least once every two years.

h) Time of Operation of the Leachate Management System

1) The operator shall collect and dispose of leachate for a minimum of five years after closure and thereafter until treatment is no longer necessary.

2) Treatment is no longer necessary if the leachate constituents do not exceed the wastewater effluent standards in 35 Ill. Adm. Code 304.124, 304.125, 304.126 and do not contain a BOD~~[~~5~~]~~ concentration greater than 30 mg/L for six consecutive months.

3) Leachate collection at a MSWLF unit shall be continued for a minimum period of 30 years after closure, except as otherwise provided by subsections (h)(4) and (h)(5)~~, below.~~.

4) The Agency may reduce the leachate collection period at a MSWLF unit upon a demonstration by the owner or operator that the reduced period is sufficient to protect human health and environment.

5) The owner or operator of a MSWLF unit shall petition the Board for an adjusted standard in accordance with Section 811.303, if the owner or operator seeks a reduction of the postclosure care monitoring period for all of the following requirements:

i) Inspection and maintenance (Section 811.111);

ii) Leachate collection (Section 811.309);

iii) Gas monitoring (Section 811.130); and

iv) Groundwater monitoring (Section 811.319).

BOARD NOTE: Subsection (h) is derived from 40 CFR 258.61 (1992).

(Source: Amended at 31 Ill. Reg. _____, effective _____)

Section 811.315 Hydrogeologic Site Investigations

a) Purpose

The operator shall conduct a hydrogeologic investigation to develop hydrogeologic information for the following uses:

1) Provide information to perform a groundwater impact assessment; and

2) Provide information to establish a groundwater monitoring system.

b) General Requirements

1) The investigation shall be conducted in a minimum of three phases prior to submission of any application to the Agency for a permit to develop and operate a landfill facility.

2) The study area shall consist of the entire area occupied by the facility and any adjacent related areas, if necessary for the purposes of the hydrogeological investigation set forth in subsection (a).

3) All borings shall be sampled continuously at all recognizable points of geologic variation, except that where continuous sampling is impossible or where non-continuous sampling can provide equivalent information, samples shall be obtained at intervals no greater than 1.52 meters (five feet) in homogeneous strata.

c) Minimum Requirements ~~For~~for a Phase I Investigation

1) The operator shall conduct a Phase I Investigation to develop the following information:

A) Climatic aspects of the study area;

B) The regional and study area geologic setting, including a description of the geomorphology and stratigraphy of the area;

C) The regional groundwater regime including water table depths and aquifer characteristics; and

D) Information for the purpose of designing a Phase II Hydrogeologic Investigation.

2) Specific Requirements

A) The regional hydrogeologic setting of the unit shall be established by using material available from all possible sources, including, but not limited to, the Illinois Scientific Surveys, the Agency, other State and Federal organizations, water well drilling logs, and previous investigations.

B) A minimum of one continuously sampled boring shall be drilled on the site, as close as feasible to the geographic center, to determine if the available

regional hydrogeologic setting information is accurate and to characterize the site-specific hydrogeology to the extent specified by this phase of the investigation. The boring shall extend at least 15.2 meters (50 feet) below the bottom of the uppermost aquifer or through the full depth of the confining layer below the uppermost aquifer, or to bedrock, if the bedrock is below the upper most aquifer, whichever elevation is higher. The locations of any additional borings, required under this subsection, may be chosen by the investigator, but shall be sampled continuously.

d) Minimum Requirements ~~For A~~for a Phase II Investigation

1) Information to be developed

Using the information developed in the Phase I survey, a Phase II study shall be conducted to collect the site-specific information listed below as needed to augment data collected during the Phase I investigation and to prepare for the Phase III investigation:

A) Structural characteristics and distribution of underlying strata including bedrock;

B) Chemical and physical properties including, but not limited to, lithology, mineralogy, and hydraulic ~~characterisiticscharacteristics~~characteristics of underlying strata including those below the uppermost aquifer;

C) Soil characterisitics, including soil types, distribution, geochemical and geophysical characteristics;

D) The hydraulic conductivities of the uppermost aquifer and all strata above it;

E) The vertical extent of the uppermost aquifer;

F) The direction and rate of groundwater flow.

2) Specific Requirements

A) One boring shall be located as close as feasible to the topographical high point, and another shall be located as close as feasible to the topographical low point of the study area.

B) At least one boring shall be at or near each corner of the site. Where the property is irregularly shaped the borings shall be located near the boundary in a pattern and spacing necessary to obtain data over the entire study area.

C) Additional borings may be located at intermediate points at locations and spacings necessary to establish the continuity of the stratigraphic units.

D) Piezometers and groundwater monitoring wells shall be established to determine the direction and flow characteristics of the groundwater in all strata and extending down to the bottom of the uppermost aquifer. Groundwater samples taken from such monitoring wells shall be used to develop preliminary information needed for establishing background concentrations in accordance with subsection (e)(1)(G).

E) Other methods may be utilized to confirm or accumulate additional information. Such methods may be used only as a supplement to, not in lieu of,

site-specific boring information. Other methods include, but are not limited to, geophysical well logs, geophysical surveys, aerial photography, age dating, and test pits.

e) Minimum Standards For A Phase III Investigation

1) Using the information developed during the Phase I and Phase II Investigations, the operator shall conduct a Phase III Investigation. This investigation shall be conducted to collect or augment the site-specific information needed to carry out the following:

A) Verification and ~~reconcilationreconciliation~~reconciliation of the information collected in the Phase I and II investigations;

B) Characterization of potential pathways for contaminant migration;

C) Correlation of stratigraphic units between borings;

D) Continuity of petrographic features including, but not limited to, sorting, grain size distribution, cementation and hydraulic conductivity;

E) Identification of zones of potentially high hydraulic conductivity;

F) Identification of the confining layer, if present;

G) Concentrations of chemical constituents present in the groundwater below the unit, down to the bottom of the uppermost aquifer, using a broad range of chemical analysis and detection procedures such as, gas chromatographic and mass spectrometric scanning. However, additional measurements and procedures shall be carried out to establish background concentrations, in accordance with Section 811.320(d), for:

i) Any constituent for which there is a ~~public or food processing water supply~~ standard at 35 Ill. Adm. Code ~~302620~~620 established by the Board and which is expected to appear in the leachate; and

ii) Any other constituent for which there is no Board-established standard, but which is expected to appear in the leachate at concentrations above PQL, as defined in Section 811.319(a)(4)(A) for that constituent;

H) Characterization of the seasonal and temporal, naturally and ~~artificallyartificially~~artificially induced, variations in groundwater quality and groundwater flow; and

I) Identification of unusual or unpredicted geologic features, including: fault zones, fracture traces, facies changes, solution channels, buried stream deposits, cross cutting structures and other geologic features that may affect the ability of the operator to monitor the groundwater or predict the impact of the disposal facility on groundwater.

2) In addition to the specific requirements applicable to ~~phase~~Phase I and II investigations, the operator shall collect information needed to meet the minimum standards of a ~~phase~~Phase III investigation by using methods that may include, but not limited to excavation of test pits, additional borings located at intermediate points between boreholes placed during ~~phase~~Phase I and II investigations, placement of piezometers and monitoring wells, and institution of procedures for sampling and analysis.

f) The operator may conduct the hydrogeologic investigation in any number of alternative ways provided that the necessary information is collected in a systematic sequence consisting of at least three phases that is equal to or superior to the investigation procedures of this Section.

(Source: Amended at 31 Ill. Reg. _____, effective _____)

Section 811.318 Design, Construction, and Operation of Groundwater Monitoring Systems

a) All potential sources of discharges to groundwater within the facility, including, but not limited to, all waste disposal units and the leachate management system, shall be identified and studied through a network of monitoring wells operated during the active life of the unit and for the time after closure specified in accordance with Section 811.319. Monitoring wells designed and constructed as part of the monitoring network shall be maintained along with records that include, but are not limited to, exact well location, well size, type of well, the design and construction practice used in its installation and well and screen depths.

b) Standards for the Location of Monitoring Points

1) A network of monitoring points shall be established at sufficient locations downgradient with respect to groundwater flow and not excluding the downward direction, to detect any discharge of contaminants from any part of a potential source of discharge.

2) Monitoring wells shall be located in stratigraphic horizons that could serve as contaminant migration pathways.

3) Monitoring wells shall be established as close to the potential source of discharge as possible without interfering with the waste disposal operations, and within half the distance from the edge of the potential source of discharge to the edge of the zone of attenuation downgradient, with respect to groundwater flow, from the source.

4) The network of monitoring points of several potential sources of discharge within a single facility may be combined into a single monitoring network, provided that discharges from any part of all potential sources can be detected.

5) A minimum of at least one monitoring well shall be established at the edge of the zone of attenuation and shall be located downgradient with respect to groundwater flow and not excluding the downward direction, from the unit. Such well or wells shall be used to monitor any statistically significant increase in the concentration of any constituent, in accordance with Section 811.320(e) and shall be used for determining compliance with an applicable groundwater quality standard of Section 811.320. An observed statistically significant increase above the applicable groundwater quality standards of Section 811.320 in a well located at or beyond the compliance boundary shall constitute a violation.

c) Maximum Allowable Predicted Concentrations

The operator shall use the same calculation methods, data, and assumptions as used in the groundwater impact assessment to predict the concentration over time and space of all constituents chosen to be monitored in accordance with Section 811.319 at all monitoring points. The predicted values shall be used to establish the maximum allowable predicted concentrations (MAPC) at each

monitoring point. The MAPCs calculated in this subsection shall be applicable within the zone of attenuation.

d) Standards for Monitoring Well Design and Construction

1) All monitoring wells shall be cased in a manner that maintains the integrity of the bore hole. The casing material shall be inert so as not to affect the water sample. Casing requiring solvent-cement type couplings shall not be used.

2) Wells shall be screened to allow sampling only at the desired interval. Annular space between the borehole wall and well screen section shall be packed with gravel sized to avoid clogging by the material in the zone being monitored. The slot size of the screen shall be designed to minimize clogging. Screens shall be fabricated from material expected to be inert with respect to the constituents of the groundwater to be sampled.

3) Annular space above the well screen section shall be sealed with a relatively impermeable, expandable material such as a cement/bentonite grout, which does not react with or in any way affect the sample, in order to prevent contamination of samples and groundwater and avoid interconnections. The seal shall extend to the highest known seasonal groundwater level.

4) The annular space shall be back-filled with expanding cement grout from an elevation below the frost line and mounded above the surface and sloped away from the casing so as to divert surface water away.

5) The annular space between the upper and lower seals and in the unsaturated zone may be back-filled with uncontaminated cuttings.

6) All wells shall be covered with vented caps and equipped with devices to protect against tampering and damage.

7) All wells shall be developed to allow free entry of water, minimize turbidity of the sample, and minimize clogging.

8) The transmissivity of the zone surrounding all well screens shall be established by field testing techniques.

9) Other sampling methods and well construction techniques may be utilized if they provide equal or superior performance to the requirements of this subsection.

e) Standards for Sample Collection and Analysis

1) The groundwater monitoring program shall include consistent sampling and analysis procedures to assure that monitoring results can be relied upon to provide data representative of groundwater quality in the zone being monitored.

2) The operator shall utilize procedures and techniques to insure that collected samples are representative of the zone being monitored and that prevent cross contamination of samples from other monitoring wells or from other samples. At least 95 percent of a collected sample shall consist of groundwater from the zone being monitored.

3) The operator shall establish a quality assurance program that provides quantitative detection limits and the degree of error for analysis of each chemical constituent.

4) The operator shall establish a sample preservation and shipment procedure that maintains the reliability of the sample collected for analysis.

5) The operator shall institute a chain of custody procedure to prevent tampering and contamination of the collected samples prior to completion of analysis.

6) At a minimum, the operator shall sample the following parameters at all wells at the time of sample collection and immediately before filtering and preserving samples for shipment:

A) The elevation of the water table;

B) ~~The depth of the well below ground;CB)~~ pH;

~~DC~~C) The temperature of the sample; and

~~ED~~D) Specific Conductance.

7) The operator must measure the depth of the well below ground on an annual basis, at wells that do not contain dedicated pumps. The operator must measure the depth of the well below ground every 5 years, or whenever the pump is pulled, in wells with dedicated pumps.

~~78~~8) In addition to the requirements of subsections (e)(1) through (e)(6), the following requirements shall apply to MSWLF units:

A) Each time groundwater is sampled, an owner or operator of a MSWLF unit shall:

i) Measure the groundwater elevations in each well immediately prior to purging; and

ii) Determine the rate and direction of ground-water flow.

B) An owner or operator shall measure groundwater elevations in wells which monitor the same waste management area within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater flow rate and direction.

BOARD NOTE: Subsection (e)(7) is derived from 40 CFR 258.53(d) (1992).

(Source: Amended at 31 Ill. Reg. _____, effective _____)

Section 811.319 Groundwater Monitoring Programs

a) Detection Monitoring Program

Any use of the term maximum allowable predicted concentration in this Section is a reference to Section 811.318(c). The operator shall implement a detection monitoring program in accordance with the following requirements:

1) Monitoring Schedule and Frequency

A) The monitoring period shall begin as soon as waste is placed into the unit of a new landfill or within one year of the effective date of this Part for an existing landfill. Monitoring shall continue for a minimum period of fifteen years after closure, or in the case of MSWLF units, a minimum period of 30 years after closure, except as otherwise provided by subsection (a)(1)(C) of this Section. The operator shall sample all monitoring points for all potential sources of contamination on a quarterly basis except as specified in subsection (a)(3), for a period of five years from the date of issuance of the initial permit for significant modification under 35 Ill. Adm. Code 814.104 or a permit for a new unit pursuant to 35 Ill. Adm. Code 813.104. After the initial five-year period, the sampling frequency for each monitoring point shall be reduced to a semi-annual basis, provided the operator has submitted the certification described in 35 Ill. Adm. Code 813.304(b). Alternatively, after the initial five-year period, the Agency shall allow sampling on a semi-annual basis where the operator demonstrates that monitoring effectiveness has not been compromised, that sufficient quarterly data has been collected to characterize groundwater, and that leachate from the monitored unit does not constitute a threat to groundwater. For the purposes of this Section, the source shall be considered a threat to groundwater if the results of the monitoring indicate either that the concentrations of any of the constituents monitored within the zone of attenuation is above the maximum allowable predicted concentration for that constituent or, for existing landfills, subject to 35 Ill. Adm. Code 814, Subpart D, that the concentration of any constituent has exceeded the applicable standard at the compliance boundary as defined in 35 Ill. Adm. Code 814.402(b)(3).

B) Beginning fifteen years after closure of the unit, or five years after all other potential sources of discharge no longer constitute a threat to groundwater, as defined in subsection (a)(1)(A), the monitoring frequency may change on a well by well basis to an annual schedule if either of the following conditions exist. However, monitoring shall return to a quarterly schedule at any well where a statistically significant increase is determined to have occurred in accordance with Section 811.320(e), in the concentration of any constituent with respect to the previous sample.

i) All constituents monitored within the zone of attenuation have returned to a concentration less than or equal to ten percent of the maximum allowable predicted concentration; or

ii) All constituents monitored within the zone of attenuation are less than or equal to their maximum allowable predicted concentration for eight consecutive quarters.

C) Monitoring shall be continued for a minimum period of: ~~thirty~~ 30 years after closure at MSWLF units, except as otherwise provided by subsections (a)(1)(D) and (a)(1)(E)~~, below~~; five years after closure at landfills, other than MSWLF units, which are used exclusively for disposing waste generated at the site; or ~~fifteen~~15 years after closure at all other landfills regulated under this Part. Monitoring, beyond the minimum period, may be discontinued under the following conditions:

i) No statistically significant increase is detected in the concentration of any constituent above that measured and recorded during the immediately preceding scheduled sampling for three consecutive years, after changing to an annual monitoring frequency; or

ii) Immediately after contaminated leachate is no longer generated by the unit.

D) The Agency may reduce the groundwater monitoring period at a MSWLF unit upon a demonstration by the owner or operator that the reduced period is sufficient to protect human health and environment.

E) An owner or operator of a MSWLF unit shall petition the Board for an adjusted standard in accordance with Section 811.303, if the owner or operator seeks a reduction of the postclosure care monitoring period for all of the following requirements:

i) Inspection and maintenance (Section 811.111);

ii) Leachate collection (Section 811.309);

iii) Gas monitoring (Section 811.310); and

iv) Groundwater monitoring (Section 811.319).

BOARD NOTE: Changes to subsections (a)(1)(A) and (a)(1)(C), and subsections (a)(1)(D) and (a)(1)(E) are derived from 40 CFR 258.61 (1992).

2) Criteria for Choosing Constituents to be Monitored

A) The operator shall monitor each well for constituents that will provide a means for detecting groundwater contamination. Constituents shall be chosen for monitoring if they meet the following requirements:

i) The constituent appears in, or is expected to be in, the leachate; and

ii) Is contained within the following list of constituents~~.~~:

Ammonia - Nitrogen (dissolved)
Arsenic (dissolved)
Boron (dissolved)
Cadmium (dissolved)
Chloride (dissolved)
Chromium (dissolved)
Cyanide (total)
Lead (dissolved)
Magnesium (dissolved)
Mercury (dissolved)
Nitrate (dissolved)
Sulfate (dissolved)
Total Dissolved Solids (TDS)
Zinc (dissolved)

~~ii) The Board has established for the constituent a public or food processing water supply standard, at 35 Ill. Adm. Code 302, the Board has established a groundwater quality standard under the Illinois Groundwater Protection Act [415 ILCS 55], or the constituent may otherwise cause or contribute to groundwater contamination.~~

iii) This is the minimum list for MSWLFs.

iv) Any facility accepting more than 50% by volume non-municipal must determine additional indicator parameters based upon leachate characteristic and waste content.

B) One or more indicator constituents, representative of the transport processes of constituents in the leachate, may be chosen for monitoring in place of the constituents it represents. The use of such indicator constituents must be included in an Agency approved permit.

3) Organic Chemicals Monitoring

The operator shall monitor each existing well that is being used as a part of the monitoring well network at the facility within one year of the effective date of this Part, and monitor each new well within the three months of its establishment. The monitoring required by this subsection (a)(3) shall be for a broad range of organic chemical contaminants in accordance with the procedures described below:

A) The analysis shall be at least as comprehensive and sensitive as the tests for~~;i)~~ ~~The~~ the 51 organic chemicals in drinking water described at 40 CFR 141.40 (1988) and 40 CFR 258.Appendix I (2006), incorporated by reference at 35 Ill. Adm. Code 810.104~~;~~ and:

~~ii) Any other organic chemical for which a groundwater quality standard or criterion has been adopted pursuant to Section 14.4 of the Act or Section 8 of the Illinois Groundwater Protection Act.~~
~~Acetone~~
~~Acrylonitrile~~
~~Benzene~~
~~Bromobenzene~~
~~Bromochloromethane~~
~~Bromodichloromethane~~
~~Bromoform; Tribromomethane~~
~~n-Butylbenzene~~
~~sec-Butylbenzene~~
~~tert-Butylbenzene~~
~~Carbon disulfide~~
~~Carbon tetrachloride~~
~~Chlorobenzene~~
~~Chloroethane~~
~~Chloroform; Trichloromethane~~
~~o-Chlorotoluene~~
~~p-Chlorotoluene~~
~~Dibromochloromethane~~
AcetoneAcrylonitrileBenzeneBromobenzeneBromochloromethaneBromodichloromethaneBromoform; Tribromomethanen-Butylbenzenesec-Butylbenzenetert-Butylbenzene Carbon disulfideCarbon tetrachlorideChlorobenzeneChloroethaneChloroform; Trichloromethaneo-Chlorotoluenep-ChlorotolueneDibromochloromethane1,2-Dibromo-3-chloropropane1,2-Dibromoethane1,2-Dichlorobenzene1,3-Dichlorobenzene1,4-~~Dichlorobenzenetrans~~Dichlorobenzenetrans-1,4-Dichloro-2-~~butene~~
~~Dichlorodifluoromethane~~buteneDichlorodifluoromethane1,1-Dichloroethane1,2-Dichloroethane1,1-~~Dichloroethylene~~
~~cis-1,2-Dichloroethylenetrans~~Dichloroethylenecis-1,2-Dichloroethylenetrans-1,2-Dicloroethylene1,2-Dichloropropane1,3-Dichloropropane2,2-Dichloropropane1,1-Dichloropropene1,3-~~Dichloropropene~~
~~cis-1,3-Dichloropropene~~

~~trans-1,3-Dichloropropene~~
~~Ethylbenzene~~
~~Hexachlorobutadiene~~Dichloropropenecis-1,3-Dichloropropenetrans-1,3-DichloropropeneEthylbenzeneHexachlorobutadiene2-Hexanone; Methyl butyl ~~ketone~~
~~Isopropylbenzene~~
~~p-Isopropyltoluene~~~~Methyl bromide; Bromomethane~~~~Methyl chloride; Chloromethane~~
~~Methylene bromide; Dibromomethane~~
~~Dichloromethane~~
~~Methyl ethyl ketone~~~~Methyl~~ketoneIsopropylbenzenep-IsopropyltolueneMethyl bromide; BromomethaneMethyl chloride; ChloromethaneMethylene bromide; DibromomethaneDichloromethaneMethyl ethyl ketoneMethyl iodide; Iodomethane4-Methyl-2-~~pentanone~~
~~Naphthalene~~~~Oil~~pentanoneNaphthaleneOil and Grease (hexane soluble)n-~~Propylbenzene~~
~~Styrene~~PropylbenzeneStyrene1,1,1,2-Tetrachloroethane1,1,2,2-~~Tetrachloroethane~~
~~Tetrachloroethylene~~
~~Tetrahydrofuran~~
~~Toluene~~~~Total~~TetrachloroethaneTetrachloroethyleneTetrahydrofuranTolueneTotal Phenolics1,2,3-Trichlorobenzene1,2,4-~~Trichlorbenzene~~Trichlorobenzene1,1,1-Trichloroethane1,1,2-~~Trichloroethane~~
~~Trichloroethylene~~
~~Trichlorofluoromethane~~TrichloroethaneTrichloroethyleneTrichlorofluoromethane1,2,3-Trichloropropane1,2,4-Trimethylbenzene1,3,5-TrimethylbenzeneVinyl acetateVinyl chlorideXylenes
~~1,3,5-Trimethylbenzene~~
~~Vinyl acetate~~
~~Vinyl chloride~~
~~Xylenes~~

B) At least once every two years, the operator shall monitor each well in accordance with subsection (a)(~~13~~3)(A).

C) The operator of a MSWLF unit shall monitor each well in accordance with subsection (a)(~~1~~3)(A) on ~~an~~ a semi-annual basis.

BOARD NOTE: Subsection (a)(3)(C) is derived from 40 CFR 258.54(b) (1992).

4) Confirmation of Monitored Increase

A) The confirmation procedures of this subsection shall be used only if the concentrations of the constituents monitored can be measured at or above the practical quantitation limit (PQL). The PQL is defined as the lowest concentration that can be reliably measured within specified limits of precision and accuracy, under routine laboratory operating conditions. The operator shall institute the confirmation procedures of subsection (a)(4)(B) after notifying the Agency in writing, within ten days, of observed increases:

i) The concentration of any inorganic constituent monitored in accordance with ~~subsection~~subsections (a)(1) and (a)(2) shows a progressive increase over ~~foureight~~eight consecutive monitoring events;

ii) The concentration of any constituent exceeds the maximum allowable predicted concentration at an established monitoring point within the zone of attenuation;

iii) The concentration of any constituent monitored in accordance with subsection (a)(3) exceeds the preceding measured concentration at any established monitoring point; and

iv) The concentration of any constituent monitored at or beyond the zone of attenuation exceeds the applicable groundwater quality standards of Section 811.320.

B) The confirmation procedures shall include the following:

i) The operator shall verify any observed increase by taking additional samples within ~~4590~~90 days ~~of~~after the initial ~~observationsampling~~sampling event and ensure that the samples and sampling protocol used will detect any statistically significant increase in the concentration of the suspect constituent in accordance with Section 811.320(e), so as to confirm the observed increase. The operator shall notify the Agency of any confirmed increase before the end of the next business day following the confirmation.

ii) The operator shall determine the source of any confirmed increase, which may include, but shall not be limited to, natural phenomena, sampling or analysis errors, or an offsite source.

iii) The operator shall notify the Agency in writing of any confirmed increase~~and~~. The notification must demonstrate a source other than the facility ~~state the source of the confirmed increase~~ and provide the rationale used in such a~~determination within ten days of the~~ determination. The notification must be submitted to the Agency no later than 180 days after the original sampling event. If the facility is permitted by the Agency, the notification must be filed for review as a significant permit modification pursuant to 35 Ill. Adm. Code 813.Subpart B.

iv) If an alternative source demonstration described in subsections (a)(4)(B)(ii) and (iii) of this Section cannot be made, assessment monitoring is required in accordance with subsection (b) of this Section.

v) If an alternative source demonstration, submitted to the Agency as an application, is denied pursuant to 35 Ill. Adm. Code 813.105, the operator must commence sampling for the constituents listed in subsection (b)(5) of this Section, and submit an assessment monitoring plan as a significant permit modification, both within 30 days after the dated notification of Agency denial. The operator must sample the well or wells that exhibited the confirmed increase.

b) Assessment Monitoring

The operator shall begin an assessment monitoring program in order to confirm that the solid waste disposal facility is the source of the contamination and to provide information needed to carry out a groundwater impact assessment in accordance with subsection (c). The assessment monitoring program shall be conducted in accordance with the following requirements:

1) The assessment monitoring shall be conducted in accordance with this subsection to collect information to assess the nature and extent of groundwater contamination. The owner or operator of a MSWLF unit shall comply with the additional requirements prescribed in subsection (b)(5). The assessment monitoring shall consist of monitoring of additional constituents that might indicate the source and extent of contamination. In addition, assessment monitoring may include any other investigative techniques that will assist in

determining the source, nature and extent of the contamination, which may consist of, but need not be limited to:

A) More frequent sampling of the wells in which the observation occurred;

B) More frequent sampling of any surrounding wells; and

C) The placement of additional monitoring wells to determine the source and extent of the contamination.

2) ~~The~~Except as provided for in subsections (a)(4)(B)(iii) and (v) of this Section, the operator of the facility for which assessment monitoring is required shall file the plans for an assessment monitoring program with the Agency. If the facility is permitted by the Agency, then the plans shall be filed for review as a significant permit modification pursuant to 35 Ill. Adm. Code 813.Subpart B within 180 days ~~of~~after the original sampling event. The assessment monitoring program shall be implemented within ~~90~~180 ~~days of confirmation of any monitored increase the~~180 days after the original sampling event in accordance with subsection (a)(4) or, in the case of permitted facilities, within ~~90~~45 days ~~of~~after Agency approval.

3) If the analysis of the assessment monitoring data shows that the concentration of one or more constituents, monitored at or beyond the zone of attenuation is above the applicable groundwater quality standards of Section 811.320 and is attributable to the solid waste disposal facility, then the operator shall determine the nature and extent of the groundwater contamination including an assessment of the potential impact on the groundwater should waste continue to be accepted at the facility and shall implement the remedial action in accordance with subsection (d).

4) If the analysis of the assessment monitoring data shows that the concentration of one or more constituents is attributable to the solid waste disposal facility and exceeds the maximum allowable predicted concentration within the zone of attenuation, then the operator shall conduct a groundwater impact assessment in accordance with the requirements of subsection (c).

5) In addition to the requirements of subsection (b)(1), to collect information to assess the nature and extent of groundwater contamination, the following requirements are applicable to MSWLF units:

A) The monitoring of additional constituents pursuant to subsection (b)(~~1~~)(~~A~~1) ~~shall~~must ~~must~~ include, at a minimum (except as otherwise provided in subsection (b)(5)(E) of this Section), the constituents listed in 40 CFR 258.Appendix II, incorporated by reference at 35 Ill. Adm. Code ~~810.104.~~810.104 and constituents from 35 Ill. Adm. Code 620.410.

BOARD NOTE: Subsection (b)(5)(A) is derived from 40 CFR 258.55(b) (1992).

B) Within 14 days ~~of~~after obtaining the results of sampling required under subsection (b)(5)(A), the owner or operator shall:

i) Place a notice in the operating record identifying the constituents that have been detected; and

ii) Notify the Agency that such a notice has been placed in the operating record.

BOARD NOTE: Subsection (b)(5)(B) is derived from 40 CFR 258.55(d)(~~1~~1) (1992).

C) The owner or operator shall establish background concentrations for any constituents detected pursuant to subsection (b)(5)(A) in accordance with Section 811.320(e).

BOARD NOTE: Subsection (b)(5)(C) is derived from 40 CFR 258.55(d)(3) (1992).

D) Within 90 days ~~of~~after the initial monitoring in accordance with subsection (b)(5)(A), the owner or operator ~~shallmust~~must monitor for the detected constituents listed in 40 CFR 258.Appendix II and 35 Ill. Adm. Code 620.410 on a semiannual basis during the assessment monitoring. The operator must monitor all the constituents listed in 40 CFR 258.Appendix II and 35 Ill. Adm. Code 620.410 on an annual basis during assessment monitoring.

BOARD NOTE: Subsection (b)(5)(D) is derived from 40 CFR 258.55(d)(2) (1992).

E) The owner or operator may request the Agency to delete any of the 40 CFR 258.Appendix II and 35 Ill. Adm. Code 620.410 constituents by demonstrating to the Agency that the deleted constituents are not reasonably expected to be in or derived from the waste contained in the leachate.

BOARD NOTE: Subsection (b)(5)(E) is derived from 40 CFR 258.55(b) (1992).

F) Within 14 days ~~of~~after finding an exceedance above the applicable groundwater quality standards in accordance with subsection (b)(3), the owner or operator shall:

i) Place a notice in the operating record that identifies the constituents monitored under subsection (b)(~~1~~1)(D) that have exceeded the groundwater quality standard;

ii) Notify the Agency and the appropriate officials of the local municipality or county within whose boundaries the site is located that such a notice has been placed in the operating record; and

iii) Notify all persons who own land or reside on land that directly overlies any part of the plume of contamination if contaminants have migrated off-site.

BOARD NOTE: Subsection (b)(5)(F) is derived from 40 CFR 258.55(g)(~~1~~1)(i) through (iii) (1992).

G) If the concentrations of all 40 CFR 258.Appendix II and 35 Ill. Adm. Code 620.410 constituents are shown to be at or below background values, using the statistical procedures in Section 811.320(e), for two consecutive sampling events, the owner or operator shall notify the Agency of this finding and may stop monitoring the 40 CFR 258.Appendix II and 35 Ill. Adm. Code 620.410 constituents.

BOARD NOTE: Subsection (b)(5)(G) is derived from 40 CFR 258.55(e) (1992).

c) Assessment of Potential Groundwater Impact. An operator required to conduct a groundwater impact assessment in accordance with subsection (b)(4) shall assess the potential impacts outside the zone of attenuation that may result from confirmed increases above the maximum allowable predicted concentration within the zone of attenuation, attributable to the facility, in

order to determine if there is need for remedial action. In addition to the requirements of Section 811.317, the following shall apply:

1) The operator shall utilize any new information developed since the initial assessment and information from the detection and assessment monitoring programs and such information may be used for the recalibration of the GCT model; and

2) The operator shall submit the groundwater impact assessment and any proposed remedial action plans determined necessary pursuant to subsection (d) to the Agency within 180 days ~~of~~after the start of the assessment monitoring program.

d) Remedial Action. The owner or operator of a MSWLF unit shall conduct corrective action in accordance with Sections 811.324, 811.325, and 811.326. The owner or operator of a landfill facility, other than a MSWLF unit, shall conduct remedial action in accordance with this subsection.

1) The operator shall submit plans for the remedial action to the Agency. Such plans and all supporting information including data collected during the assessment monitoring shall be submitted within 90 days ~~of~~after determination of either of the following:

A) ~~theThe~~The groundwater impact assessment, performed in accordance with subsection (c), indicates that remedial action is needed; or

B) Any confirmed increase above the applicable groundwater quality standards of Section 811.320 is determined to be attributable to the solid waste disposal facility in accordance with subsection (b).

2) If the facility has been issued a permit by the Agency, then the operator shall submit this information as an application for significant modification to the permit;

3) The operator shall implement the plan for remedial action program within 90 days ~~of~~after the following:

A) Completion of the groundwater impact assessment that requires remedial action;

B) Establishing that a violation of an applicable groundwater quality standard of Section 811.320 is attributable to the solid waste disposal facility in accordance with subsection (b)(3); or

C) Agency approval of the remedial action plan, where the facility has been permitted by the Agency.

4) The remedial action program shall consist of one or a combination of one of more of the following solutions:

A) Retrofit additional groundwater protective measures within the unit;

B) Construct an additional hydraulic barrier, such as a cutoff wall or slurry wall system

C) Pump and treat the contaminated groundwater; or

D) Any other equivalent technique which will prevent further contamination of groundwater.

5) Termination of the Remedial Action Program

A) The remedial action program shall continue in accordance with the plan until monitoring shows that the concentrations of all monitored constituents are below the maximum allowable predicted concentration within the zone of attenuation, below the applicable groundwater quality standards of Section 811.320 at or beyond the zone of attenuation, over a period of four consecutive quarters no longer exist.

B) The operator shall submit to the Agency all information collected under subsection (d)(5)(A). If the facility is permitted then the operator shall submit this information as a significant modification of the permit.

(Source: Amended at 31 Ill. Reg. _____, effective _____)

Section 811.320 Groundwater Quality Standards

a) Applicable Groundwater Quality Standards

1) Groundwater quality shall be maintained at each constituent's background concentration, at or beyond the zone of attenuation. The applicable groundwater quality standard established for any constituent shall be:

A) The background concentration; or

B) The Board established standard adjusted by the Board in accordance with the justification procedure of subsection (b).

2) Any statistically significant increase above an applicable groundwater quality standard established pursuant to subsection (a) that is attributable to the facility and which occurs at or beyond the zone of attenuation within 100 years after closure of the last unit accepting waste within such a facility shall constitute a violation.

3) For the purposes of this Part:

A) "Background concentration" means that concentration of a constituent that is established as the background in accordance with subsection (d); and

B) "Board established standard" is the concentration of a constituent adopted by the Board as a ~~standard for public and food processing water supplies under 35 Ill. Adm. Code 302 or as a~~ groundwater quality standard adopted by the Board pursuant to Section 14.4 of the Act or Section 8 of the Illinois Groundwater Protection Act~~, whichever is lower~~.

b) Justification for Adjusted Groundwater Quality Standards

1) An operator may petition the Board for an adjusted groundwater quality standard in accordance with the procedures specified in Section 28.1 of the Act and 35 Ill. Adm. Code ~~106.410 through 106.416~~104.400.104.400, Subpart D.

2) For groundwater which contains naturally occurring constituents which meet the applicable requirements of 35 Ill. Adm. Code ~~302.301, 302.304, and 302.305,620.410,~~620.410, 620.420, 620.430, or ~~620.440~~620.440, the Board will

specify adjusted groundwater quality standards no greater than those of 35 Ill. Adm. Code ~~302.301, 302.304, and 302.305,620.410,~~620.410, 620.420, ~~620.430~~620.430, or 620.440, respectively, upon a demonstration by the operator that:

A) The change in standards will not interfere with, or become injurious to, any present or potential beneficial uses for such water;

B) The change in standards is necessary for economic or social development, by providing information including, but not limited to, the impacts of the standards on the regional economy, social disbenefits such as loss of jobs or closing of landfills, and economic analysis contrasting the health and environmental benefits with costs likely to be incurred in meeting the standards~~.~~; and

C) All technically feasible and economically reasonable methods are being used to prevent the degradation of the groundwater quality.

3) Notwithstanding subsection (b)(2), in no case shall the Board specify adjusted groundwater quality standards for a MSWLF unit greater than the following levels~~ set forth below~~:

~~Chemical~~	~~Concentration~~	Chemical	Concentration (mg/~~l~~
1)Arsenic	0.05	Barium	1.0
Benzene	0.005	Cadmium	0.01
Carbon tetrachloride	~~0.005~~		
~~Chromium (hexavalent)~~	~~0.05~~	2,4~~0~~0.005	2,4-Dichlorophenoxy acetic acid
~~0.1~~ 1,4~~0~~0.05	1,4-Dichlorobenzene	~~0.075~~ 1,2~~0~~0.1	1,2-Dichloroethane
~~0.005~~ 1,1~~0~~0.075	1,1-Dichloroethylene		
~~0.007~~ 0.005	Endrin	~~0.0002~~ 0.007	Fluoride
~~4~~ 0.0002	Lindane	4	Lead0.004
~~Lead~~	~~0.05~~	Mercury	~~0.002~~
0.05	Methoxychlor	~~0.1~~ 0.002	Nitrate ~~10~~
0.1	Selenium	~~0.01~~ 10	Silver ~~0.05~~
0.01	Toxaphene	~~0.005~~ 1,1,1~~0~~0.05	1,1,1-Trichloromethane
~~0.2~~	~~Trichloroethylene~~	0.005~~–~~	
~~2,4,5~~Thrichloroethylene	0.2	2,4,5-Trichlorophenoxy acetic acid	~~0.01~~
0.005	Vinyl Chloride	~~0.002~~0.01	

4) For groundwater which contains naturally occurring constituents which do not meet the standards of 35 Ill. Adm. Code ~~302.301, 302.304, and 302.305,620.410,~~620.410, 620.420, ~~620.430~~620.430, or 620.440, the Board will specify adjusted groundwater quality standards, upon a demonstration by the operator that:

A) The groundwater does not presently serve as a source of drinking water;

B) The change in standards will not interfere with, or become injurious to, any present or potential beneficial uses for such waters;

C) The change in standards is necessary for economic or social development, by providing information including, but not limited to, the impacts of the standards on the regional economy, social disbenefits such as loss of jobs or closing of landfills, and economic analysis contrasting the health and environmental benefits with costs likely to be incurred in meeting the standards; and

D) The groundwater cannot presently, and will not in the future, serve as a source of drinking water because:

i) It is impossible to remove water in usable quantities;

ii) The groundwater is situated at a depth or location such that recovery of water for drinking purposes is not technologically feasible or economically reasonable;

iii) The groundwater is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption;

iv) The total dissolved solids content of the groundwater is more than 3,000 mg/l and that water will not be used to serve a public water supply system; or

v) The total dissolved solids content of the groundwater exceeds 10,000 mg/l.

c) Determination of the Zone of Attenuation

1) The zone of attenuation, within which concentrations of constituents in leachate discharged from the unit may exceed the applicable groundwater quality standard of this Section, is a volume bounded by a vertical plane at the property boundary or 100 feet from the edge of the unit, whichever is less, extending from the ground surface to the bottom of the uppermost aquifer and excluding the volume occupied by the waste.

2) Zones of attenuation shall not extend to the annual high water mark of navigable surface waters.

3) Overlapping zones of attenuation from units within a single facility may be combined into a single zone for the purposes of establishing a monitoring network.

d) Establishment of Background Concentrations

1) The initial monitoring to determine background concentrations shall commence during the hydrogeological assessment required by Section 811.315. The background concentrations for those parameters identified in Sections 811.315(e)(~~1~~1)(G) and 811.319(a)(2) and (a)(3) shall be established based on consecutive quarterly sampling of wells for a minimum of one year, monitored in accordance with the requirements of subsections (d)(2), (d)(3) and (d)(4)~~, which may be adjusted during the operation of a facility~~. Non-consecutive data may be considered by the Agency, if only one data point from a quarterly event is missing, and it can be demonstrated that the remaining data set is representative of consecutive data in terms of any seasonal or temporal variation. Statistical tests and procedures shall be employed, in accordance with subsection (e), depending on the number, type and frequency of samples collected from the wells, to establish the background concentrations.

2) Adjustments to the background concentrations shall be made ~~only~~ if changes in the concentrations of constituents observed in ~~upgradientbackground~~background wells over time are determined, in accordance with subsection (e), to be statistically significant~~.~~, and due to natural temporal or spatial variability or due to an off-site source not associated with the landfill or the landfill activities. Such adjustments may be conducted no more frequently than once every two years during the operation of a facility and modified subject to approval by the Agency. Non-consecutive data may be used for an adjustment upon

Agency approval. Adjustments to the background concentration shall not be initiated prior to 2 years after final rule unless required by the Agency.

3) Background concentrations determined in accordance with this subsection shall be used for the purposes of establishing groundwater quality standards, in accordance with subsection (a). The operator shall prepare a list of the background concentrations established in accordance with this subsection. The operator shall maintain such a list at the facility, shall submit a copy of the list to the Agency for establishing standards in accordance with subsection (a), and shall provide updates to the list within ten days of any change to the list.

~~24~~4) A network of monitoring wells shall be established upgradient from the unit, with respect to groundwater flow, in accordance with the following standards, in order to determine the background concentrations of constituents in the groundwater:

A) The wells shall be located at such a distance that discharges of contaminants from the unit will not be detectable;

B) The wells shall be sampled at the same frequency as other monitoring points to provide continuous background concentration data, throughout the monitoring period; and

C) The wells shall be located at several depths to provide data on the spatial variability.

~~35~~5) A determination of background concentrations may include the sampling of wells that are not hydraulically upgradient of the waste unit where:

A) Hydrogeologic conditions do not allow the owner or operator to determine what wells are hydraulically upgradient of the waste; and

B) Sampling at other wells will provide an indication of background concentrations that is representative of that which would have been provided by upgradient wells.

~~46~~6) If background concentrations cannot be determined on site, then alternative background concentrations may be determined from actual monitoring data from the aquifer of concern, which includes, but is not limited to, data from another landfill site that overlies the same aquifer.

e) Statistical Analysis of Groundwater Monitoring Data

1) Statistical tests shall be used to analyze groundwater monitoring data. One or more of the normal theory statistical tests ~~listed in subsection (e)(4)~~ shall be chosen first for analyzing the data set or transformations of the data set. Where such normal theory tests are ~~demonstrated to be~~ inappropriate, tests listed in subsection (e)(~~5) or a test in accordance with subsection (e)(6~~4) shall be used. ~~Any statistical test chosen from subsections (e)(4) or (e)(5), the~~~~The~~The level of significance (Type I error level) shall be no less than 0.01, for individual well comparisons, and no less than 0.05, for multiple well comparisons. The statistical analysis shall include, but not be limited to, the accounting of data below the detection limit of the analytical method used, the establishment of background concentrations and the determination of whether statistically significant changes have occurred in:

A) The concentration of any chemical constituent with respect to the background concentration or maximum allowable predicted concentration; and

B) The established background concentration of any chemical constituents over time.

2) The statistical test or tests used shall be based upon the sampling and collection protocol of Sections 811.318 and 811.319.

3) Monitored data that are below the level of detection shall be reported as not detected (ND). The level of detection for each constituent shall be the ~~minimumpractical~~practical quantitation limit (PQL), and shall be the lowest concentration ~~of that constituent which can be measured and reported with 99 percent confidence that the true value is greater than zero, which is defined as the method detection limit (MDL)~~that is protective of human health and the environment, and can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions. In no case~~,~~ shall the PQL be established above the level that the Board has established for a groundwater quality standard under the Illinois Groundwater Protection Act [415 ILCS 55]. The following procedures shall be used to analyze such data, unless an alternative procedure in accordance with subsection (e)(~~64~~4), is shown to be applicable:

A) Where the percentage of nondetects in the data base used is less than 15 percent, the operator shall replace NDs with the ~~MDLPQL~~PQL divided by two, then proceed with the use of one or more of the Normal Theory statistical tests ~~listed in subsection (e)(4)~~;

B) Where the percentage of nondetects in the data base ~~or data transformations~~ used is between 15 and 50 percent, and the data are normally distributed, the operator shall use Cohen's or Aitchison's adjustment to the sample mean and standard deviation, followed by ~~one or more of the tests listed in subsection (e)(4)(C). However, where data are not normally distributed, the operator shall use an applicable nonparametric test from subsection (e)(5);~~an applicable statistical procedure;

C) Where the percentage of nondetects in the database used is above 50 percent, then the owner or operator shall use ~~the test of proportions listed in~~ an alternative procedure in accordance with subsection (e)(4).

4) ~~Normal theory~~Nonparametric statistical tests~~:~~

~~A)~~ ~~Student t~~ or any other statistical test ~~including, but not limited to, Cochran's Approximation to the Behren-Fisher (CABF) t-test and Averaged Replicate (AR) t-test.~~

~~B)~~ ~~Parametric analysis of variance (ANOVA) followed by one or more of the multiple comparison procedures including, but not limited to, Fisher's Least Significant Difference (LSD), Student Mewman-Kuel procedure, Duncan's New Multiple Range Test and Tukey's W procedure.C)~~ ~~Control Charts, Prediction Intervals and Tolerance Intervals, for which the type I error levels shall be specified by the Agency in accordance with~~, if it is demonstrated to meet the requirements of 35 Ill. Adm. Code 724.197(i).

~~5) Nonparametric statistical tests shall include: Mann-Whitney U-test, Kruskal-Wallis test, a nonparametric analysis of variance (ANOVA) for multiple comparisons or the Wilcoxon Rank Sum test.~~

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Format changed	0
Total changes	513

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE G: WASTE DISPOSAL
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER i: SOLID WASTE AND SPECIAL WASTE HAULING

PART 810
SOLID WASTE DISPOSAL: GENERAL PROVISIONS

Section
810.101 Scope and Applicability
810.102 Severability
810.103 Definitions
810.104 Incorporations by Reference
810.105 Electronic Reporting

AUTHORITY: Implementing Sections 7.2, 21, 21.1, 22, 22.17, and 22.40 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/7.2, 21, 21.1, 22, 22.17, 22.40, and 27].

SOURCE: Adopted in R88-7 at 14 Ill. Reg. 15838, effective September 18, 1990; amended in R93-10 at 18 Ill. Reg. 1268, effective January 13, 1994; amended in R90-26 at 18 Ill. Reg. 12457, effective August 1, 1994; amended in R95-9 at 19 Ill. Reg. 14427, effective September 29, 1995; amended in R96-1 at 20 Ill. Reg. 11985, effective August 15, 1996; amended in R97-20 at 21 Ill. Reg. 15825, effective November 25, 1997; amended in R04-5/R04-15 at 28 Ill. Reg. 9090, effective June 18, 2004; amended in R05-1 at 29 Ill. Reg. 5028, effective March 22, 2005; amended in R06-5/R06-6/R06-7 at 30 Ill. Reg. 4130, effective February 23, 2006; amended in R06-16/R06-17/R06-18 at 31 Ill. Reg. 1425, effective December 20, 2006; amended in R07-8 at 31 Ill. Reg. _____, effective _____.

Section 810.104 Incorporations by Reference

a) The Board incorporates the following material by reference:

1) Code of Federal Regulations:

40 CFR 3.2, as added at 70 Fed. Reg. 59848 (Oct. 13, 2005) (How Does This Part Provide for Electronic Reporting?), referenced in Section 810.105.

40 CFR 3.3, as added at 70 Fed. Reg. 59848 (Oct. 13, 2005) (What Definitions Are Applicable to This Part?), referenced in Section 810.105.

40 CFR 3.10, as added at 70 Fed. Reg. 59848 (Oct. 13, 2005) (What Are the Requirements for Electronic Reporting to EPA?), referenced in Section 810.105.

40 CFR 3.2000, as added at 70 Fed. Reg. 59848 (Oct. 13, 2005) (What Are the Requirements Authorized State, Tribe, and Local Programs' Reporting Systems Must Meet?), referenced in Section 810.105.

40 CFR 141.40 (2005) (Monitoring Requirements for Unregulated Contaminants).

~~Appendix II to 40 CFR 258 (2005), as corrected at 70 Fed. Reg. 44150 (August 1, 2005) (List of Hazardous and Organic Constituents).~~

40 CFR 258.Appendix I (2006).

40 CFR 258.Appendix II (2006).

2) American Institute of Certified Public Accountants, 1211 Avenue of the Americas, New York NY 10036:

Auditing Standards -- Current Text, August 1, 1990 Edition.

3) ASTM. American Society for Testing and Materials, 1976 Race Street, Philadelphia PA 19103 215-299-5585:

Method D2234-76, "Test Method for Collection of Gross Samples of Coal," approved 1976.

Method D3987-85, "Standard Test Method for Shake Extraction of Solid Waste with Water," approved 1985.

4) GASB. Government Accounting Standards Board, 401 Merritt 7, P.O. Box 5116, Norwalk CT 06856-5116:

Statement 18.

5) U.S. Army Corps of Engineers, Publication Department, 2803 52nd Ave., Hyattville, Maryland 20781, 301-394-0081:

Engineering Manual 1110-2-1906 Appendix VII, Falling-Head Permeability Cylinder (1986).

6) U.S. Government Printing Office, Washington, D.C. 20402, Ph: 202-783-3238:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," USEPA publication number EPA-530/SW-846 (Third Edition, 1986; Revision 6, January 2005), as amended by Update I (July 1992), II (September 1994), IIA (August 1993), IIB (January 1995), III (December 1996), IIIA (April 1998), and IIIB (November 2004) (document number 955-001-00000-1).

b) This incorporation includes no later amendments or editions.

(Source: Amended at 31 Ill. Reg. _____, effective _____)

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~~ILLINOIS REGISTER~~

~~POLLUTION CONTROL BOARD~~

~~NOTICE OF PROPOSED AMENDMENT~~

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Format changed	0
Total changes	11

1ST NOTICE VERSION

JCAR350810-0711107r01

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE G: WASTE DISPOSAL
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER i: SOLID WASTE AND SPECIAL WASTE HAULING

PART 810
SOLID WASTE DISPOSAL: GENERAL PROVISIONS

Section

AUTHORITY: Implementing Sections 7.2, 21, 21.1, 22, 22.17, and 22.40 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/7.2, 21, 21.1, 22, 22.17, 22.40, and 27].

SOURCE: Adopted in R88-7 at 14 Ill. Reg. 15838, effective September 18, 1990; amended in R93-10 at 18 Ill. Reg. 1268, effective January 13, 1994; amended in R90-26 at 18 Ill. Reg. 12457, effective August 1, 1994; amended in R95-9 at 19 Ill. Reg. 14427, effective September 29, 1995; amended in R96-1 at 20 Ill. Reg. 11985, effective August 15, 1996; amended in R97-20 at 21 Ill. Reg. 15825, effective November 25, 1997; amended in R04-5/R04-15 at 28 Ill. Reg. 9090, effective June 18, 2004; amended in R05-1 at 29 Ill. Reg. 5028, effective March 22, 2005; amended in R06-5/R06-6/R06-7 at 30 Ill. Reg. 4130, effective February 23, 2006; amended in R06-16/R06-17/R06-18 at 31 Ill. Reg. 1425, effective December 20, 2006; amended in R07-8 at 31 Ill. Reg. _____, effective _____.

Section 810.104 Incorporations by Reference

a) The Board incorporates the following material by reference:

1) Code of Federal Regulations:

40 CFR 3.2, as added at 70 Fed. Reg. 59848 (Oct. 13, 2005) (How Does This Part Provide for Electronic Reporting?), referenced in Section 810.105.

40 CFR 3.3, as added at 70 Fed. Reg. 59848 (Oct. 13, 2005) (What Definitions Are Applicable to This Part?), referenced in Section 810.105.

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Engineering Manual 1110-2-1906 Appendix VII, Falling-Head

Permeability Cylinder (1986).

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