SOLID WASTE
RULES AND REGULATIONS

Chapter 2

Draft Proposed Changes
Strikethrough/Underline Version
Revised October 26, 2012

TABLE OF CONTENTS

CHAPTER 2

~~SANITARY~~MUNICIPAL SOLID WASTE LANDFILL REGULATIONS

Section No.	Subject	Page No.
1.	In General	1
a)	Authority	1
b)	Applicability	1
c)	Objective	1
d)	Severability	1
e)	Reserved	1
f)	One-time or emergency waste management authorization	1
2.	Municipal Solid Waste Landfill Permit Application Requirements.	2
a)	Permit transition	5
b)	Permit application requirements	6
c)	Renewal application requirements	16
d)	Closure permit application requirements	18
e)	Permit terms	19
f)	Financial assurance requirement	20
g)	Permit amendments constituting a major change	20
3.	Location Standards	22
a)	New facilities	22
b)	Existing facilities	26
c)	Access roads	29
4.	Design and Construction Standards	29
a)	Surveyed corners	29
b)	Access restrictions	29
c)	Posting	30
d)	Access roads	30

e) Firelanes 30
f) Buffer zones 30
g) Topsoil 30
h) Structural stability 30
i) Surface water structures 31
j) Engineered containment system requirement 31
k) Design/construction of engineered containment systems 35
l) Volumetric capacity limit for refuse cells with engineered containment systems 37
m) Slope stability for excavations 37
n) Litter control structures 37
o) Methane control systems for on-site structures ... 37
p) Special waste management standards 37
q) Transfer, treatment and storage facility standards 37
5. Operating Standards 37
a) Qualified Solid Waste Manager 38
b) Copy of plan 39
c) Equipment/backup equipment 39
d) Access restrictions 39
e) Liquid wastes 39
f) Hazardous wastes 40
g) Dead animals 40
h) Traffic 40
i) Salvaging 40
j) Burning 40
k) Fire protection and other emergency protection measures 41
l) Litter 41
m) Vectors 41
n) Dust and odors 41
o) Working face 41
p) Compaction 41
q) Routine cover 41

r) Intermediate cover..... 43
s) Phased reclamation..... 44
t) Methane migration..... 44
u) Surface water contact..... 44
v) Surface water discharges..... 44
w) Groundwater contact..... 45
x) Groundwater discharges..... 45
y) Recordkeeping..... 45
z) Special waste management standards..... 47
aa) Transfer, treatment and storage facility standards: 47
bb) Annual reports..... 47
6. Monitoring Standards 49
a) Collection and management of samples..... 49
b) Groundwater monitoring..... 49
c) Methane..... 64
d) Air monitoring..... 64
e) Soil core monitoring..... 64
f) Vadose zone monitoring..... 64
g) Reporting of environmental monitoring data..... 64
7. Closure and Post-Closure Standards 65
a) Commencement of closure..... 65
b) Notification of closure..... 65
c) Prevention of erosion or ponding problems..... 65
d) Final cover..... 65
e) Revegetation..... 66
f) Surveyed corners..... 66
g) Notice on deed..... 67
h) Access control..... 67
i) Waste containment systems..... 67
j) Surface water structures..... 67
k) Environmental monitoring systems..... 67
l) Corrective action systems..... 67

m) Special waste management standards..... 67
n) Transfer, treatment, and storage facility standards 68
o) Certification of closure..... 68
p) Post-closure land use..... 68
q) Post-closure period..... 68
8. Standards for Corrective Action 70
a) Assessment of corrective measures..... 70
b) Selection of remedy..... 71
c) Corrective action implementation..... 75

Appendix A - Constituents for Detection Monitoring
Appendix B - Constituents for Assessment Monitoring

CHAPTER 2

~~SANITARY~~ MUNICIPAL SOLID WASTE LANDFILL REGULATIONS

Section 1. In General.

(a) Authority: The authority for the rules and regulations promulgated in this chapter is the Wyoming Environmental Quality Act, W.S. 35-11-101 et seq.

(b) Applicability: This chapter governs ~~sanitary~~municipal solid waste landfills.

(c) Objective: The objective of these rules and regulations is to set forth permit application requirements and to establish minimum standards for the location, design, construction, operation, monitoring, closure, and post-closure maintenance of ~~sanitary~~municipal solid waste landfills.

(d) Severability: If any section or provision of these regulations, or the application of that section or provision to any person, situation, or circumstance is adjudged invalid for any reason, the adjudication does not affect any other section or provision of these regulations or the application of the adjudicated section or provision to any other person, situation, or circumstance. The Environmental Quality Council declares that it would have adopted the valid portions and applications of these regulations without the invalid part, and to this end the provisions of these regulations are declared to be severable.

(e) Reserved

(f) One-time or emergency waste management authorization: The one-time or emergency waste management authorization procedure described in Chapter 1, Section 5, will not be considered for the land disposal of municipal solid wastes or mixed wastes.

Section 2. ~~Sanitary~~Municipal Solid Waste Landfill

Permit Application Requirements.

~~(a) Permit transition: The following rules concerning permit application submittals under Chapter 1, Section 2 will apply.~~

~~(i) Existing facilities:~~

~~(A) Existing facilities that have received wastes after September 13, 1989:~~

~~(I) The operator of any facility with a complete permit application or a permit that has not expired by September 13, 1989 shall be required to submit a renewal application, unless the operator elects to close the facility before January 1, 1994. The renewal application shall be submitted after January 1, 1992, as specified by the administrator, but no later than January 1, 1994.~~

~~(II) The operator of any facility without a complete application or valid permit on September 13, 1989 shall either:~~

~~(1.) Submit a renewal application after September 13, 1989, as specified by the administrator, but no later than October 1, 1990; or~~

~~(2.) Submit a closure permit application after September 13, 1989, as specified by the administrator, but no later than January 1, 1991, and cease receipt of wastes within six (6) months following submission of a closure permit application but no later than July 1, 1991.~~

~~(B) Existing facilities that have not received wastes after September 13, 1989:~~

~~(I) The operator may be required to submit a closure permit application upon request by the administrator.~~

~~(II) The administrator may request such an application whenever the administrator has reason~~

~~to believe that health and safety hazards are present, there has been evidence of environmental contamination, or the facility does not comply with the location, monitoring, closure or post-closure standards.~~

~~(ii) New facilities:~~

~~(A) The operator of any new facility with a complete application or a valid permit on September 13, 1989 shall be required to submit a renewal application, unless the operator elects to close the facility before January 1, 1994. The renewal application shall be submitted by January 1, 1994. For any new facility with a complete application which has met public notice requirements in accord with the Wyoming Solid Waste Management Rules and Regulations, 1975, the director may issue initial letters of approval for construction and operation under those rules.~~

~~(B) The operator of any other new facility shall submit a permit application in accordance with the permit application procedures specified in Chapter 1, Section 2(b) and 2(c).~~

~~(iii) Closing facilities:~~

~~(A) Anticipated closure: The operator of a facility with a valid permit on September 13, 1989, or a valid permit or renewal permit issued under Chapter 1, Section 2(d) or Section 2(f), shall submit a closure permit application to the administrator between 270 and 180 days prior to the anticipated facility closure.~~

~~(B) Unanticipated closure: In the event any solid waste management facility ceases operation, as determined by nonreceipt of solid wastes for any continuous nine (9) month period, the facility operator shall provide written notification to the administrator no later than thirty (30) days after the end of such nine (9) month period. This notification shall be accompanied by a closure permit application unless the administrator approves interim measures with delayed final closure for good cause upon application by the operator.~~

(C) Facilities closing because the operator cannot make the demonstration required in Section 3(b) of this chapter: Existing facilities which must close because the operator cannot make the demonstration required in Section 3(b)(i)(A) [airport proximity], Section 3(b)(i)(B) [floodplains], or Section 3(b)(i)(F) [unstable areas] of this chapter must close by October 9, 1996, in compliance with the requirements of Section 7 of this chapter. A closure permit under section 2(d) of this chapter is also required. The closure deadline specified in this subsection may be extended by up to two (2) years if the owner demonstrates to the administrator that:

(I) There is no available alternative disposal capacity; and

(II) There is no immediate threat to human health and the environment.

(iv) All sanitary landfills shall be subject to the standards contained in Chapter 15 of these rules, until such time as they are permitted under Chapter 1, Section 2, except that all existing sanitary landfills shall comply with the following standards contained in this chapter:

(A) Section 3(b) [location standards],

(B) Sections 4(j) and 4(k) [engineered containment systems],

(C) Section 4(o) [methane control systems for onsite structures],

(D) Section 5(a) [qualified solid waste manager],

(E) Section 5(d) [unauthorized access],

(F) Section 5(e) [liquid wastes],

(G) Section 5(f) [hazardous wastes],

(H) Section 5(j) [burning]

~~(I) Section 5(q) [routine cover],~~

~~(J) Section 5(t) [methane migration],~~

~~(K) Section 5(v) [surface water discharges],~~

~~(L) Section 5(y) [recordkeeping], and~~

~~(M) Section 7 [closure and post-closure standards].~~

(a) Permit transition: The following rules concerning permit application submittals under Chapter 1, Section 2 will apply.

(i) Existing facilities:

(A) Existing facilities that have received wastes after September 13, 1989:

(I) Existing facilities with closure permits issued before July 1, 2012, shall continue closure and post-closure under their existing permits.

(II) Existing facilities that intend to cease disposal of all waste before July 1, 2017, need not submit a renewal application, but shall submit a closure permit application no later than twelve (12) months prior to the expiration date of the facility's existing permit or the date the facility is anticipated to cease disposal of waste, whichever comes first.

(III) Existing facilities that do not have a lifetime permit and intend to continue disposal of waste after July 1, 2017, shall submit a permit renewal application twelve (12) months prior to the expiration of their current permit.

(B) Existing facilities that have not received wastes after September 13, 1989:

(I) The operator may be required to

submit a closure permit application upon request by the administrator.

(II) The administrator may request such an application whenever the administrator has reason to believe that health and safety hazards are present, there has been evidence of environmental contamination, or the facility does not comply with the location, monitoring, closure or post-closure standards.

(ii) New facilities:

(A) The operator of any new facility shall submit an operating permit application in accord with the requirements set forth in these rules.

(iii) Closing facilities:

(A) Anticipated closure: For facilities where disposal of all waste is anticipated to cease before July 1, 2017, the operator shall submit a closure permit application no later than twelve (12) months prior to the expiration date of the facility's existing permit or the date the facility is anticipated to cease disposal of waste, whichever comes first. For facilities where disposal is anticipated to continue after July 1, 2017, the operator shall submit a closure permit application no later than twelve (12) months prior to the date the facility is anticipated to cease disposal of waste.

(B) Unanticipated closure: In the event any solid waste management facility ceases operation, as determined by nonreceipt of solid wastes for any continuous nine (9) month period, the facility operator shall provide written notification to the administrator no later than thirty (30) days after the end of such nine (9) month period. This notification shall be accompanied by a closure permit application unless the administrator approves interim measures with delayed final closure for good cause upon application by the operator.

(b) Permit application requirements:

(i) All permit application forms shall be

signed by the operator, the landowner and any real property lien holder of public record. All applications shall be signed by the operator under oath subject to penalty of perjury. All persons signing the application shall be duly authorized agents. The following persons are considered duly authorized agents:

(A) For a municipality, state, federal or other public agency, by the head of the agency or ranking elected official;

(B) For corporations, at least two principal officers;

(C) For a sole proprietorship or partnership, a proprietor or general partner, respectively.

(ii) All permit applications shall be prepared under the supervision of a professional engineer registered in the State of Wyoming. All permit application forms shall be stamped, signed and dated by a professional engineer. In addition, all portions of the permit application which require geological services or work shall be stamped, signed and dated by a professional geologist.

(iii) The permit application shall contain a completed application form, and the information required in this subsection.

(A) A written report shall be submitted containing the following information:

(I) The name, address and telephone number of the legal operator of the facility to whom the permit would be issued and, at a minimum, a summary, listing of any administrative order, civil or administrative penalty assessment, bond forfeiture, civil, misdemeanor, or felony conviction, or court proceeding for any violations of any local, state or federal law occurring within a minimum of five (5) years of application submittal relating to environmental quality or criminal racketeering, of the solid waste manager, the

applicant, or if the applicant is a partnership or corporation, any partners in the partnership or executive officers or corporate directors in the corporation;

(II) Name, address and telephone number of the solid waste manager. A description of the solid waste manager training and examination program to be used by the operator to assure compliance with the requirements of Chapter 2, Section 5(a). The description shall include a specific listing of the training courses, and the required frequency of attendance at each course by the solid waste manager;

(III) Legal description of the property to be used as a disposal site. The complete legal description shall consist of a plat and legal description, monumented and signed in accordance with W.S. 33-29-111, by a Wyoming licensed land surveyor;

(IV) A brief narrative describing the disposal facility. The narrative should include an estimate of the size of the facility, the type of waste disposal activities that are planned (area fill, trench fill, special waste areas) and the type, amount, and source of incoming waste. The narrative should also describe the service area of the disposal facility;

(V) Information describing surface and mineral ownership of the site and surface ownership of all lands within one (1) mile of the facility boundary;

(VI) Demonstration that the facility meets the minimum location standards specified in Chapter 2, Section 3.

(VII) A summary description of any available regional geologic or hydrologic information, including copies of all available well logs for wells located within one (1) mile of the proposed site.

(VIII) Any information known to the applicant that would limit the site's suitability as a ~~sanitary~~municipal solid waste landfill.

(IX) Site specific data describing the underlying soils, geology and groundwater, including:

(1.) A description of the soil types according to the Unified Soil Classification System, and the estimated thickness of the unconsolidated soil materials;

(2.) Information on the geologic conditions, including structure, bedrock types, estimated thickness and attitude, and fracture patterns;

(3.) Identification of unstable areas caused by natural features or man-made features or events, and which may result in geologic hazards including, but not limited to, slope failures, landslides, rockfalls, differential and excessive settling or severe erosion;

(4.) Identification of any seismic impact zones, fault areas, floodplains, and wetlands;

(5.) Depth to the uppermost groundwater. Information on groundwater aquifer thickness and hydrologic properties such as the groundwater flow direction and rate, and the potentiometric surface;

(6.) Existing quality of groundwater beneath the facility; identification of background water quality data;

(7.) Supporting documentation such as well completion logs, geologic cross-sections, soil boring lithologic logs, potentiometric surface maps and soil or groundwater testing data should be supplied as an appendix.

(X) A detailed description of the facility operating procedures, site design and construction methods. The description shall include the following information:

(1.) The service area (source of wastes) and the type and quantity of waste (on a daily, weekly or monthly basis) that will be disposed at the facility;

(2.) Estimated site capacity, in tons and cubic yards of waste, and site life, including the calculations on which these estimates are based;

(3.) An evaluation of the facility's potential to impact surface and groundwater quality, based on the facility design and the hydrogeologic information required in subsection (b)(iii)(A)(IX) of this section;

(4.) An evaluation of the availability of cover material sufficient to properly operate the facility through the closure period;

(5.) A detailed description of the facility liners, caps, berms, or other containment devices that will be used, along with the methods of construction and associated construction quality control program;

(6.) A description of the systems used for monitoring, collection, treatment and disposal of leachate, if required;

(7.) A description of the fire and other emergency protection measures;

(8.) A description of the topsoil handling procedures to be used, including measures to be used to protect the piles from erosion;

(9.) A description of the signs that will be posted to identify the landfill and listing the information required in Chapter 2, Section 4(c);

(10.) A description of the litter control program, including the frequency for litter collection for internal fences, perimeter roads and off-site areas special operating procedures to be used during

periods of high wind, and a summary of any wind speed and direction data available for the local area;

(11.) Type and amount of equipment to be provided at the site for excavating, earth moving, spreading, compaction and other needs; the specific purpose for each piece of equipment and the source and procedure used to obtain backup equipment;

(12.) A description of the special waste areas, and how they will be operated;

(13.) Any other information necessary to demonstrate compliance with the design, construction and operating standards specified in Chapter 2, Section 4 and Chapter 2, Section 5.

(XI) A detailed descriptive statement of the environmental monitoring program, including the following information:

(1.) A description of the monitoring well location, design, construction, and development;

(2.) A description of the groundwater sampling program including sampling frequency, test parameters, sampling procedures, test methods and quality control;

(3.) A description of the methane gas system for venting and/or monitoring including system location, design and construction;

(4.) A description of the methane gas monitoring frequency, procedures and test parameters, if required;

(5.) Any other information necessary to demonstrate compliance with the monitoring standards specified in Chapter 2, Section 6.

(XII) A detailed descriptive statement of the closure/post-closure stage of landfill

development, including the following information:

(1.) A description of the land use anticipated after closure;

(2.) The wording of the deed notice;

(3.) A copy of the notice of closure for the public;

(4.) A description of the final soil cover, as well as methods used to revegetate the site;

(5.) The method and length of time that surface water will be diverted from the site;

(6.) The methods by which surface erosion or water ponding problems will be corrected, including the frequency of planned inspections to discover such problems during the post-closure period;

(7.) The method by which any environmental monitoring systems and corrective action systems will be maintained, including the time period over which this will occur;

(8.) The length of time and method by which the operator will maintain access restrictions to any closed facility;

(9.) Any other information necessary to demonstrate compliance with the closure/post-closure standards specified in Chapter 2, Section 7.

(B) An original USGS topographic map with a scale of 1:24,000 with the proposed facility location shown; an original USGS topographic map with a scale of 1:62,500 or other suitable topographic map may be submitted if a 1:24,000 map is unavailable.

(C) A map or aerial photograph of the area shall be submitted showing land ownership, land use and

zoning within one (1) mile of the disposal site. The map or photograph shall be of sufficient scale to show all city boundaries, each occupied dwelling house, schools, hospitals, industrial buildings, water wells, water courses, roads and other applicable details and shall indicate the general topography.

(D) A general facility plot plan at a scale not greater than 200 feet to the inch with five (5) foot contour intervals shall be submitted. The general facility plot plan shall illustrate the following features:

(I) Facility boundaries, including any buffer zones proposed between the solid waste boundary and the property boundary;

(II) Points of access;

(III) Location of soil borings, groundwater monitor wells, and methane monitor wells;

(IV) Location of proposed trenches or area fill locations;

(V) Working area/perimeter fire lane;

(VI) Locations of any facility buildings to house equipment or for other uses;

(VII) Working area/perimeter fence location;

(E) Additional facility plot plans at the same scale as the general facility plot plan, shall be submitted as necessary to show orderly development and use of the facility through the life of the site. These plot plans shall contain the following information:

(I) Excavation plans for development of trenches or preparation of area fill locations.

(II) Development of temporary surface water diversion structures which may be necessary to

adequately control surface water run-on and run-off;

(III) Access to active waste disposal areas, including development of internal roads;

(IV) Daily cover stockpile locations;

(V) Topsoil storage pile locations;

(VI) Litter screen placement information;

(VII) Location of special waste management or disposal areas;

(VIII) Other details pertinent to the development and use of the facility.

~~(F) As an alternative to subsection (b)(iii)(E) of this section, which requires site development plans to be supplied for the life of the site, the applicant may submit detailed site development plans containing information specified in subsection (b)(iii)(E) but covering only the first permit term.~~

~~(G) For Type II facilities, site development information may be depicted on the general plot plan required in subsection (b)(iii)(D) of this section. For these facilities the administrator may waive the requirement to prepare sequential plot plans as required in subsection (b)(iii)(E) of this section.~~

(~~H~~F) A map showing proposed final contours prepared at a scale no greater than 200 feet to the inch, with five (5) foot contour intervals, shall be submitted.

(~~I~~G) Cross sections and/or drawing details shall be submitted with sufficient specifications to describe:

(I) Internal litter catch screens or fences;

(II) Working area/perimeter fencing;

(III) Access roads;

(IV) Trench or area fill method;

(V) Special waste areas, where appropriate;

(VI) Systems used for monitoring, collection, treatment and disposal of leachate, if required;

(VII) Groundwater monitoring well design;

(VIII) Methane gas venting and monitoring system;

(IX) Surface and subsurface drain systems to control run-on and run-off and/or inflow;

(X) All components of engineered containment systems, if applicable, which include, but are not limited to, liners, caps and berms;

(XI) Any other design details requested by the administrator.

(~~J~~H) A copy of the recordkeeping log maintained during the operating life and closure/post-closure maintenance period shall be submitted.

(~~K~~I) Facilities for which engineered containment systems are required shall submit construction quality assurance/quality control (QA/QC) plans describing the following construction and testing characteristics:

(I) For engineered clay barrier layers, the QA/QC plan shall describe how clay moisture content will be maintained or adjusted, the technique by which lift thickness will be maintained, the manner in which clay lifts will be compacted, the method used to measure clay moisture content and density in the field during construction, and the frequency of moisture content

and density testing.

(II) For synthetic membranes, the QA/QC plan shall describe the method used to test 100% of all seams for leaks, the frequency of destructive testing for seam strength, the layout pattern for each roll of membrane material, the procedure to be followed for post-installation defect identification and repair, the results of testing or literature review which demonstrates the compatibility of the membrane material with the waste and/or waste leachate, and the procedures used to assure each roll of membrane material meets the manufacturer's specifications for material properties.

(III) For lateral drainage layers, the QA/QC plan shall describe the method used to assure achievement of the approved grain size uniformity and layer thickness for granular layers, the method by which drainage layers shall be installed without damaging any imbedded leachate collection system, leak detection system or membrane, and the installation procedure for the filter fabric or granular filter layer overlying the drainage layer.

(iv) The permit application shall contain information demonstrating compliance with the standards in Chapters 6, 7, 8, and/or 10, if applicable.

(c) Renewal application requirements:

(i) Renewal applications shall be submitted as required in Chapter 1, Section 2(e).

(A) Each renewal application ~~submitted in accordance with the requirements of subsection (a) of this section,~~ shall include a compilation of any available previous permit application materials and supplemental information updated and revised as necessary to fulfill the information requirements specified in subsection (b) of this section, except for (b)(iii)(A)(V) [mineral and surface ownership] and (b)(iii)(A)(VIII) [site suitability].

(B) Each renewal application submitted in

accordance with the requirements of Chapter 1, Section 2(e)~~(ii)~~ shall include a copy of the approved permit application or the previous approved renewal permit application, with drawings and narrative updated and revised as necessary to document the facility operations and activities carried out during the previous permit ~~periods~~term. If such activities differed from those in the approved permit or previously approved renewal permit, the ~~narrative should~~application shall describe the minor changes and approved major amendments. The applicant shall have the option to submit copies of only the updated and revised portion of the previous application, if the revised and updated pages and drawings are appropriately numbered and dated to facilitate incorporation into the previous permit document.

(ii) All renewal applications shall contain the following information:

(A) Any necessary plan revisions for the upcoming permit renewal period. Any requests for approval of amendments~~ which describe major changes in facility operation~~;

(B) Detailed construction and operation specifications for the upcoming permit period, if such specifications were not included in an approved facility permit application~~ in accord with subsection (b)(iii)(F) of this section~~;

(C) Assessment of site life remaining. If less than five (5) years of capacity remains, a description of steps taken to secure a new facility or alternate waste management options shall be included;

(D) Description of intermediate reclamation efforts, with evaluation of revegetation results;

(E) A description of steps taken to mitigate or correct practices that have resulted in past operational deficiencies; and

(F) Any necessary information

demonstrating compliance with the standards in Chapters 6, 7, 8 and/or 10, if applicable.

(d) Closure permit application requirements:

(i) Closure permit applications shall be submitted as required in Section 2(a) of this chapter.

(A) Each closure permit application submitted in accordance with the requirements of Section 2(a) of this chapter, shall contain the following information in addition to the information required in subsection (d)(i)(B) of this section:

(I) A narrative describing the site operating history including the dates of operation, the disposal methods used and the types and amounts of waste accepted;

(II) A general facility plot plan at a scale not greater than 200 feet to the inch illustrating past areas of waste deposition, estimated dates of fill and any other pertinent features;

(III) Data on site geology and hydrology as specified in subsections (b)(iii)(A)(VII) and (b)(iii)(A)(IX) of this section;

(IV) A map of the site area as specified in subsection (b)(iii)(C) of this section;

(V) An evaluation of the facility's potential to impact surface water and groundwater quality, based on the hydrogeologic information and the facility's design and operating history.

(B) Each closure permit application shall contain a permit application form signed in the manner described in Sections 2(b)(i) and 2(b)(ii) of this chapter and the following information; a copy of the pertinent materials from the approved permit application or approved renewal permit application, revised and updated as necessary, may be used to fulfill these requirements:

(I) General site information specified in subsections (b)(iii)(A)(I) through (b)(iii)(A)(III) of this section;

(II) Environmental monitoring system information specified in subsection (b)(iii)(A)(XI) of this section;

(III) Closure/post-closure information specified in subsection (b)(iii)(A)(XII) of this section;

(IV) A final contour map specified in subsection (b)(iii)(H) of this section; and

(V) Any supporting documentation listed in subsections (b)(iii)(I) and (J) of this section that is pertinent to the closure/post-closure phase.

(ii) The closure permit application requirements shall contain information demonstrating compliance with the closure standards in Chapters 6, 7 and/or 8, if applicable.

(e) Permit terms:

~~(i) Type I sanitary landfill permits will be issued for a four (4) year term, and Type II sanitary landfill permits will be issued for an eight (8) year term.~~

~~(ii) Renewal permits for Type I sanitary landfills will be issued for four (4) year terms, and renewal permits for Type II sanitary landfills will be issued for eight (8) year terms.~~

(i) Effective July 1, 2012, new municipal solid waste landfill operating permits and renewal permits for existing municipal solid waste landfills shall be lifetime permits.

(ii~~i~~) Closure permits ~~will~~shall be ~~issued~~ for a period which includes the time required to complete closure activities and the minimum post-closure term

specified ~~at~~ in Section 7(~~b~~g) of this chapter. The closure permit period will extend until the administrator finds that the facility has been adequately stabilized and the environmental monitoring or control systems have demonstrated that the facility closure is protective of human health and the environment consistent with the purposes of the act.

(f) Financial assurance requirement: Any operator of a ~~sanitary~~municipal solid waste landfill subject to the financial assurance requirements of Chapter 7 shall provide and maintain adequate assurance of financial responsibility as specified therein, prior to issuance of a permit by the director.

(g) Permit amendments constituting a major change: All amendments constituting a major change shall comply with the location, design and construction, operating, monitoring, financial assurance and closure standards of the applicable chapters of these rules and regulations. No amendment shall be implemented by the operator without the prior written authorization of the administrator.

(i) The operator shall submit two (2) complete paper copies and one (1) complete electronic copy of the proposed amendment. Permit amendments may be proposed independently or in conjunction with a permit renewal or closure permit application. Permit amendments may be proposed in conjunction with annual reports, but must be separately designated as amendments. Permit amendments proposed in conjunction with annual reports will be processed in accordance with Chapter 1, Section 3 of these rules. The application shall include a cover letter describing in detail the amendment sought. The application for amendment shall include revisions to the permit application sufficient to fully describe the proposed amendment including a revised table of contents and replacement text, plates, and/or drawings which are fully formatted and numbered for insertion into the permit application.

(ii) The administrator shall conduct a completeness review and notify the applicant within sixty (60) days of receipt of the application whether or not it

is complete. If the administrator deems the application incomplete, he or she shall so advise and state in writing to the applicant the information required. All items not specified as incomplete at the end of the first sixty (60) day period shall be deemed complete for the purposes of this subsection.

(A) If the applicant resubmits an application or further information, the administrator shall review the application or additional information within sixty (60) days of each submission and advise the applicant in writing if the application is complete.

(B) After the application is determined complete, the applicant shall give written notice of the application as required in Chapter 1, Section 2(b)(i)

(iii) The administrator shall review the application and unless the applicant requests a delay, advise the applicant in writing within ninety (90) days from the date of determining that the application is complete, that a proposed permit amendment is suitable for publication under Chapter 1, Section 2(b)(ii), or that the application is deficient, or that the application is denied. All reasons for deficiency or denial shall be stated in writing to the applicant. All items not specified as being deficient at the end of the first ninety (90) day period shall be deemed sufficient for the purposes of this subsection.

(A) If the applicant submits additional information in response to any deficiency notice, the administrator shall review such additional information within thirty (30) days of submission and advise the applicant in writing if a proposed permit amendment is suitable for publication, or that the application is still deficient, or that the application is denied.

(B) If the application is determined to be complete and demonstrates compliance with the applicable standards, the administrator shall prepare a proposed permit amendment. The applicant shall provide public notice as specified in Chapter 1, Section 2(b)(ii).

(C) If no hearing is requested, the director shall render a decision on the proposed permit amendment within thirty (30) days after completion of the notice period. If substantial written objections are received by the director by 5:00 pm on the last day of the public comment period, a public hearing will be held within twenty (20) days after the last day of the public comment period, unless a different schedule is deemed necessary by the council. The council or director shall publish notice of the time, date, and location of the hearing in a newspaper of general circulation in the county where the applicant plans to locate the facility or where the facility is located, once a week for two (2) consecutive weeks immediately prior to the hearing. The hearing shall be conducted as a contested case in accordance with the Wyoming Administrative Procedures Act, and right of judicial review shall be afforded as provided in that Act. The director shall issue or deny the permit amendment no later than fifteen (15) days from receipt of any findings of fact and decision of the environmental quality council.

(D) In granting permit amendments, the director may impose such conditions as may be necessary to accomplish the purpose of the act and which are not inconsistent with the existing rules, regulations, and standards.

Section 3. Location Standards.

(a) New facilities: New ~~sanitary~~municipal solid waste landfills shall not be located in violation of the standards described in this section.

(i) Airport proximity: Facilities containing putrescible wastes capable of attracting birds are prohibited within 5,000 feet of any airport runway used by only piston-type aircraft, and within 10,000 feet of any airport runway used by turbojet aircraft. Effective April 5, 2000, new municipal landfill units must comply with Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century. The Wendell H. Ford Aviation Investment and Reform Act for the 21st Century requires that after April 15, 2000, no new facility that

receives putrescible waste capable of attracting birds shall be constructed within 6 miles of a public airport that has received grants under 49 U.S.C. Chapter 471 and is primarily served by general aviation aircraft and regularly scheduled flights of aircraft designed for 60 passengers or less unless the Wyoming Department of Transportation, Aeronautics Division requests that the Administrator of the Federal Aviation Administration exempt the landfill from this requirement and the Administrator determines that such exemption would have no adverse impact on aviation safety. For the purposes of this section putrescible waste means solid waste which contains organic matter capable of being decomposed by microorganisms and of such a character and proportion as to be capable of attracting or providing food for birds.

(ii) Local zoning ordinances: Facility locations shall not be in conflict with local zoning ordinances or land use plans that have been adopted by a county commission or municipality.

(iii) Distance to residences and other buildings: Except upon a variance granted by the director in accord with W.S. 35-11-502(c), no facility greater than one (1) acre in size shall be located between 1,000 feet and one (1) mile of a public school except with the written consent of the school district board of trustees, or between 1,000 feet and one (1) mile of an occupied dwelling house except with the written consent of the owner. Additionally, facilities of any size shall not be located within 1,000 feet of any occupied dwelling house, school or hospital, and shall not be located within 300 feet of any building unless provisions have been made for protection from methane gas accumulation.

(iv) Distance to roads and parks:

(A) Except upon a variance granted by the director in accord with W.S. 35-11-502(c), no facility greater than one (1) acre in size shall be located between 1,000 feet and one-half (½) mile of the center line of the right-of-way of a state or federal highway unless screened from view as approved by the administrator. Additionally, facilities of any size shall not be located within 1,000

feet of any interstate or primary highway right-of-way, unless the facility is screened from view by natural objects, plantings, fences or other appropriate means, and is authorized by the state highway commission in accord with provisions of the Junkyard Control Act, W.S. 33-19-103 et seq.

(B) Facilities shall not be located within 1,000 feet of any public park or recreation area unless the facility is screened from view by natural objects, plantings, fences or other appropriate means.

(v) Distance to drinking water sources: Except upon a variance granted by the director in accord with W.S. 35-11-502(c), no facility greater than one (1) acre in size shall be located between 1,000 feet and one-half (½) mile of a water well permitted or certificated for domestic or stock watering purposes except with written consent of the owner of the permit or certificate. Additionally, facilities of any size shall not be located within 1,000 feet of any drinking water source such as a well or surface water intake.

(vi) Distance to other surface waters:

(A) Facilities shall not be located within 1,000 feet of any perennial lake or pond which is either naturally occurring, or which contains water used for any purpose not directly related to an industrial process.

(B) Facilities shall not be located within 300 feet of any industrial process water or storm water management pond.

(C) Facilities shall not be located within 300 feet of any perennial river or stream.

(vii) Floodplains: Facilities shall not be located within the boundaries of a 100-year floodplain.

(viii) Wetlands: Facilities shall not be located in wetlands.

(ix) Wild and Scenic Rivers Act: Facility locations shall not diminish the scenic, recreational and

fish and wildlife values for any section of river designated for protection under the Wild and Scenic Rivers Act, 16 USC 1271 et seq., and implementing regulations.

(x) National Historic Preservation Act: Facilities shall not be located in areas where they may pose a threat to an irreplaceable historic or archeological site listed pursuant to the National Historic Preservation Act, 16 USC 470 et seq. and implementing regulations, or to a natural landmark designated by the National Park Service.

(xi) Endangered Species Act: Facilities shall not be located within a critical habitat of an endangered or threatened species listed pursuant to the Endangered Species Act, 16 USC 1531 et seq., and implementing regulations, where the facility may cause destruction or adverse modification of the critical habitat, may jeopardize the continued existence of endangered or threatened species or contribute to the taking of such species.

(xii) Big game winter range~~/grouse breeding grounds~~: Facilities shall not be located within critical winter ranges for big game ~~or breeding grounds for grouse,~~ unless after ~~consultation with~~considering information from the Wyoming Game and Fish Department, the administrator determines that facility development would not conflict with the conservation of Wyoming's wildlife resources.

(xiii) Fault areas: Facilities shall not be located within 200 feet of a fault that has had displacement in Holocene time.

(xiv) Avalanche areas: Facilities shall not be located in documented avalanche prone areas.

(xv) Hydrogeologic conditions: Facilities shall not be located in an area where the administrator, after investigation by the applicant, finds that there is a reasonable probability that solid waste disposal will have a detrimental effect on surface water or groundwater quality.

(xvi) Distance from incorporated cities or towns: Except upon a variance granted by the director in accord with W.S. 35-11-502(c), no facility greater than one (1) acre in size shall be located within one (1) mile of the boundaries of an incorporated city or town.

(xvii) Compliance with other standards: Facilities which are also subject to regulation under Chapters 6 or 8 of these rules and regulations shall not be located in violation of the standards in those chapters.

(b) Existing facilities:

(i) Applicability: Effective on the dates specified in paragraph (b)(ii) of this section, existing ~~sanitary~~municipal solid waste landfills must make the following determinations demonstrating that the requirements of this paragraph have been met, place those determinations in the operating record of the facility, and notify the administrator that the determinations have been placed in the operating record:

(A) Airports: Existing facilities, new landfill ~~cells~~units at existing facilities, and horizontal expansions of area fills at existing facilities, shall not be located within 10,000 feet (3,048 meters) of any airport runway end used by turbojet aircraft or within 5,000 feet (1,524 meters) of any airport runway end used by only piston-type aircraft, unless the owner demonstrates to the administrator that the facilities, ~~cells~~units, or area fills are designed and operated so that they do not pose a bird hazard to aircraft. Owners proposing to place solid wastes in new landfill ~~cells~~units at existing facilities, or place solid wastes onto horizontal expansions of area fills at existing facilities which are located within a five-mile radius of any airport runway end used by turbojet or piston-type aircraft must notify the affected airport and the federal aviation administration;

(B) Floodplains: Existing facilities, new landfill ~~cells~~units at existing facilities, and horizontal expansions of area fills at existing facilities, shall not

be located within the boundaries of a 100-year floodplain, unless the owner demonstrates to the administrator that the facility, ~~cell~~unit, or fill will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to pose a hazard to human health and the environment;

(C) Wetlands: New landfill ~~cells~~units at existing facilities, and horizontal expansions of area fills at existing facilities, shall not be located in wetlands unless the owner demonstrates to the administrator that:

(I) There is no practicable alternative location;

(II) There will not be a violation of any state or federal water quality standard, the Endangered Species Act of 1973, or the Marine Protection, Research, and Sanctuaries Act of 1972;

(III) The ~~cell~~unit or area fill will not cause or contribute to degradation of the wetlands, considering all factors necessary to demonstrate that ecological resources in the wetlands are sufficiently protected including:

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

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

(3) The volume and chemical nature of the waste managed in the unit;

(4) Impacts on fish, wildlife, and other aquatic resources and their habitat from release of the waste;

(5) The potential effects of catastrophic release of waste to the wetland and the

resulting impacts on the environment;

(6) Any additional factors, as necessary, to demonstrate that ecological resources in the wetland are sufficiently protected;

(IV) There will be no net loss of wetlands, considering any mitigation steps taken by the owner; and

(V) The owner has sufficient information to make a reasonable determination with respect to items (I) through (IV) of this subsection;

(D) Fault areas: New landfill ~~cells~~units at existing facilities, and horizontal expansions of area fills at existing facilities, shall not be located within 200 feet (60 meters) of a fault that has had displacement in Holocene time, unless the owner demonstrates to the administrator that an alternative setback distance of less than 200 feet (60 meters) will prevent damage to the structural integrity of the ~~cell~~unit or area fill and will be protective of human health and the environment;

(E) Seismic impact zones: New landfill ~~cells~~units at existing facilities, and horizontal expansions of area fills at existing facilities, shall not be located in seismic impact zones, unless the owner demonstrates to the administrator that all containment structures, including liners, leachate collection systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site;

(F) Unstable areas: ~~Existing facilities, n~~New landfill ~~cells~~units at existing facilities, and horizontal expansions of area fills at existing facilities, shall not be located in an unstable area unless the owner has demonstrated to the administrator that engineering measures have been incorporated into the facility's, ~~cell's~~unit's, or area fill's design to ensure that the integrity of the structural components of the facility, ~~cell~~unit, or area fill will not be disrupted. The demonstration must consider:

(I) On-site or local soil conditions that may result in significant differential settling;

(II) On-site or local geologic or geomorphologic features; and

(III) On-site or local human-made features or events (both surface and subsurface).

~~(ii) The location standards of paragraph (b) of this section are effective on the following dates:~~

~~(A) October 9, 1993, for Type I sanitary landfills;~~

~~(B) April 9, 1994, for Type I sanitary landfills which receive less than one hundred (100) tons per day of municipal solid wastes; and~~

~~(C) October 9, 1997, for Type II sanitary landfills.~~

(c) Access roads: The ~~R~~roads leading to ~~sanitary~~municipal solid waste landfills shall not be subject to the location standards described in this section.

Section 4. Design and Construction Standards. Each facility shall be designed and constructed in compliance with the standards listed in this section.

(a) Surveyed corners: All site boundary corners shall be surveyed and marked with permanent survey caps.

(b) Access restrictions:

(i) The working area of all facilities shall be fenced in such a manner as to discourage people and livestock from entering the facility and to contain litter within the facility. Additional fencing may be required to restrict access to reclaimed areas or other areas that may present public health and safety hazards.

(ii) All access roads shall be equipped with a gate which can be locked when the facility is unattended.

(c) Posting: Each point of access shall be identified by a sign, which shall be easily readable and shall be maintained in good condition, and which contains at a minimum the following information:

(i) The facility name;

(ii) The name and phone number of the responsible person to contact in the event of emergencies;

(iii) The hours of operation;

(iv) Wastes that are prohibited from disposal at the facility;

(v) A requirement to notify the landfill operator of any asbestos wastes.

(d) Access roads: Facility access roads shall be constructed to enable use under inclement weather conditions.

(e) Firelanes: All facilities shall have a fire lane which is a minimum of ten (10) feet wide around all active solid waste management units or within the perimeter fence.

(f) Buffer zones: All facilities shall have a buffer zone which is a minimum of twenty (20) feet within the facility perimeter fence.

(g) Topsoil: Topsoil from all disturbed areas shall be stripped and stockpiled in an area which will not be disturbed during facility operation. These stockpiles shall be identified by signs, and vegetated as required for stabilization. This topsoil will be used for site reclamation. Topsoil shall not be removed from the facility without written authorization from the administrator.

(h) Structural stability: Engineering measures

shall be incorporated into the landfill design and construction to ensure stability of structural components in unstable areas, fault areas, and seismic impact zones. Landfill designs in unstable areas shall consider the factors described in Section 3(b)(i)(F). Landfill designs in seismic impact zones shall consider the factors described in Section 3(b)(i)(E).

(i) Surface water structures: Surface water structures shall be designed and constructed to control surface water run-on and run-off as follows:

(i) Temporary structures anticipated to be used for periods less than five (5) years shall accommodate a 25-year, 24-hour precipitation event;

(ii) Permanent structures and temporary structures anticipated to be used for five (5) years or longer shall accommodate a 100-year, 24-hour precipitation event.

(iii) Sediment control structures shall be designed and constructed in accordance with Chapter 11 of the Water Quality Division Rules and Regulations.

(j) Engineered containment system requirement: The following engineered containment system requirements are set out in W.S. 35-11-526 and W.S. 35-11-527.

(i) Performance based design and performance based evaluation in consideration and approval of engineered containment systems as part of municipal solid waste landfill permits.

(A) A person submitting an application for a permit pursuant to W.S. 35-11-502 which contains a performance based design for a municipal solid waste landfill that does not incorporate an engineered containment system utilizing a composite liner and leachate collection system, shall submit a report with the application. The report shall contain the applicant's findings as to the proposed performance based design's compliance with applicable state and federal laws and regulations. The report shall contain scientific and

engineering data supporting the implementation of the proposed design.

(B) In reviewing scientific and engineering data related to a permit application and report containing a performance based design which does not incorporate an engineered containment system utilizing a composite liner and leachate collection system, the administrator shall prepare a detailed performance evaluation based on applied scientific and engineering data that adheres to W.S. 35-11-527. The administrator shall determine in the performance evaluation whether to validate or invalidate the performance based design or an alternative performance based standard for landfill design contained in the permit application. The administrator shall base the performance based evaluation on acceptable applied scientific and engineering data and an analysis of that data using statistical procedures, including statistical power, when applicable.

(C) The applicant or other interested party may appeal the administrator's determination contained in a performance based evaluation of a permit pursuant to W.S. 35-11-502. If the council determines that the performance based evaluation does not accurately or adequately identify and evaluate all the data and criteria required under this section and W.S. 35-11-527, the council shall direct the administrator to reevaluate his determination. A decision by the council that the performance based evaluation is accurate and adequate shall be a final decision of the agency pursuant to the Wyoming Administrative Procedure Act.

(ii) Performance based design evaluation criteria for municipal solid waste landfill units.

(A) New municipal solid waste landfill units and lateral expansions approved by the administrator under W.S. 35-11-502 and 35-11-526 shall be constructed:

(I) In accordance with a performance based design approved by the administrator in a performance based evaluation pursuant to W.S. 35-11-526. Any performance based design approved must ensure that the

concentration values for pollutants listed in the National Primary Drinking Water Regulations, 40 C.F.R. Part 141, will not be exceeded in the uppermost aquifer at the relevant point of compliance as determined under subsection (c) of this section; or

(II) With an engineered containment system that utilizes a composite liner and a leachate collection system that is designed and constructed to maintain less than a thirty (30) centimeter depth of leachate over the liner.

(B) When approving a design that complies with paragraph (a)(i) of this section, in addition to the requirements of W.S. 35-11-526 the administrator shall consider other relevant factors, including, but not limited to:

(I) The hydrogeologic characteristics of the facility and surrounding land;

(II) The climatic factors of the area; and

(III) The physical and chemical characteristics and volume of the leachate.

(C) The relevant point of compliance specified by the administrator for the allowable concentration values for pollutants under paragraph (a)(i) of this section shall be no more than one hundred fifty (150) meters from the waste management unit boundary and shall be located on land owned by the owner of the municipal solid waste landfill. In determining the relevant point of compliance, the administrator shall consider at least the following factors:

(I) The hydrogeologic characteristics of the facility and surrounding land;

(II) The physical and chemical characteristics and volume of the leachate;

(III) The quantity, quality and

direction of flow of ground water in the area;

(IV) The proximity and withdrawal rate of ground water users;

(V) The availability of alternative sources of drinking water supplies;

(VI) The existing quality of the ground water, including other sources of contamination and their cumulative impacts on the ground water and whether the ground water is currently used or reasonably expected to be used for drinking water;

(VII) Public health, safety and welfare effects; and

(VIII) Practicable capability of the owner or operator.

~~(i) Applicability: Effective on the dates specified in paragraph (j)(ii) of this section, new Type I sanitary landfills, new landfill cells at existing Type I sanitary landfills, and horizontal expansions of area fills at existing Type I sanitary landfills must meet the requirements of Sections 4(j) and 4(k) of this chapter, unless the operator demonstrates to the administrator that all of the following conditions are met:~~

~~(A) Native soils underlying the landfill are sufficiently impermeable to prevent potential contamination of groundwater through operation of the facility; and~~

~~(B) Waste types or operating practices minimize the potential for contamination of underlying soils and/or groundwater; and~~

~~(C) Site hydrologic conditions are sufficient to protect groundwater from contamination; and~~

~~(D) The facility receives less than 500 short tons of unprocessed household refuse or mixed household and industrial refuse per operating day, on a~~

~~monthly average. Containment systems at these facilities shall include leachate collection and leak detection systems.~~

~~(ii) The engineered containment system requirements of paragraph (i) of this section are effective on the following dates:~~

~~(A) October 9, 1993, for Type I sanitary landfills; and~~

~~(B) April 9, 1994, for Type I sanitary landfills which receive less than one hundred (100) tons per day of municipal solid wastes.~~

~~(iii) For Type II facilities, the administrator may determine, based on consideration of the factors in paragraph (j)~~(i) of this section, ~~that an engineered containment system is required to protect public health and the environment. Following such a determination, the administrator shall notify the facility owner or operator and shall specify an effective date for the determination. The owner or operator shall be required to comply with the requirements of paragraph (j) of this section for any new trench or expansion of any new area fill at the facility constructed after the effective date of the administrator's notification.~~

(k) Design/construction of engineered containment systems: Engineered containment systems shall be designed and constructed to meet these standards:

(i) Engineered barrier layers forming caps and/or liners constructed of clay shall have a maximum vertical hydraulic conductivity of 1 x 10E-7 cm/sec (0.1 ft/yr). These barrier layers shall have a minimum thickness of 24 inches. Clay barrier layers shall be constructed in lifts which do not exceed six (6) inches in thickness, and uniform compaction of these lifts shall be assured through the use of appropriate equipment. Clay barrier layers forming a cap shall be overlain by a layer of soil which is of suitable thickness to protect the clay barrier layer from frost penetration.

(ii) All engineered containment system components shall be supported by material of sufficient bearing strength to prevent subsidence and failure of any component. This bearing strength shall be documented through materials testing as specified by the administrator.

(iii) Synthetic membranes used as part of any containment system shall be of a material and thickness which is suitable for the intended use, but in no case shall be less than 0.030 inches thick (30 mils). All synthetic membranes shall be underlain by a suitable bedding material.

(iv) Lateral drainage layers included in composite cap and liner system designs shall be composed of either granular material or a synthetic drain net of suitable lateral permeability to promote acceptable drainage, as approved by the administrator. Lateral drainage layers shall be protected from soil clogging by either a synthetic filter fabric or a graded granular layer of a design approved by the administrator.

(v) Leachate collection systems installed as part of an engineered containment system shall be sized and designed to efficiently collect and transport leachate. Leak detection systems shall be designed to efficiently identify failure of the overlying barrier layer.

(vi) The quality assurance/quality control (QA/QC) plan for engineered containment systems shall assure adequate construction and testing of the containment system components, as called for in the design specifications in the facility plan.

(vii) Detailed design plans, including but not limited to plans for liners, leachate collection and management systems, caps and associated QA/QC plans shall be submitted as part of the lifetime permit or renewal as applicable. Additional or modified detailed design plans for engineered containment systems shall be submitted as a minor change unless a design change is proposed that constitutes a major change.

(l) Volumetric capacity limit for refuse ~~cells~~units with engineered containment systems: No refuse ~~cell~~unit for which an engineered containment system is required shall have a volumetric capacity of greater than 1,000,000 cubic yards, unless the operator can demonstrate that the liner leak detection system is capable of isolating the location of any leak which occurs in the primary liner.

(m) Slope stability for excavations: Trench walls shall not exceed a ratio of 1.5:1 (horizontal:vertical) unless a slope stability analysis demonstrates steeper slopes can be safely constructed and maintained. This analysis may be based on site specific soil stability calculations or Wyoming Occupational Safety and Health Administration regulations for excavations.

(n) Litter control structures: Litter control structures shall be designed and constructed to control litter within the facility.

(o) Methane control systems for on-site structures: All structures on the landfill facility will be designed to prevent the accumulation of methane such that the concentration of methane gas in facility structures does not exceed twenty-five percent (25%) of the lower explosive limit (LEL) for methane.

(p) Special waste management standards: Any facility used for the management of a special waste regulated under Chapter 8, Special Waste Management Standards, shall also comply with the applicable design and construction standards established under Chapter 8.

(q) Transfer, treatment and storage facility standards: Any facility used for the transfer, treatment or storage of solid wastes shall also comply with the applicable design and construction standards established under Chapter 6.

Section 5. Operating Standards. All facilities shall be operated in accordance with the standards described in this section.

(a) Qualified Solid Waste Manager: Each facility shall be managed by a qualified solid waste manager. In the event that a qualified solid waste manager terminates employment for any reason, a new solid waste manager shall be designated within three (3) months of such termination. For any facility which is constructed, operated and monitored in compliance, the solid waste manager's qualifications shall be presumed to be adequate. For any facility which is not being constructed, operated, or monitored in compliance, the solid waste manager may be required to complete additional training and/or demonstrate his or her qualifications by written or oral examination. A qualified solid waste manager shall:

(i) Possess a complete working knowledge of the facility construction, operating and monitoring procedures, as specified in the permit application and the permit letter issued by the director.

(ii) Attend the classroom or field training program described in the approved permit application, which shall include training for the identification of PCB wastes and hazardous wastes regulated under Subtitle C of the Federal Resource Conservation and Recovery Act and the state hazardous wastes rules and regulations.

(iii) Attend any training course sponsored by the administrator, which the administrator requires to provide training on changes to state or federal solid waste rules or guidelines. For any such mandatory training course, the administrator shall provide each operator with a minimum of ninety (90) days notice prior to the scheduled training course.

(iv) Comply with the requirements of this subsection:

(A) No later than six (6) months following assumption of responsibility for operating a facility, for a new solid waste manager; or

(B) No later than six (6) months following the date the facility is permitted under this chapter, for an existing solid waste manager.

(b) Copy of plan: A copy of the operating plan shall be available at the facility when landfill personnel are on-site.

(c) Equipment/backup equipment: All facilities shall have equipment that is adequate to deposit, compact and cover refuse. In the event of equipment breakdown, backup equipment shall be obtained to insure compliance with the compaction and covering requirements of these rules and regulations.

(d) Unauthorized access:

(i) Public access shall be controlled and unauthorized vehicular traffic and illegal dumping of wastes shall be prevented by using artificial barriers, natural barriers, or both, as appropriate to protect human health and the environment.

(ii) Effective on the dates in paragraph (f)(iii) of this section, facility access gate(s) shall be closed and locked to restrict access by the public to the active disposal area of the facility at the end of each operating day.

(iii) The requirements of paragraph (f)(ii) of this section shall be effective on:

(A) October 9, 1993, for Type I ~~sanitary~~municipal solid waste landfills;

(B) April 9, 1994, for Type I ~~sanitary~~municipal solid waste landfills receiving less than one hundred (100) tons per day of municipal solid wastes; and

(C) October 9, 1997, for Type II ~~sanitary~~municipal solid waste landfills.

(e) Liquid wastes: Bulk or noncontainerized liquid wastes may not be placed in a ~~sanitary~~municipal solid waste landfill, unless the facility has been permitted by the director to receive such wastes at a separate solid

waste management unit or unless the wastes have been treated to pass the paint filter liquids test. Containerized liquid wastes that are not household wastes, and are in containers that are larger than those normally disposed by households, may not be placed in a ~~sanitary~~municipal solid waste landfill unless the facility has been permitted by the director to receive such wastes and the wastes have been treated to pass the paint filter liquids test.

(f) Hazardous wastes:

(i) No ~~sanitary~~municipal solid waste landfill may accept regulated quantities of hazardous wastes. Hazardous waste excluded under Subtitle C of the Federal Resource Conservation and Recovery Act and Chapter 2 of the state hazardous waste rules and regulations may be accepted if specific authorization is granted in writing by the administrator;

(ii) The facility operator shall implement a program of random inspections of incoming solid wastes or take other steps to detect and prevent the disposal of regulated hazardous wastes and PCB wastes; and

(iii) The facility operator shall promptly notify the administrator if regulated hazardous wastes or PCB wastes are discovered at the facility.

(g) Dead animals: Dead animals shall be covered daily whenever carcasses are disposed. Dead animals may be disposed with municipal solid waste or in a separate area.

(h) Traffic: Signs shall be posted to direct traffic to the proper area for dumping.

(i) Salvaging: Salvaging, if permitted, shall be conducted in such a manner as not to interfere with normal operations.

(j) Burning: No open burning of solid waste is allowed, with the exception of infrequent burning of clean wood, tree trimmings, brush, agricultural wastes,

silvicultural wastes, land clearing debris, diseased trees, or debris from emergency cleanup operations; this exception is valid only when the operator has obtained a permit from the Air Quality Division.

(k) Fire protection and other emergency protection measures: Facilities shall maintain, at a minimum, an unobstructed ten (10) foot firelane around all solid waste management units or within the perimeter fence. The landfill personnel shall have access to portable fire extinguishers when on-site. Depending on the facility location, personnel may be required to have a communication system (radio, telephone, etc.) with which to alert the local fire department.

(l) Litter: Each facility shall maintain an effective routine litter collection program. These routine programs shall take place both within the landfill perimeter, as well as off-site. Special operating practices may be required for use during high wind periods.

(m) Vectors: On-site populations of disease vectors shall be prevented or controlled using techniques appropriate for the protection of human health and the environment.

(n) Dust and odors: Adequate measures shall be taken to minimize dust and odors.

(o) Working face: The working face shall be confined to the smallest practical area using signs and physical barriers, if necessary. All solid wastes shall be deposited in a manner to limit windblown litter.

(p) Compaction: All solid waste shall be effectively compacted in order to reduce long-term settling and conserve landfill space.

(q) Routine cover:

(i) Effective October 9, 1995, Type I ~~sanitary~~municipal solid waste landfills shall cover all solid waste, excluding those wastes listed in paragraph

(s)(ii) of this section, which have been received during the day with an approved cover material at the end of each day that the facility is open for the receipt of wastes.

(ii) Effective October 9, 1997, Type II ~~sanitary~~municipal solid waste landfills shall install an approved cover material over all solid waste, excluding those wastes listed in paragraph (q)(iii) of this section, which have been received as per the following schedule:

(A) At the end of each day that the facility is open to the public if the facility accepts for disposal more than ten (10) tons of municipal solid wastes daily;

(B) A minimum of once every seven (7) days if the facility accepts for disposal an average of less than ten (10) but more than three (3) tons of municipal solid wastes daily;

(C) A minimum of once every sixteen (16) days if the facility accepts for disposal an average of less than three (3) tons of municipal solid wastes daily;

(D) Prior to October 9, 1997, Type II ~~sanitary~~municipal solid waste landfills shall be subject to the minimum periodic soil cover requirements specified in Section 7 of Chapter 15 of these rules.

(iii) Solid wastes which are not subject to the routine cover requirements of this paragraph are:

(A) Brush, tree trimmings, and clean wood intended to be burned periodically under authority of Section 5(k) of this chapter;

(B) Scrap tires managed in compliance with the requirements of Chapter 8 of these rules;

(C) Inert construction/demolition debris, which is to be covered as described in the facility permit application and subject to any permit limitation;

(D) White goods, cars, or other metallic

wastes being stored for shipment to a metal recycler, if stored as described in the facility permit application;

(E) Petroleum contaminated soils being managed in compliance with the requirements of Chapter 8 of these rules;

(F) Friable asbestos wastes being managed in compliance with the requirements of Chapter 8 of these rules; and

(G) Any other solid wastes which the administrator determines to be unlikely to cause, or to contribute to, disease vectors, fires, odors, blowing litter, and scavenging.

(iv) An approved cover material shall be:

(A) Any cover including no less than six (6) inches of compacted soil or any alternative material approved by the administrator to adequately control infiltration, disease vectors, fires, odors, blowing litter, and scavenging;

(B) For balefills, no less than six (6) inches of compacted soil, or any alternative material approved by the administrator to adequately control disease vectors, fires, odors, blowing litter, and scavenging, applied to the top and sides of an active balefill disposal area; balefill operations shall not be required to cover the vertical working face of the balefill facility, unless required by the administrator to control litter, fire, odor, disease vectors, or scavenging.

(v) At any facility where an alternate daily routine cover material has been approved for use by the administrator, the owner or operator shall adequately compact all wastes and apply no less than six (6) inches of compacted soil at least once every thirty (30) calendar days, as a fire control measure.

(r) Intermediate cover: For any area where wastes will not be disposed for a period of 180 days, that area

shall be covered with the required six (6) inches of cover material and an additional twelve (12) inches of intermediate cover.

(s) Phased reclamation: All completed refuse fill areas shall be promptly reclaimed with final cover, topsoil and revegetation in order to stabilize the landfill surface and reduce the potential for leachate generation.

(t) Methane migration:

(i) Facilities shall be operated such that the concentration of methane gas in facility structures and at the facility boundary does not exceed twenty-five percent (25%) of the lower explosive limit (LEL) for methane. If methane levels exceeding the limits specified in this paragraph are detected, the operator must:

(A) Immediately notify the administrator and take steps to protect human health

(B) Within seven (7) days of detection, place a copy of the methane test data in the operating record, and a written description of the steps taken to protect human health; and

(C) Within sixty (60) days of detection, implement a remediation plan which has been approved by the administrator, and place a copy of that plan in the operating record.

(ii) The administrator may establish alternative schedules for demonstrating compliance with the requirements of paragraphs (t)(i)(B) and (t)(i)(C) of this section.

(u) Surface water contact: Standing or running water shall not be allowed to come into contact with solid waste. Adequate measures shall be taken to prevent and/or alleviate ponding of water over filled areas. Surfaces shall be graded to promote lateral surface water run-off.

(v) Surface water discharges: Facilities shall be

operated such that leachate, contaminated groundwater, and/or surface water run-off from the active portion of the facility is not allowed to enter any waters of the United States, either on-site or off-site, unless authorized by a National Pollutant Discharge Elimination System (NPDES) permit issued pursuant to the Clean Water Act. Facilities shall not be operated to cause a violation of any requirement of the Clean Water Act, including Sections 402 pertaining to NPDES permits, and Sections 208 or 319 pertaining to area-wide or state-wide nonpoint source discharge water quality management plans.

(w) Groundwater contact: Wastes shall not be allowed to be placed in contact with groundwater.

(x) Groundwater discharges: Solid waste disposal facilities shall not be allowed to alter groundwater quality, as determined by groundwater monitoring.

(y) Recordkeeping:

(i) The following records shall be maintained at the facility or an approved alternative location and available for inspection and copying as specified by Chapter 1, Section 1(g):

(A) Log of litter collection activities specifying the dates and areas of litter collection;

(B) Log of refuse compaction and covering procedures specifying the dates on which compaction and covering operations were conducted, areas compacted and covered;

(C) Types and disposition of special wastes, specifying the volume, date of disposition, and source of waste;

(D) Records of waste sold or otherwise salvaged;

(E) Record of any problems causing operations to cease, including but not limited to fire or equipment failure;

(F) Copy of the department permit letter;

(ii) The owner or operator shall maintain through the end of the post-closure period, in addition to the records required in paragraph (y)(i) of this section, an operating record which shall contain the following information:

(A) Any permit application prepared under Section 2(b), 2(c), or 2(d) of this chapter;

(B) If not contained in the permit application, any location restriction demonstration which is required under Section 3(b) of this chapter;

(C) Log of random inspections or other screening activities for regulated hazardous wastes and PCB wastes specifying the date, time, and name(s) of the inspection personnel, as required under Section 5(f)(ii) of this chapter, and any notifications to the administrator under Section 5(f)(iii) of this chapter;

(D) Records of training of landfill operators to detect hazardous wastes and PCB wastes required under Section 5(a)(ii) of this chapter;

(E) Methane monitoring results prepared under Section 6 of this chapter, and any methane notification or remediation plan prepared under Section 5(t) of this chapter;

(F) Groundwater monitoring results, and any other groundwater demonstration, certification, or finding not already contained in the permit application, which is required under this chapter;

(G) As-built specifications for length, width and depth of trenches, and location;

(H) Dates when trenches completed, and contents of the trench;

(I) Closure and post-closure plans, if not already contained in the permit application, and any

monitoring, testing, or analytical data required in the plans;

(J) Any cost estimates and financial assurance documentation required under Chapter 7 of these rules and regulations;

(K) Any information demonstrating the classification of the landfill as a Type I or Type II landfill as defined in Chapter 1, Section 1(e) of these rules and regulations; and

(L) If not contained in the permit application, any engineered containment demonstration which is required under Section 4(j) of this chapter.

(M) Dates when reclamation activities take place.

(z) Special waste management standards: Any facility used for the management of a special waste regulated under Chapter 8, Special Waste Management Standards, shall also comply with the applicable operating standards established under Chapter 8.

(aa) Transfer, treatment and storage facility standards: Any facility used for the transfer, treatment or storage of solid wastes shall also comply with the applicable operating standards established under Chapter 6.

(bb) Annual reports:

(i) Facilities with lifetime permits: Effective January 1, 2012, every operator shall file an annual report with the administrator on or within thirty (30) days prior to the anniversary date of each lifetime permit. The report shall include:

(A) The facility name, the name and address of the operator and the permit number;

(B) A report in such detail as the administrator shall require supplemented with maps, cross sections, aerial photographs, photographs or other

material indicating:

(I) The extent to which the landfill operations have been carried out;

(II) The progress of all landfill work;

(III) The extent to which regulatory requirements, expectations and predictions made in the original permit or any previous annual reports have been fulfilled, and any deviation there from, including but not limited to the capacity of landfill used, the results of any environmental monitoring, any remediation required or completed and the remaining usable municipal solid waste landfill capacity.

(C) A revised schedule or timetable of landfill operations and an estimate of the available capacity to be affected during the next one (1) year period.

(ii) Upon receipt of the annual report the administrator shall make such further inquiry as deemed necessary. If the administrator objects to any part of the report or requires further information he shall notify the operator as soon as possible and shall allow a reasonable opportunity to provide the required information, or take such action as necessary to resolve the objection.

(iii) Within forty-five (45) days after the receipt of the annual report the administrator shall conduct an inspection of the landfill. A report of this inspection shall be made a part of the operator's annual report and a copy shall be delivered to the operator.

(iv) Within sixty (60) days after receipt of the annual report, inspection report and other required materials, if the administrator finds the annual report in order and consistent with the landfill operation plan and solid waste management plan as set forth in the permit, or as amended to adjust to conditions encountered during landfill operations as provided by law, the director shall

determine if any adjustment is necessary to the size of the bond required pursuant to W.S. 35 11 504.

(v) Landfill gas reporting: The following information related to landfill gas emissions shall be reported annually in a format specified by the administrator and may be part of the annual report set forth in this subsection:

(A) The maximum design capacity of the landfill in megagrams (Mg) and cubic meters (m3) of waste, including any modifications or expansions in the last year which have increased or decreased the maximum design capacity in megagrams (Mg) and cubic meters (m3) of waste. If the design capacity is converted from mass to volume or volume to mass, the calculations must be provided. Information regarding the site-specific waste density and how it was estimated must also be provided.

Section 6. Monitoring Standards. All facilities required to institute monitoring shall meet the standards described in this section.

(a) Collection and management of samples: Groundwater, soil core, vadose zone, and decomposition gas samples shall be collected and managed in accordance with department guidance or equivalent methods approved by the administrator.

(b) Groundwater monitoring:

(i) Except as provided in paragraph (b)(i)(A) of this section, Type I landfills shall comply with the following groundwater monitoring requirements:

(A) Applicability:

(I) The administrator may suspend the groundwater monitoring requirements of paragraph (B) of this section if the owner or operator demonstrates that there is no potential for migration of hazardous constituents from the facility to the uppermost aquifer. This demonstration must be made by a qualified scientist or engineer, and must consider:

(1.) Site-specific field measurements, and information about the specific wastes to be disposed at the facility; and

(2.) Contaminant fate and transport predictions, including use of the hydrologic evaluation of landfill performance model, which maximize contaminant migration and consider impacts on human health and the environment.

(II) Owners and operators of Type I landfills must comply with the requirements of paragraph (b) of this section as follows, unless an alternate schedule is approved by the administrator under paragraph (b)(i)(A)(III) of this section:

(1.) Facilities less than one (1) mile from a drinking water intake or well, by October 9, 1994;

(2.) Facilities less than two (2) miles but greater than one (1) mile from a drinking water intake or well, by October 9, 1995;

(3.) Facilities greater than two (2) miles from a drinking water intake or well, by October 9, 1996; and

(4.) New facilities must be in compliance before wastes are deposited in the facility.

(III) The administrator may establish schedules of compliance for individual existing solid waste disposal facilities with the requirement of paragraph (b)(i) of this section, provided that half of all existing facilities are in compliance by October 9, 1994 and all are in compliance by October 9, 1996. The administrator shall consider potential risks to human health and the environment in establishing an alternate schedule of compliance for an individual facility.

(IV) Once established at a facility, the groundwater monitoring program shall be conducted

throughout the active life and post-closure care period for the facility, unless modified by the administrator under paragraphs (b)(i)(D) or (b)(i)(E) of this section.

(V) The administrator may establish an alternate schedule for compliance with any deadline specified in paragraphs (b)(i)(B), (b)(i)(C), (b)(i)(D), or (b)(i)(E) of this section, or Section 8(c) of this chapter.

~~(VI) The groundwater monitoring requirements of paragraph (b)(i) of this section do not apply to the following facilities:~~

~~(1.) Type I landfills receiving one hundred (100) tons per day or less of solid wastes which ceased receiving wastes before April 9, 1994, and~~

~~(2.) Type I landfills receiving greater than one hundred (100) tons per day of solid wastes which ceased receiving wastes before October 9, 1993.~~

(B) Groundwater monitoring systems:

(I) A groundwater system must be installed which consists of a sufficient number of wells to monitor water from the uppermost aquifer which may be affected by leakage from the facility. The system must be capable of monitoring background and downgradient water quality. Well locations must be approved by the administrator, and downgradient wells shall be placed in locations ~~as close as possible but in no case greater than~~within 150 meters ~~from~~of the ~~disposal facility waste boundary~~ waste management unit boundary on land owned, leased, or otherwise controlled by the operator.

(II) The administrator may approve a groundwater monitoring system designed to monitor groundwater from the facility, in lieu of individual waste disposal trenches, if the system is determined to be capable of adequately detecting groundwater pollution. In approving a facility-wide groundwater monitor system, the administrator shall consider:

(1.) Number, spacing, and orientation of the individual waste units at the facility;

(2.) Hydrologic setting;

(3.) Site history and design; and

(4.) Type of waste accepted at the individual waste units at the facility.

(III) The design of the groundwater monitoring system must be based on site-specific information on aquifer thickness, aquifer properties, groundwater flow direction and rate (including seasonal variations), and on geologic information on the soils, any aquitards, aquicludes, or confining formations, at the site. The design of the system must be approved by the administrator. The owner or operator must include the system design information in the facility operating record, within fourteen (14) days of the date of approval of the system design by the administrator.

(C) Groundwater sampling and analysis requirements:

(I) Each facility must have an approved groundwater sampling and analytical plan and maintain that plan as a part of the facility permit application. The plan must address:

(1.) Sample collection;

(2.) Sample preservation and shipment;

(3.) Analytical procedures;

(4.) Chain of custody control; and

(5.) Quality assurance and quality control.

(II) The groundwater sampling and analysis methods must be appropriate and accurate. Sample handling procedures shall be as required by the administrator. Groundwater samples shall not be field filtered prior to laboratory analysis.

(III) Groundwater elevations must be measured in each well prior to purging for sample collection, each time groundwater is sampled. The owner or operator must determine groundwater flow direction at each sampling event. The owner or operator must measure or calculate groundwater flow rate(s) as appropriate to establish an adequate groundwater monitoring system, or when requested to do so by the administrator.

(IV) The owner or operator must establish background water quality in a hydraulically upgradient or other background well approved by the administrator.

(V) Prior to conducting the statistical analysis of groundwater data, the owner or operator shall collect a sufficient number of samples to meet the requirements of the statistical analysis procedure selected under paragraph (b)(i)(C)(VI) of this section.

(VI) The owner or operator must include in the permit application a description of the statistical method to be used to evaluate groundwater quality data. The statistical test shall be conducted separately for each hazardous constituent in each well. The owner or operator may select any of the following statistical analysis procedures:

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

(2.) An analysis of variance

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

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

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

(5.) Another statistical method approved by the administrator.

(VII) Any statistical method chosen under paragraph (b)(i)(C)(VI) of this section shall comply with the following performance standards:

(1.) The method shall be appropriate for the distribution of chemical parameters or constituents. If the distribution is not normal, then the data should be transformed or a distribution-free theory test should be used. If the distributions for different constituents differ, more than one statistical method may be needed;

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

(3.) If a control chart approach is used to evaluate groundwater monitoring data, the specific type of control chart and its associated parameter values must be approved by the administrator;

(4.) If a tolerance interval or a predictional interval is used to evaluate groundwater monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be approved by the administrator;

(5.) Any data reported as below detection limits shall be entered into the statistical analysis as a value equal to one-half the practical quantitation limit (PQL) for the constituent. The PQL shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility; and

(6.) If approved by the administrator, the statistical method may include procedures to adjust data to account for seasonal and spatial variability, as well as temporal correlation.

(VIII) The owner or operator must determine whether or not there is a statistically significant increase over background values for each parameter or constituent required in the particular groundwater monitoring program that applies to the facility under paragraph (b)(i)(D) or (b)(i)(E) of this section, as follows:

(1.) The owner or operator must compare the groundwater quality of each parameter or constituent at each monitoring well using the approved statistical method; and

(2.) Within thirty (30) days after completing sampling and analysis, the owner or operator must determine whether there has been a statistically significant increase over background at each monitoring well.

(D) Detection monitoring:

(I) Each facility shall institute a detection monitoring program by sampling each well at least semiannually, and testing each sample for the constituents specified in Appendix A, unless the administrator:

(1.) Deletes a constituent because the owner or operator shows that it is not likely to be present in the waste disposed at the facility;

(2.) Establishes an alternate list of inorganic constituents which provide a reliable indication of inorganic releases from the facility, considering the following factors:

a. The types, quantities, and concentrations of constituents in wastes managed at the facility;

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

c. The detectability of indicator parameters, waste constituents, and reaction products in the groundwater; and

d. The concentration or values and coefficients of variation of monitoring parameters or constituents in the groundwater background; or

(3.) Determines that a different, but no less frequent than annual, monitoring schedule is appropriate, considering the following factors:

a. Lithology of the aquifer and unsaturated zone;

b. Hydraulic conductivity

of the aquifer and unsaturated zone;

c. Groundwater flow rates;

d. Minimum distance between the edge of the waste boundary at the facility and the downgradient monitor well(s); and

e. The classification of the aquifer under Chapter 8 of the Water Quality Rules and Regulations.

(II) A minimum of four (4) individual samples is required to be collected and analyzed from each well (background and downgradient) during the first year of sampling. At least one (1) sample must be collected and analyzed from each well during subsequent sampling events, which must be conducted on the sampling frequency determined under paragraph (b)(i)(D)(I) of this section.

(III) If a statistically significant difference in water quality between background and any downgradient well is detected, the operator must:

(1.) Notify the administrator and place a note in the facility operating record within fourteen (14) days and start assessment monitoring within ninety (90) days as provided in paragraph (b)(i)(E) of this section; or

(2.) Demonstrate to the administrator that the statistically significant water quality difference is not due to the solid waste disposal facility, but that the difference is due to another source of pollution, error in sampling, analysis or statistical evaluation, or natural variation in groundwater quality. The owner or operator shall prepare a report documenting this demonstration, and following approval by the administrator, place the report in the operating record for the facility. If the report is approved, the owner or operator shall continue detection monitoring as required in paragraph (b)(i)(D) of this section. If, after ninety (90) days, a successful demonstration is not made, the owner or operator must initiate an assessment monitoring

program as required in paragraph (b)(i)(E) of this section.

(E) Assessment monitoring:

(I) Assessment monitoring is required whenever a statistically significant increase over background water quality has been detected under paragraph (b)(i)(D) of this section.

(II) Within ninety (90) days of triggering an assessment monitoring requirement, and annually thereafter, the owner or operator must sample and analyze all downgradient monitor wells for all Appendix B constituents. A minimum of one (1) sample from each downgradient well must be collected during each annual sampling event. If any Appendix B constituent is detected in any downgradient well, the owner or operator must promptly collect a minimum of four (4) additional independent samples from each background and downgradient well. These samples must be analyzed for each Appendix B constituent which was detected in the initial assessment monitoring sampling event.

(III) The administrator may specify an appropriate subset of wells to be sampled and analyzed during assessment monitoring, and may delete Appendix B constituents from the monitoring requirements if it can be shown that the deleted constituents are not reasonably expected to be in or derived from the waste contained in the facility. The administrator may also specify an appropriate alternate frequency for the collection of the additional independent samples under paragraph (b)(i)(E)(II) of this section, considering the following factors:

(1.) Lithology of the aquifer and unsaturated zone;

(2.) Hydraulic conductivity of the aquifer and unsaturated zone;

(3.) Groundwater flow rates;

(4.) Minimum distance between the facility and the downgradient monitor well(s);

(5.) Classification of the aquifer under Chapter 8 of the Water Quality Rules and Regulations; and

(6.) Nature (fate and transport) of any constituents detected under assessment monitoring.

(IV) After obtaining the results from any sampling event under paragraph (b)(i)(E)(II) of this section, the owner or operator must:

(1.) Within fourteen (14) days, notify the administrator and place a notice in the operating record identifying the Appendix B constituents that have been detected;

(2.) Within ninety (90) days, and on at least a semiannual basis thereafter, resample all wells, conduct analyses for all constituents required under detection monitoring [paragraph (b)(i)(D) of this section], and for all Appendix B constituents which have been detected under assessment monitoring [paragraph (b)(i)(E)(II) of this section], and record their concentrations in the operating record. At least one (1) sample must be collected from each well during each sampling event under this paragraph. The administrator may approve an alternate sampling frequency, no less than annual, considering the factors in paragraph (b)(i)(E)(III) of this section;

(3.) Establish background concentrations for any constituents detected pursuant to paragraph (b)(i)(E)(II) or (b)(i)(E)(IV)(2.) of this section; and

(4.) Request the administrator to establish groundwater protection standards for all constituents detected pursuant to paragraph (b)(i)(E)(II) or (b)(i)(E)(IV)(2.) of this section. The groundwater protection standards shall be established in accordance with paragraphs (b)(i)(E)(VIII) or (b)(i)(E)(IX) of this

section.

(V) If the concentrations of all Appendix B constituents are at or below background values using the approved statistical procedures, for two (2) consecutive sampling events, the owner or operator must notify the administrator and may return to detection monitoring under paragraph (b)(i)(D) of this section.

(VI) If the concentrations of any Appendix B constituents are above background values, but all concentrations are below the groundwater protection standard established under paragraphs (b)(i)(E)(VIII) or (b)(i)(E)(IX) of this section, using the approved statistical procedures, the owner or operator must continue assessment monitoring under paragraph (b)(i)(E) of this section.

(VII) If one (1) or more Appendix B constituents are detected at statistically significant levels above the groundwater protection standard established under paragraphs (b)(i)(E)(VIII) or (b)(i)(E)(IX) of this section in any sampling event, the owner or operator must, within fourteen (14) days of this finding place a notice in the operating record identifying the Appendix B constituents, notify the administrator and all appropriate local government officials, and:

(1.) Characterize the nature and extent of the release by installing additional monitor wells as necessary;

(2.) Install at least one (1) additional monitor well at the facility boundary downgradient of the release and sample the well in accord with paragraph (b)(i)(E)(IV)(2.) of this section;

(3.) Notify all persons who own or reside on the land that directly overlies any part of the plume of contamination, if that plume has migrated off-site; and

(4.) Initiate an assessment of corrective measures as required by Section 8(a) of this

chapter within ninety (90) days; or

(5.) Demonstrate to the administrator that the contamination was caused by another source, resulted from an error in sampling, analysis or statistical evaluation, or from natural variation in groundwater quality. If a successful demonstration is made, the owner or operator must continue monitoring under the assessment monitoring program as required by paragraph (b)(i)(E) of this section, or may return to detection monitoring if all Appendix B constituents are at or below background as specified in paragraph (b)(i)(E)(V) of this section. Until a successful demonstration is made, the owner or operator must comply with paragraph (b)(i)(E)(VII) of this section including initiating an assessment of corrective measures under Section 8(b) of this chapter.

(VIII) The owner or operator must request that the administrator establish a groundwater protection standard for each Appendix B constituent detected in the groundwater. The administrator shall establish groundwater protection standards, which shall be:

(1.) For constituents where a maximum contaminant level (MCL) has been promulgated, the MCL for that constituent;

(2.) For constituents for which MCL's have not been promulgated, the background concentration established from wells in accordance with paragraph (b)(i)(B)(I); or

(3.) For constituents for which the background level is higher than the MCL or health-based levels identified under paragraph (b)(i)(E)(IX) of this section, the background concentration.

(IX) The administrator may establish an alternative groundwater protection standard for constituents for which MCL's have not been established. These groundwater protection standards shall be health-based levels meeting the requirements of Chapter 8 of the

Water Quality Rules and Regulations.

(ii) Type II landfills, and any Type I landfill excluded from groundwater monitoring requirements under paragraph (b)(i)(A)(VI) of this section, shall, if required by the administrator, comply with the following groundwater monitoring and corrective action requirements:

(A) Well placement: All facilities required to install monitoring wells shall place them in accordance with the department's requirements. Following initial placement of the wells, the operator shall confirm that the wells are capable of measuring groundwater quality that is representative of conditions hydraulically upgradient and downgradient of the solid waste disposal facility.

(B) Well design, construction/installation and abandonment: All wells shall be designed, constructed and installed in accordance with the Water Quality Division Chapter 11 requirements. All abandoned monitoring wells shall be plugged and sealed in accordance with the Water Quality Division Chapter 11 requirements.

(C) Permits required: Prior to well installation, the monitoring well design, construction and location specifications shall be approved by the administrator. A construction permit under Chapter 3 of the Water Quality Division rules and regulations is not required. All monitoring wells shall be permitted by the Wyoming State Engineer's Office.

(D) Analyses:

(I) Baseline monitoring: The initial samples acquired in a monitoring program shall be analyzed for pH, Total Dissolved Solids (T.S.), Chemical Oxygen Demand (COD), Total Organic Carbon (TO), Ammonia as N, Nitrate as N, Bicarbonate, Carbonate, Chloride, Fluoride, Calcium, Magnesium, Potassium, Sodium, Sulfate, Copper, Iron, Manganese, Nickel, Zinc, Arsenic, Barium, Cadmium, Chromium, Cyanide, Lead, Mercury, Selenium, and Silver. Water temperature, specific conductance, pH, and static water level measurements shall also be taken in the field

during each monitoring event. The length of this initial monitoring period shall not exceed one (1) year; samples acquired during this period shall be taken at least quarterly.

(II) Detection monitoring: Following the baseline monitoring period, the administrator may specify a reduced set of sampling parameters to be analyzed at least semi-annually. The reduced set of parameters shall include, at a minimum: Total Dissolved Solids (T.S.), Chlorides, Ammonia (as N), Iron, Hardness, and Total Organic Carbon (TO). Water temperature, specific conductance, pH, and static water level measurements shall also be taken in the field during each monitoring event.

(III) Assessment monitoring: Should groundwater monitoring data indicate that the facility is impacting groundwater quality, additional wells, a revised set of sampling parameters and revised sampling schedule may be required by the administrator to define the nature and extent of contamination.

(IV) The administrator may specify additional water quality parameters for analyses, including organic chemical constituents, based on its review of the wastes likely to be disposed at any specific solid waste disposal facility.

(E) Corrective actions: Whenever there is a release of contamination which adversely impacts groundwater quality, the operator shall institute corrective actions approved by the administrator, as specified in Section 8 of this chapter.

iii Groundwater monitoring data shall be provided to the administrator as follows:

(A) Operators of all facilities shall submit paper copies of all groundwater monitoring data;

(B) Operators of Type I facilities shall also submit groundwater monitoring data on magnetic media or electronically transmitted files in a format specified

by the administrator;

(C) Operators of Type II facilities with three (3) or more groundwater monitoring wells may also be required to submit groundwater monitoring data on magnetic media or electronically transmitted files in a format specified by the administrator.

(c) Methane:

(i) Methane probe system design: Methane probe design, construction, installation and location shall be adequate to monitor compliance with the standards specified in Chapter 2, Sections 4 and 5.

(ii) Abandonment of methane probe boreholes: Abandoned methane probe boreholes shall be plugged and sealed in accordance with department recommendations.

(iii) Analyses: Methane analyses shall be conducted at least quarterly. Analyses shall be conducted using a gas-scope and/or organic vapor analyzer, using the manufacturer's recommended procedures.

(d) Air monitoring: Air monitoring, if required, shall be conducted in accord with Air Quality Division regulations.

(e) Soil core monitoring: Soil core monitoring, if required, shall be conducted in accord with a plan approved by the administrator.

(f) Vadose zone monitoring: Vadose zone monitoring, if required, shall be conducted in accord with a plan approved by the administrator.

(g) Reporting of environmental monitoring data: On an annual basis, operators of all facilities shall provide the administrator with copies of all required environmental monitoring data. An analysis of environmental monitoring data shall also be submitted as follows:

(i) Operators of Type I facilities shall provide copies of all required statistical analyses;

(ii) Operators of all facilities may be required to submit supporting charts and/or maps which represent the data.

Section 7. Closure and Post-Closure Standards. All facilities shall be closed in accordance with the standards described in this section, as well as the requirements of Chapter 1, Sections 2(g) and 2(h).

(a) Commencement of closure: Closure activities as specified in this section and in the approved facility closure plan shall commence no later than thirty (30) days following the time the facility ceases to receive solid wastes and shall be completed within one hundred eighty (180) days following commencement of closure. The administrator may approve:

(i) Delayed closure of a facility if the facility has additional remaining disposal capacity, and the owner demonstrates that there will be no threats to human health or the environment from the unclosed facility, and

(ii) Extensions of the closure period if needed to adequately complete closure activities and the owner demonstrates that there will be no threats to human health or the environment from the unclosed facility.

(b) Notification of closure: Prior to the commencement of closure activities, a notice of closure shall be published in an area newspaper and posted at all facility access points.

(c) Prevention of erosion or ponding problems: Facilities shall be engineered to inhibit future problems with erosion or ponding of surface water over filled areas. This may be done via site grading and revegetation, placement of rip rap or other appropriate means.

(d) Final cover: At closure, an infiltration

barrier layer of subsoil, or a combination of materials as specified in the permit, a minimum of two (2) feet thick shall be constructed over the refuse or any intermediate cover already in place. This infiltration barrier layer shall be covered with a minimum of six (6) inches of topsoil and graded to prevent erosion or surface water ponding. The infiltration barrier layer shall meet the following minimum specifications:

(i) The infiltration barrier layer in the final cover of a Type I or Type II ~~sanitary~~municipal solid waste landfill that ceased receipt of wastes before October 9, 1991 shall minimize the amount of moisture which infiltrates the final cover system. The administrator may specify more stringent specifications if the administrator determines that the site poses a significant threat to public health or the environment.

(ii) The infiltration barrier layer in the final cover for a Type I or Type II ~~sanitary~~municipal solid waste landfill that receives wastes on or after October 9, 1991 shall have a minimum permeability less than or equal to the permeability of the bottom liner or natural subsoils, or a permeability of 1 x 10E-5 cm/sec (10 ft/yr), whichever is less, or such lower value as specified in the facility permit. The administrator may approve alternative infiltration barrier layer designs which achieve an equivalent reduction in the annual flux of infiltration through the final cover system. The administrator may require monitoring of alternative infiltration barrier layer designs to demonstrate the performance of the designs.

(e) Revegetation: At closure, any portion of the facility that has been disturbed by solid waste disposal activities shall be revegetated to minimize wind and water erosion of the final cover, consistent with the post-closure land use. Vegetation shall be a diverse mix selected to be compatible with the climatic conditions, require little maintenance, and have root depths that will not exceed the depth of the final cover.

(f) Surveyed corners: At closure, all facility boundary corners shall be surveyed and marked with

permanent survey caps.

(g) Notice on deed: At closure, an instrument which clearly gives notice of the restrictions that apply to future activities on the disposal facility property shall be filed for recording by the registrar of deeds (county clerk) in the county where the facility is located. Wording of such an instrument shall indicate that the property has been used as a solid waste disposal facility. This shall be recorded prior to any property transaction resulting in another use for the property. The owner/operator, or its successors, shall assure that post-closure use of the property will be restricted to prevent any disturbance to the facility's containment system including caps and liners, or the functioning of the facility's monitoring system.

(h) Access control: Facility fences, gates and any other access restrictions shall be maintained until the site has been satisfactorily closed and revegetated, if post-closure land use requires establishment of vegetative cover.

(i) Waste containment systems: Waste containment systems, including but not limited to liners, leachate detection, collection and management systems and final cover systems shall be maintained throughout the closure and post-closure periods.

(j) Surface water structures: Surface water structures shall be maintained and operated throughout the closure and post-closure periods.

(k) Environmental monitoring systems: Environmental monitoring systems shall be maintained and operated throughout the closure and post-closure periods.

(l) Corrective action systems: The operator shall respond to any pollution problem reasonably related to the facility's activities. Corrective action systems shall be maintained and operated throughout the closure and post-closure periods.

(m) Special waste management standards: Any

facility used for the management of a special waste regulated under Chapter 8, Special Waste Management Standards, shall also comply with the applicable closure standards established under Chapter 8.

(n) Transfer, treatment and storage facility standards: Any facility used for the transfer, treatment or storage of solid wastes shall also comply with the applicable closure standards established under Chapter 6.

(o) Certification of closure: Completion of closure activities shall be certified by a Wyoming registered professional engineer, as required by Section 2(h)(ii) of Chapter 1.

(p) Post-closure land use: Each facility shall be returned to the post-closure land use specified in the permit, unless an alternative use is approved by the administrator.

(q) Post-closure period:

(i) The post-closure period for Type I ~~sanitary~~municipal solid waste landfills which continued to receive wastes on or after October 9, 1993 and Type II ~~sanitary~~municipal solid waste landfills which continue to receive wastes on or after October 9, 1997 shall extend for a period of not less than thirty (30) years after certification of closure activities is approved by the administrator. The minimum post-closure period may be terminated by the administrator at an earlier date if the administrator determines that the facility has been adequately stabilized and that the environmental monitoring or control systems have demonstrated that the facility closure is protective of public health and the environment consistent with the purposes of the act.

(ii) The post-closure period for Type I ~~sanitary~~municipal solid waste landfills which received waste after October 9, 1991 but ceased receipt of wastes before October 9, 1993 and installed an approved final cover system by October 9, 1994 shall extend for a period of not less than five (5) years after certification of closure activities is approved by the administrator.

(iii) The post-closure period for Type II ~~sanitary~~municipal solid waste landfills which received waste after October 9, 1991 but ceased receipt of wastes before October 9, 1997 and installed an approved final cover system by October 9, 1998 shall extend for a period of not less than five (5) years after certification of closure activities is approved by the administrator.

(iv) The post-closure period for Type I ~~sanitary~~municipal solid waste landfills which received waste after October 9, 1991 and ceased receipt of wastes before October 9, 1993 but did not install an approved final cover system by October 9, 1994 shall extend for a period of not less than thirty (30) years after certification of closure activities is approved by the administrator. The minimum post-closure period may be terminated by the administrator at an earlier date if the administrator determines that the facility has been adequately stabilized and that the environmental monitoring or control systems have demonstrated that the facility closure is protective of public health and the environment consistent with the purposes of the act.

(v) The post-closure period for Type II ~~sanitary~~municipal solid waste landfills which received waste after October 9, 1991 and ceased receipt of wastes before October 9, 1997 but did not install an approved final cover system by October 9, 1998 shall extend for a period of not less than thirty (30) years after certification of closure activities is approved by the administrator. The minimum post-closure period may be terminated by the administrator at an earlier date if the administrator determines that the facility has been adequately stabilized and that the environmental monitoring or control systems have demonstrated that the facility closure is protective of public health and the environment consistent with the purposes of the act.

(vi) The post-closure period for Type I and Type II ~~sanitary~~municipal solid waste landfills which ceased receipt of wastes before October 9, 1991 shall extend for a period of not less than five (5) years after certification of closure activities is approved by the

administrator.

(vii) Following the initial minimum post-closure period specified in this subsection, the post-closure period shall be automatically extended until such time when the administrator determines, upon petition by the operator accompanied by submission of relevant information, that the facility has been adequately stabilized in a manner protective of human health and the environment.

(viii) Petitions to terminate the post-closure period shall include certification from a Wyoming registered professional engineer that post-closure care has been completed in compliance with the post-closure plan and in a manner protective of human health and the environment.

Section 8. Standards For Corrective Action:

(a) Assessment of corrective measures: All facilities required to start a corrective measures assessment under paragraph (b)(i)(E)(VII) or (b)(ii)(E) of Section 6 of this chapter shall initiate assessment of corrective measures within ninety (90) days of a groundwater quality exceedance as described at Section 6(b)(i)(E)(VII) of this chapter and complete the assessment in a reasonable time, determined by the administrator. The owner or operator shall:

(i) Continue to conduct an assessment monitoring program under paragraph (b)(i)(E) or (b)(ii)(D)(II) of Section 6 of this chapter, as applicable;

(ii) Analyze the effectiveness of potential corrective measures to meet any alternate remedies which are being considered under paragraph (b) of this section, considering:

(A) The performance, reliability, ease of implementation, and potential impacts of appropriate alternate remedies, including safety impacts, cross-media impacts, and control of exposure to any residual

contamination;

(B) The time required to begin and complete the remedy;

(C) The costs of remedy implementation; and

(D) The institutional requirements such as state or local permits or other environmental or public health requirements that may substantially affect implementation of the remedy.

(iii) Provide an opportunity for public review of the corrective measures assessment, prior to selection of the remedy.

(b) Selection of remedy:

(i) The landfill operator must demonstrate to the administrator how the selected corrective action remedy meets the remedy standards established in this subsection. The administrator must approve the selected remedy and the remedial activities schedule before it is implemented.

(ii) The selected remedy must:

(A) Be protective of human health and the environment;

(B) Attain the groundwater protection standard;

(C) Control the source of releases of pollution so as to reduce or eliminate, to the maximum extent practicable, further releases of Appendix B constituents into the environment that may pose a threat to human health or the environment; and

(D) Comply with standards for management of wastes specified in this chapter.

(iii) The selection of the corrective action

remedy must consider the following factors:

(A) Short- and long-term effectiveness of the remedy, and the degree of certainty that the remedy will be effective, considering:

(I) Magnitude of reduction of existing risk to public health and the environment;

(II) Magnitude of risk of further releases of pollution;

(III) Type and degree of long-term management required, including monitoring, operation, and maintenance;

(IV) Short-term risks of exposure to the community, workers, or the environment during any excavation, transportation and redisposal of wastes;

(V) Time until full protection is achieved;

(VI) Potential for exposure to humans and the environment from remaining wastes;

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

(VIII) Potential need for replacement of the remedy.

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

(I) The extent to which containment will reduce further releases; and

(II) The extent to which treatment technologies will be used.

(C) The ease or difficulty of implementing the potential remedy, considering:

(I) Difficulty in constructing the technology;

(II) Expected reliability of the technology;

(III) Availability of necessary equipment and specialists; and

(IV) Available capacity of needed treatment, storage, and disposal facilities.

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

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

(iv) The administrator shall specify a schedule for initiating and completing remedial activities, considering the following factors:

(A) Extent and nature of contamination;

(B) Practical capabilities of remedial technologies in achieving compliance with groundwater protection standards;

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

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

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

(F) Classification of the aquifer under

Chapter 8 of the Water Quality Rules and Regulations, plus a consideration of the following factors:

(I) Current and future uses;

(II) Proximity and withdrawal rate of users;

(III) Groundwater quantity;

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

(V) The hydrologic characteristics of the facility and surrounding lands;

(VI) Groundwater removal and treatment costs; and

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

(G) Practicable capability of the owner or operator; and

(H) Any other factor considered relevant by the administrator.

(v) The administrator may determine that remediation of a release of an Appendix B constituent from a facility is not necessary if the owner or operator demonstrates to the satisfaction of the administrator that:

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

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

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

(II) Is not hydraulically connected with waters to which the hazardous constituents are migrating or are likely to migrate in a concentration(s) that would exceed the groundwater protection standards established under Section 6 of this chapter; or

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

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

(vi) A determination by the administrator not to require remediation under paragraph (v) of this section shall not affect the authority of the administrator to require the owner or operator to undertake source control measures or other measures that may be necessary to eliminate or minimize further releases to the groundwater, to prevent exposure to the groundwater, or to remediate the groundwater to concentrations that are technically practicable and significantly reduce threats to human health or the environment.

(c) Corrective action implementation:

(i) The operator must:

(A) Implement the selected remedy as approved by the administrator;

(B) Continue groundwater monitoring to meet the requirements of the assessment monitoring program and to demonstrate the effectiveness of the selected remedy in meeting established water quality standards; and

(C) Take interim measures as determined necessary by the administrator to ensure protection of public health and the environment. The administrator shall consider the following factors in determining the need for interim measures:

(I) Time required to develop and implement a final remedy;

(II) Actual or potential exposure of nearby populations or environmental receptors to hazardous constituents;

(III) Actual or potential contamination of drinking water supplies or sensitive ecosystems;

(IV) Further degradation of the groundwater that may occur if remedial action is not initiated expeditiously;

(V) Weather conditions that may cause hazardous constituents to migrate or be released;

(VI) Risks of fire or explosion, or potential for exposure to hazardous constituents as a result of an accident or failure of a container or handling system; and

(VII) Other situations that may pose threats to human health and the environment.

(ii) If the selected remedy is not meeting the corrective action standards, the owner or operator shall implement other methods or techniques which have been approved by the administrator that could practicably achieve compliance with the requirements, unless there is no practicable alternative and the owner or operator meets the requirements of paragraph (c)(iii) of this section.

(iii) If a selected remedy cannot be practically achieved with any currently available methods, the owner or operator must:

(A) Demonstrate to the satisfaction of the administrator that the remedy cannot be achieved;

(B) Implement alternative measures which have been approved by the administrator to control

exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment; and

(C) Implement alternate measures for control of the sources of contamination, which are consistent with the overall objective of the remedy and which are technically practicable.

(iv) All solid wastes managed pursuant to a remedy or interim measure under this section shall be managed in a manner that complies with the requirements of this chapter and that is protective of human health and the environment.

(v) Remedies shall be considered complete when:

(A) The owner or operator complies with the groundwater protection standards established under Section 6(b)(i)(E)(VIII) or (IX), at all points within the plume of contamination that lie beyond the groundwater monitoring well system established under Section 6(b)(i)(B);

(B) Compliance with the groundwater protection standards shall be considered complete when concentrations of Appendix B constituents have not exceeded the groundwater protection standard(s) for a period of three (3) consecutive years using the approved statistical procedures. The administrator may approve an alternate length of time during which the owner or operator must demonstrate compliance with the standard(s), considering:

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

(II) Behavior characteristics of the hazardous constituents in the groundwater;

(III) Accuracy of the data; and

(IV) Characteristics of the groundwater; and

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

(vi) When the corrective action remedy is complete, the operator must:

(A) Place a notice in the facility operating record; and

(B) Petition the administrator to be released from the financial assurance requirements for corrective action under Chapter 7 of these rules and regulations.

Appendix A - Constituents for Detection Monitoring[1]

Common name[2]	CAS RN[3]	Chemical abstracts service index name[4]	Suggested methods[5]	PQL (μg/L)[6]
Inorganics (15)				
Antimony	(Total)	Antimony	6010 7040 7041	300 2000 30
Arsenic	(Total)	Arsenic	6010 7060 7061	500 10 20
Barium	(Total)	Barium	6010 7080	20 1000
Beryllium	(Total)	Beryllium	6010 7090 7091	3 50 2
Cadmium	(Total)	Cadmium	6010 7130 7131	40 50 1
Chromium	(Total)	Chromium	6010 7190 7191	70 500 10
Cobalt	(Total)	Cobalt	6010 7200 7201	70 500 10
Copper	(Total)	Copper	6010 7210 7211	60 200 10
Lead	(Total)	Lead	6010 7420 7421	400 1000 10
Nickel	(Total)	Nickel	6010 7520	150 400
Selenium	(Total)	Selenium	6010 7740 7741	750 20 20
Silver	(Total)	Silver	6010 7760	70 100
Thallium	(Total)	Thallium	6010 7840 7841	400 1000 10
Vanadium	(Total)	Vanadium	6010 7910 7911	80 2000 40
Zinc	(Total)	Zinc	6010 7950 7951	20 50 0.5
Volatiles (47)				
Acetone	67-64-1	2-Propanone	8260	100

Acrylonitrile	107-13-1	2-Propenenitrile	8030 8260	5 200
Benzene	71-43-2	Benzene	8020 8021 8260	2 0.1 5
Bromochloromethane; Chlorobromomethane	74-97-5	Methane, bromochloro-	8021 8260	0.1 5
Bromodichloromethane; Dibromochloromethane	75-27-4	Methane, bromodichloro-	8010 8021 8260	1 0.2 5
Bromoform; Tribromomethane	75-25-2	Methane, tribromo-	8010 8021 8260	2 15 5
Carbon disulfide	75-15-0	Carbon disulfide	8260	100
Carbon tetrachloride	56-23-5	Methane, tetrachloro-	8010 8021 8260	1 0.1 10
Chlorobenzene	108-90-7	Benzene, chloro-	8010 8020 8021 8260	2 2 0.1 5
Chloroethane; Ethyl chloride	75-00-3	Ethane, chloro-	8010 8021 8060	5 1 10
Chloroform; Trichloromethane	67-66-3	Methane, trichloro-	8010 8021 8260	0.5 0.2 5
Dibromochloromethane; Chlorodibromomethane	124-48-1	Methane, dibromochloro-	8010 8021 8260	1 0.3 5
1,2-Dibromo-3-chloropropane; DBCP	96-12-8	Propane, 1,2-dibromo-3-chloro-	8011 8021 8260	0.1 30 25
1,2-Dibromoethane; Ethylene dibromide; EDB	106-93-4	Ethane, 1,2-dibromo-	8011 8021	0.1 10
o-Dichlorobenzene	95-50-1	Benzene, 1,2-dichloro-	8010 8020 8021 8120 8260 8270	2 5 0.5 10 5 10
p-Dichlorobenzene; 1,4 Dichlorobenzene	106-46-7	Benzene, 1,4-dichloro-	8010	2
trans-1,4-Dichloro-2-butene	110-57-6	2-Butene, 1,4-dichloro-, (E)-	8260	100
1,1-Dichloroethane; Ethylidene chloride	75-34-3	Ethane, 1,1-dichloro-	8010 8021 8260	1 0.5 5
1,2-Dichloroethane; Ethylene dichloride	107-06-2	Ethane, 1,1-dichloro-	8010 8021 8260	0.5 0.3 5
1,1-Dichloroethylene; 1,1-Dichlorothene; Vinylidene chloride	75-35-4	Ethene, 1,1-dichloro-	8010 8021 8260	1 0.5 5
cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2	Ethene, 1,2-dichloro-, (Z)-	8021 8260	0.2 5
trans-1,2-Dichloroethylene trans-1,2-Dichloroethene	156-60-5	Ethene, 1,2-dichloro-, (E)-	8010 8021 8260	1 0.5 5
1,2-Dichloropropane;	78-87-5	Propane, 1,2-dichloro-	8010	0.5

Propylene dichloride			8021 8260	0.05 5
cis-1,3-Dichloropropene	10061-01-5	1-Propene, 1,3-dichloro-, (Z)-	8010 8260	20 10
trans-1,3-Dichloropropene	10061-02-6	1-Propene, 1,3-dichloro-, (E)-	8010 8260	5 5
Ethylbenzene	100-41-4	Benzene, ethyl-	8020 8221 8260	2 0.05 5
2-Hexanone; Methyl butyl ketone	591-78-6	2-Hexanone	8260	50
Methyl bromide; Bromomethane	74-83-9	Methane, bromo-	8010 8021	20 10
Methyl chloride; Chloromethane	74-87-3	Methane, chloro-	8010 8021	1 0.3
Methylene bromide; Dibromomethane	74-95-3	Methane, dibromo-	8010 8021 8260	15 20 10
Methylene chloride; Dichloromethane	75-09-2	Methane, dichloro-	8010 8021 8260	5 0.2 10
Methyl ethyl ketone; MEK; 2-Butanone	78-93-3	2-Butanone	8015 8260	10 100
Methyl iodide; Iodomethane	74-88-4	Methane, iodo-	8010 8260	40 10
4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1	2-Pentanone, 4-methyl-	8015 8260	5 100
Styrene	100-42-5	Benzene, ethenyl-	8020 8021 8260	1 0.1 10
1,1,1,2-Tetrachloroethane	630-20-6	Ethane, 1,1,1,2-tetrachloro-	8010 8021 8260	5 0.05 5
1,1,2,2-Tetrachloroethane	79-34-5	Ethane, 1,1,2,2-tetrachloro-	8010 8021 8260	0.5 0.1 5
Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4	Ethene, tetrachloro-	8010 8021 8260	0.5 0.5 5
Toluene	108-88-3	Benzene, methyl-	8020 8021 8260	2 0.1 5
1,1,1-Trichloroethane; Methylchloroform	71-55-6	Ethane, 1,1,1-trichloro-	8010 8021 8260	0.3 0.3 5
1,1,2-Trichloroethane	79-00-5	Ethane, 1,1,2-trichloro-	8010 8260	0.2 5
Trichloroethylene; Trichloroethene	79-01-6	Ethene, trichloro-	8010 8021 8260	1 0.2 5
Trichlorofluoromethane; CFC-11	75-69-4	Methane, trichlorofluoro-	8010 8021 8260	10 0.3 5
1,2,3-Trichloropropane	96-18-4	Propane, 1,2,3-trichloro-	8010 8021 8260	10 5 15

Vinyl acetate	**108-05-4**	**Acetic acid, ethenyl ester**	**8260**	**50**
Vinyl chloride; Chloroethene	**75-01-4**	**Ethene, chloro-**	**8010 8021 8260**	**2 0.4 10**
Xylene (total)	**See Note 11**	**Benzene, dimethyl-**	**8020 8021 8260**	**5 0.2 5**

[1]The regulatory requirements pertain only to the list of substances; the right hand columns (Methods and PQL) are given for informational purposes only. See also footnotes 5 and 6.

[2]Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

[3]Chemical Abstracts Service registry number. Where "Total" is entered, all species in the groundwater that contain this element are included.

[4]CAS index names are those used in the 9th Collective Index.

[5]Suggested Methods refer to analytical procedure numbers used in EPA Report SW-846 "Test Methods for Evaluating Solid Waste", third edition, November 1986, as revised, December 1987. Analytical details can be found in SW-846 and in documentation on file at the department. CAUTION: The methods listed are representative SW-846 procedures and may not always be the most suitable method(s) for monitoring an analyte under the regulations.

[6]Practical Quantitation Limits (PQLs) are the lowest concentrations of analytes in groundwaters that can be reliably determined within specified limits of precision and accuracy by the indicated methods under routine laboratory operating conditions. The PQLs listed are generally stated to one significant figure. PQLs are based on 5 mL samples for volatile organics and 1 L samples for semivolatile organics. CAUTION: The PQL values in many cases are based only on a general estimate for the method and not on a determination for individual compounds; PQLs are not a part of the regulation.

Appendix B - Constituents for Assessment Monitoring[1]

Common name[2]	CAS RN[3] 10061-02-6	Chemical abstracts service index name[4]	Suggested methods[5]	PQL (μg/L)[6]
Inorganics (19)				
Antimony	(Total)	Antimony	6010 7040 7041	300 2000 30
Arsenic	(Total)	Arsenic	6010 7060 7061	500 10 20
Barium	(Total)	Barium	6010 7080	20 1000
Beryllium	(Total)	Beryllium	6010 7090 7091	3 50 2
Cadmium	(Total)	Cadmium	6010 7130 7131	40 50 1
Chromium	(Total)	Chromium	6010 7190 7191	70 500 10
Cobalt	(Total)	Cobalt	6010 7200 7201	70 500 10
Copper	(Total)	Copper	6010 7210 7211	60 200 10
Cyanide	57-12-5	Cyanide	9010	200
Lead	(Total)	Lead	6010 7420 7421	400 1000 10
Mercury	(Total)	Mercury	7470	2
Nickel	(Total)	Nickel	6010 7520	150 400
Selenium	(Total)	Selenium	6010 7740 7741	750 20 20
Silver	(Total)	Silver	6010 7760	70 100
Sulfide	18496-25-8	Sulfide	9030	4000
Thallium	(Total)	Thallium	6010 7840 7841	400 1000 10
Tin	(Total)	Tin	6010	40
Vanadium	(Total)	Vanadium	6010 7910 7911	80 2000 40
Zinc	(Total)	Zinc	6010 7950 7951	20 50 0.5

Volatiles (64)

Acetone	67-64-1	2-Propanone	8260	100
Acetonitrile; Methyl cyanide	75-05-8	Acetonitrile	8015	100
Acrolein	107-02-8	2-Propenal	8030 8260	5 100
Acrylonitrile	107-13-1	2-Propenenitrile	8030 8260	5 200
Allyl chloride	107-05-1	1-Propene, 3-chloro-	8010 8260	5 10
Benzene	71-43-2	Benzene	8020 8021 8260	2 0.1 5
Bromochloromethane; Chlorobromomethane	74-97-5	Methane, bromochloro-	8021 8260	0.1 5
Bromodichloromethane; Dibromochloromethane	75-27-4	Methane, bromodichloro-	8010 8021 8260	1 0.2 5
Bromoform; Tribromomethane	75-25-2	Methane, tribromo-	8010 8021 8260	2 15 5
Carbon disulfide	75-15-0	Carbon disulfide	8260	100
Carbon tetrachloride	56-23-5	Methane, tetrachloro-	8010 8021 8260	1 0.1 10
Chlorobenzene	108-90-7	Benzene, chloro-	8010 8020 8021 8260	2 2 0.1 5
Chloroethane; Ethyl chloride	75-00-3	Ethane, chloro-	8010 8021 8060	5 1 10
Chloroform; Trichloromethane	67-66-3	Methane, trichloro-	8010 8021 8260	0.5 0.2 5
Chloroprene	126-99-8	1,3-Butadiene, 2-chloro-	8010 8260	50 20
Dibromochloromethane; Chlorodibromomethane	124-48-1	Methane, dibromochloro-	8010 8021 8260	1 0.3 5
1,2-Dibromo-3-chloropropane; DBCP	96-12-8	Propane, 1,2-dibromo-3-chloro-	8011 8021 8260	0.1 30 25
1,2-Dibromoethane; Ethylene dibromide; EDB	106-93-4	Ethane, 1,2-dibromo-	8011 8021	0.1 10
o-Dichlorobenzene	95-50-1	Benzene, 1,2-dichloro-	8010 8020 8021 8120 8260 8270	2 5 0.5 10 5 10
m-Dichlorobenzene; 1,3-Dichlorobenzene	541-73-1	Benzene, 1,3-dichloro-	8010 8020 8021 8120 8260 8270	5 5 0.2 10 5 10

p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7	Benzene, 1,4-dichloro-	8020 8021 8120 8260 8270	5 0.2 10 5 10
p-Dichlorobenzene; 1,4 Dichlorobenzene	106-46-7	Benzene, 1,4-dichloro-	8010	2
trans-1,4-Dichloro-2-butene	110-57-6	2-Butene, 1,4-dichloro-, (E)-	8260	100
Dichlorodifluoromethane	75-71-8	Methane, dichlorodifluoro-	8021 8260	0.5 5
1,1-Dichloroethane; Ethylidene chloride	75-34-3	Ethane, 1,1-dichloro-	8010 8021 8260	1 0.5 5
1,2-Dichloroethane; Ethylene dichloride	107-06-2	Ethane, 1,1-dichloro-	8010 8021 8260	0.5 0.3 5
1,1-Dichloroethylene; 1,1-Dichlorothene; Vinylidene chloride	75-35-4	Ethene, 1,1-dichloro-	8010 8021 8260	1 0.5 5
cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2	Ethene, 1,2-dichloro-, (Z)-	8021 8260	0.2 5
trans-1,2-Dichloroethylene trans-1,2-Dichloroethene	156-60-5	Ethene, 1,2-dichloro-, (E)-	8010 8021 8260	1 0.5 5
1,2-Dichloropropane; Propylene dichloride	78-87-5	Propane, 1,2-dichloro-	8010 8021 8260	0.5 0.05 5
1,3-Dichloropropane; Trimethylene dichloride	142-28-9	Propane, 1,3-dichloro-	8021 8260	0.3 15
2,2-Dichloropropane; Isopropylidene chloride	594-20-7	Propane, 2,2-dichloro-	8021 8260	0.5 5
1,1-Dichloropropene;	563-58-6	1-Propene, 1,1-dichloro-	8021 8260	0.2 5
cis-1,3-Dichloropropene	10061-01-5	1-Propene, 1,3-dichloro-, (Z)-	8010 8260	20 10
trans-1,3-Dichloropropene	10061-02-6	1-Propene, 1,3-dichloro-, (E)-	8010 8260	5 5
Ethylbenzene	100-41-4	Benzene, ethyl-	8020 8221 8260	2 0.05 5
Ethyl methacrylate	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester	8015 8260 8270	5 10 10
2-Hexanone; Methyl butyl ketone	591-78-6	2-Hexanone	8260	50
Isobutyl alcohol	78-83-1	1-Propanol, 2-methyl-	8015 8240	50 100
Methacrylonitrile	126-98-7	2-Propenenitrile, 2-methyl-	8015 8260	5 100
Methyl bromide; Bromomethane	74-83-9	Methane, bromo-	8010 8021	20 10
Methyl chloride; Chloromethane	74-87-3	Methane, chloro-	8010 8021	1 0.3
Methylene bromide; Dibromomethane	74-95-3	Methane, dibromo-	8010 8021 8260	15 20 10

Methylene chloride; Dichloromethane	75-09-2	Methane, dichloro-	8010 8021 8260	5 0.2 10
Methyl ethyl ketone; MEK; 2-Butanone	78-93-3	2-Butanone	8015 8260	10 100
Methyl iodide; Iodomethane	74-88-4	Methane, iodo-	8010 8260	40 10
Methyl methacrylate	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester	8015 8260	2 30
4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1	2-Pentanone, 4-methyl-	8015 8260	5 100
Naphthalene	91-20-3	Naphthalene	8021 8100 8260 8270	0.5 200 5 10
Propionitrile; Ethyl cyanide	107-12-0	Propanenitrile	8015 8260	60 150
Styrene	100-42-5	Benzene, ethenyl-	8020 8021 8260	1 0.1 10
1,1,1,2-Tetrachloroethane	630-20-6	Ethane, 1,1,1,2-tetrachloro-	8010 8021 8260	5 0.05 5
1,1,2,2-Tetrachloroethane	79-34-5	Ethane, 1,1,2,2-tetrachloro-	8010 8021 8260	0.5 0.1 5
Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4	Ethene, tetrachloro-	8010 8021 8260	0.5 0.5 5
Toluene	108-88-3	Benzene, methyl-	8020 8021 8260	2 0.1 5
1,2,4-Trichlorobenzene	120-82-1	Benzene, 1,2,4-trichloro-	8021 8120 8260 8270	0.3 0.5 10 10
1,1,1-Trichloroethane; Methylchloroform	71-55-6	Ethane, 1,1,1-trichloro-	8010 8021 8260	0.3 0.3 5
1,1,2-Trichloroethane	79-00-5	Ethane, 1,1,2-trichloro-	8010 8260	0.2 5
Trichloroethylene; Trichloroethene	79-01-6	Ethene, trichloro-	8010 8021 8260	1 0.2 5
Trichlorofluoromethane; CFC-11	75-69-4	Methane, trichlorofluoro-	8010 8021 8260	10 0.3 5
1,2,3-Trichloropropane	96-18-4	Propane, 1,2,3-trichloro-	8010 8021 8260	10 5 15
Vinyl acetate	108-05-4	Acetic acid, ethenyl ester	8260	50
Vinyl chloride; Chloroethene	75-01-4	Ethene, chloro-	8010 8021 8260	2 0.4 10
Xylene (total)	See Note 11	Benzene, dimethyl-	8020 8021 8260	5 0.2 5

Semi-Volatiles (108)

Acenaphthene	83-32-9	Acenaphthylene, 1,2-dihydro-	8100 8270	200 10
Acenaphthylene	208-96-8	Acenaphthylene	8100 8270	200 10
Acetophenone	98-86-2	Ethanone, 1-phenyl-	8270	10
2-Acetylaminofluorene; 2-AAF	53-96-3	Acetamide, N-9H-fluoren-2-yl-	8270	20
4-Aminobiphenyl	92-67-1	[1,1'-Biphenyl]-4-amine	8270	20
Anthracene	120-12-7	Anthracene	8100 8270	200 10
Benzo[a]anthracene; Benzanthracene	56-55-3	Benz[a]anthracene	8100 8270	200 10
Benzo[b]fluoranthene	205-99-2	Benz[e]acephenanthrylene	8100 8270	200 10
Benzo[k]fluoranthene	207-08-9	Benzo[k]fluoranthene	8100 8270	200 10
Benzo[ghi]perylene	191-24-2	Benzo[ghi]perylene	8100 8270	200 10
Benzo[a]pyrene	50-32-8	Benzo[a]pyrene	8100 8270	200 10
Benzyl alcohol	100-51-6	Benzenemethanol	8270	20
Bis(2-chloroethoxy)methane	111-91-1	Ethane, 1,1'-[methylenebis (oxy)]bis[2-chloro-	8110 8270	5 10
Bis(2-chloroethyl)ether; Dichloroethhyl ether	111-44-4	Ethane, 1,1'-oxybis[2-chloro-	8110 8270	3 10
Bis(2-chloro-1-methylethyl) ether; 2,2'-Dichlorodiisopropyl ether; DCIP, See note 7	108-60-1	Propane, 2,2'-oxybis[1-chloro-	8110 8270	10 10
Bis(2-ethylhexyl) phthalate	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl)ester	8060	20
4-Bromophenyl phenyl ether	101-55-3	Benzene, 1-bromo-4-phenoxy-	8110 8270	25 10
Butyl benzyl phthalate; Benzyl butyl phthalate	85-68-7	1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester	8060 8270	5 10
p-Chloroaniline	106-47-8	Benzenamine, 4-chloro-	8270	20
Chlorobenzilate	510-15-6	Benzeneacetic acid, 4-chloro-α-(4-chlorophenyl)-α-hydroxy-, ethyl ester	8270	10
p-Chloro-m-cresol; 4-Chloro-3-methylphenol	59-50-7	Phenol, 4-chloro-3-methyl-	8040 8270	5 20
2-Chloronaphthalene	91-58-7	Naphthalene, 2-chloro-	8120 8270	10 10
2-Chlorophenol	95-57-8	Phenol, 2-chloro-	8040 8270	5 10
4-Chlorophenyl phenyl ether	7005-72-3	Benzene, 1-chloro-4-phenoxy-	8110 8270	40 10
Chrysene	218-01-9	Chrysene	8100 8270	200 10
m-Cresol; 3-methylphenol	108-39-4	Phenol, 3-methyl-	8270	10

o-Cresol; 2-methylphenol	95-48-7	Phenol, 2-methyl-	8270	10
p-Cresol; 4-methylphenol	106-44-5	Phenol, 4-methyl-	8270	10
Diallate	2303-16-4	Carbamothioic acid, bis(1-methylethyl)- , S- (2,3-dichloro-2-propenyl) ester	8270	10
Dibenz[a,h]anthracene	53-70-3	Dibenz[a,h]anthracene	8100 8270	200 10
Dibenzofuran	132-64-9	Dibenzofuran	8270	10
3,3'-Dichlorobenzidine	91-94-1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-	8270	20
2,4-Dichlorophenol	120-83-2	Phenol, 2,4-dichloro-	8040 8270	5 10
2,6-Dichlorophenol	87-65-0	Phenol, 2,6-dichloro-	8270	10
Diethyl phthalate	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester	8060 8270	5 10
O,O-Diethyl O-2-pyrazinyl phosphorothioate;Thionazin	297-97-2	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	8141 8270	5 20
Dimethoate	60-51-5	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester	8141 8270	3 20
p-(Dimethylamino)azobenzene	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-	8270	10
7,12-Dimethylbenz[a]anthracene	57-97-6	Benz[a]anthracene, 7,12-dimethyl-	8270	10
3,3'-Dimethylbenzidine	119-93-7	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-	8270	10
2,4-Dimethylphenol; m-Xylenol	105-67-9	Phenol, 2,4-dimethyl-	8040 8270	5 10
Dimethyl phthalate	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester	8060 8270	5 10
m-Dinitrobenzene	99-65-0	Benzene, 1,3-dinitro-	8270	20
4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol	534-52-1	Phenol, 2-methyl-4,6-dinitro-	8040 8270	150 50
2,4-Dinitrophenol	51-28-5	Phenol, 2,4-dinitro-	8040 8270	150 50
2,4-Dinitrotoluene	121-14-2	Benzene, 1-methyl-2,4-dinitro-	8090 8270	0.2 10
Di-n-butyl phthalate	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester	8060 8270	5 10
2,6-Dinitrotoluene	606-20-2	Benzene, 2-methyl-1,3-dinitro-	8090 8270	0.1 10
Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-	8150 8270	1 20
Di-n-octyl phthalate	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester	8060 8270	30 10
Diphenylamine	122-39-4	Benzenamine, N-phenyl-	8270	10
Disulfoton	298-04-4	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl]ester	8140 8141 8270	2 0.5 10
Ethyl methanesulfonate	62-50-0	Methanesulfonic acid, ethyl ester	8270	20

Famphur	52-85-7	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl]-O,O-dimethyl ester	8270	20
Fluoranthene	206-44-0	Fluoranthene	8100 8270	200 10
Fluorene	86-73-7	9H-Fluorene	8100 8270	200 10
Hexachlorobenzene	118-74-1	Benzene, hexachloro-	8120 8270	0.5 10
Hexachlorobutadiene	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	8021 8120 8260 8270	0.5 5 10 10
Hexachlorocyclopentadiene	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	8120 8270	5 10
Hexachloroethane	67-72-1	Ethane, hexachloro-	8120 8260 8270	0.5 10 10
Hexachloropropene	1888-71-7	1-Propene, 1,1,2,3,3,3-hexachloro-	8270	10
Indeno(1,2,3-cd)pyrene	193-39-5	Indeno[1,2,3-cd]pyrene	8100 8270	200 10
Isodrin	465-73-6	1,4,5,8-Dimethanonaphthalene,1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a hexahydro-(1α,4α,4aß,5ß,8ß,8aß)-	8270 8260	20 10
Isophorone	78-59-1	2-Cyclohexen-1-one, 3,5,5-trimethyl-	8090 8270	60 10
Isosafrole	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-	8270	10
Kepone	143-50-0	1,3,4-Metheno-2H-cyclobuta-[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachloro-octahydro-	8270	20
Methapyrilene	91-80-5	1,2,Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-	8270	100
3-Methylcholanthrene	56-49-5	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	8270	10
Methyl methanesulfonate	66-27-3	Methanesulfonic acid, methyl ester	8270	10
2-Methylnaphthalene	91-57-6	Naphthalene, 2-methyl-	8270	10
Methyl parathion; Parathion methyl	298-00-0	Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	8140 8141 8270	0.5 1 10
1,4-Naphthoquinone	130-15-4	1,4-Naphthalenedione	8270	10
1-Naphthylamine	134-32-7	1-Naphthalenamine	8270	10
2-Naphthylamine	91-59-8	2-Naphthalenamine	8270	10
o-Nitroaniline; 2-Nitroaniline	88-74-4	Benzenamine, 2-nitro-	8270	50
m-Nitroaniline; 3-Nitroaniline	99-09-2	Benzenamine, 3-nitro-	8270	50
p-Nitroaniline;4-Nitroaniline	100-01-6	Benzenamine, 4-nitro-	8270	50

Nitrobenzene	98-95-3	Benzene, nitro-	8090 8270	40 10
o-Nitrophenol; 2-Nitrophenol	88-75-5	Phenol, 2-nitro-	8040 8270	5 10
p-Nitrophenol; 4-Nitrophenol	100-02-7	Phenol, 4-nitro-	8040 8270	10 50
N-Nitrosodiethylamine	55-18-5	Ethanamine, N-ethyl-N-nitroso-	8270	20
N-Nitrosodimethylamine	62-75-9	Methanamine, N-methyl-N-nitroso-	8070	2
N-Nitrosodi-n-butylamine	924-16-3	1-Butanamine, N-butyl-N-nitroso-	8270	10
N-Nitrosodiphenylamine	86-30-6	Benzenamine, N-nitroso-N-phenyl-	8070	5
N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine	621-64-7	1-Propanamine, N-nitroso-N-propyl-	8070	10
N-Nitrosomethylethylamine	10595-95-6	Ethanamine, N-methyl-N-nitroso-	8270	10
N-Nitrosomorpholine	59-89-2	Morpholine, 4-nitroso-	8270	10
N-Nitrosopiperidine	100-75-4	Piperidine, 1-nitroso-	8270	20
N-Nitrosopyrrolidine	930-55-2	Pyrrolidine, 1-nitroso-	8270	40
5-Nitro-o-toluidine	99-55-8	Benzenamine, 2-methyl-5-nitro-	8270	10
Pentachlorophenol	87-86-5	Phenol, pentachloro-	8040 8270	5 50
Phenanthrene	85-01-8	Phenanthrene	8100 8270	200 10
Phenol	108-95-2	Phenol	8040	1
p-Phenylenediamine	106-50-3	1,4-Benzenediamine	8270	10
Pentachlorobenzene	608-93-5	Benzene, pentachloro-	8270	10
Pentachloronitrobenzene	82-68-8	Benzene, pentachloronitro-	8270	20
Phenacetin	62-44-2	Acetamide, N-(4-ethoxyphenyl)	8270	20
Phorate	298-02-2	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester	8140 8141 8270	2 0.5 10
Pronamide	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	8270	10
Pyrene	129-00-0	Pyrene	8100 8270	200 10
Safrole	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-	8270	10
1,2,4,5-Tetrachloro-benzene	95-94-3	Benzene, 1,2,4,5-tetrachloro-	8270	10
2,3,4,6-Tetrachlorophenol	58-90-2	Phenol, 2,3,4,6-tetrachloro-	8270	10
o-Toluidine	95-53-4	Benzenamine, 2-methyl-	8270	10
2,4,5-Trichlorophenol	95-95-4	Phenol, 2,4,5-trichloro-	8270	10
2,4,6-Trichlorophenol	88-06-2	Phenol, 2,4,6-trichloro-	8040 8270	5 10

O,O,O-Triethyl phosphorothioate	126-68-1	Phosphorothioic acid, O,O,O-triethyl ester	8270	10
sym-Trinitrobenzene	99-35-4	Benzene, 1,3,5-trinitro-	8270	10

Pesticides (20)

Aldrin	309-00-2	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-(1α,4α,4aß,5α, 8α,8aß)-	8080 8270	0.05 10
alpha-BHC	319-84-6	Cyclohexane, 1,2,3,4,5,6-hexachloro-,(1α, 2α,3ß,4α,5ß,6ß)-	8080 8270	0.05 10
beta-BHC	319-85-7	Cyclohexane, 1,2,3,4,5,6-hexachloro- ,(1α,2ß,3α,4ß,5α,6ß)-	8080 8270	0.05 20
delta-BHC	319-86-8	Cyclohexane, 1,2,3,4,5,6-hexachloro-,(1α, 2α,3α,4ß,5α,6ß)-	8080 8270	0.1 20
gamma-BHC; Lindane	58-89-9	Cyclohexane, 1,2,3,4,5,6-hexachloro- ,(1α,2α,3ß,4α,5α,6ß)-	8080 8270	0.05 20
Chlordane	See Note 8	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-	8080 8270	0.1 50
4,4'-DDD	72-54-8	Benzene 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	8080 8270	0.1 10
4,4'-DDE	72-55-9	Benzene, 1,1'-(dichloroethenylidene)bis[4-chloro-	8080 8270	0.05 10
4,4'-DDT	50-29-3	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-	8080 8270	0.1 10
Dieldrin	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexa,chloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aα,2ß,2aα,3ß,6ß,6aα,7ß,7aα)-	8080 8270	0.05 10
Endosulfan I	959-98-8	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide, (3α,5aß,6α,9α,9aß)-	8080 8250	0.1 10
Endosulfan II	33213-65-9	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide, (3α,5aα,6ß,9ß,9aα)-	8080 8270	0.05 20
Endosulfan sulfate	1031-07-8	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3,3-dioxide	8080 8270	0.5 10
Endrin	72-20-8	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aα, 2ß,2aß,3α,6α, 6aß,7ß,7aα)-	8080 8270	0.1 20

Endrin aldehyde	7421-93-4	1,2,4-Methenocyclopenta[cd]pentalene-5-carboxaldehyde, 2,2a,3,3,4,7-hexachlorodecahydro-, (1α,2ß,2aß,4ß,4aß,5ß,6ß,,6bß,7R*)-	8080 8270	0.2 10
Heptachlor	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	8080 8270	0.05 10
Heptachlor epoxide	1024-57-3	2,5-Methano-2H-indeno[1,2-b]oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a,-hexahydro-, (1aα,1bß,2α,5α,5aß,6ß,6aα)	8080 8270	1 10
Methoxychlor	72-43-5	Benzene, 1,1'-(2,2,2,trichloroethylidene)bis[4-methoxy-	8080 8270	2 10
Parathion	56-38-2	Phosphorothioic acid, O,O-diethyl-O-(4-nitrophenyl) ester	8141 8270	0.5 10
Toxaphene	See Note 10	Toxaphene	8080	2

Herbicides (3)

2,4-D; 2,4-Dichlorophenoxy-acetic acid	94-75-7	Acetic acid, (2,4-dichlorophenoxy)-	8150	10
2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid	93-76-5	Acetic acid, (2,4,5-trichlorophenoxy)-	8150	2
Silvex; 2,4,5-TP	93-72-1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-	8150	2

PCBs (7)

Polychlorinated biphenyls; PCBs; Aroclors	See Note 9	1,1'-Biphenyl, chloro derivatives	8080 8270	50 200

---

[1]The regulatory requirements pertain only to the list of substances; the right hand columns (Methods and PQL) are given for informational purposes only. See also footnotes 5 and 6.

[2]Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

[3]Chemical Abstracts Service registry number. Where "Total" is entered, all species in the groundwater that contain this element are included.

[4]CAS index names are those used in the 9th Collective Index.

[5]Suggested Methods refer to analytical procedure numbers used in EPA Report SW-846 "Test Methods for Evaluating Solid Waste", third edition, November 1986, as revised, December 1987. Analytical details can be found in SW-846 and in documentation on file at the department. CAUTION: The methods listed are representative SW-846 procedures and may not always be the most suitable method(s) for monitoring an analyte under the regulations.

[6]Practical Quantitation Limits (PQLs) are the lowest concentrations of analytes in groundwaters that can be reliably determined within specified limits of precision and accuracy by the indicated methods under routine laboratory operating conditions. The PQLs listed are generally stated to one significant figure. PQLs are based on 5 mL samples for volatile organics and 1 L samples for semivolatile organics. CAUTION: The PQL values in many cases are based only on a general estimate for the method and not on a determination for individual compounds; PQLs are not a part of the regulation.

[7]This substance is often called Bis(2-chlorolsopropyl) ether, the name Chemical Abstracts Service applies to its noncommercial isomer, Propane, 2,2"-oxybis[2-chloro- (CAS RN 39638-32-9)

[8]Chlordane: This entry includes alpha-chlordane (CAS RN 5103-71-9), beta-chlordane (CAS RN 5103-74-2), gamma-chlordane (CAS RN 5566-34-7), and constituents of chlordane (CAS RN 57-74-9 and CAS RN 12789-03-6). PQL shown is for technical chlordane. PQLs of specific isomers are about 20 μg/L by method 8270.

[9]Polychlorinated biphenyls (CAS RN 1336-36-3); this category contains congener chemicals, including constituents of Aroclor 1016 (CAS RN 12674-11-2), Aroclor 1221 (CAS RN

11104-28-2), Aroclor 1232 (CAS RN 11141-16-5), Aroclor 1242 (CAS RN 53469-21-9), Aroclor 1248 (CAS RN 12672-29-6), Aroclor 1254 (CAS RN 11097-69-1), and Aroclor 1260 (CAS RN 11096-82-5). The PQL shown is an average value for PCB congeners.

[10]Toxaphene: This entry includes congener chemicals contained in technical toxaphene (CAS RN 8001-35-2), i.e., chlorinated camphene.

[11]Xylene (total): This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN. 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7). PQLs for method 8021 are 0.2 for o-xylene, and 0.1 for m- or p-xylene. The PQL for m-xylene is 2.0 μg/L by method 8020 or 8260.