

CHAPTER 15, DIVISION 3, TITLE 23

Chapter 15. Discharges of Hazardous Waste to Land

Article 1. General

§2510. Applicability.

(a) The regulations in this chapter pertain to water quality aspects of waste discharge to land. The regulations in this chapter establish waste and site classifications and waste management requirements for waste treatment, storage, or disposal in landfills, surface impoundments, waste piles, and land treatment facilities. Requirements in this chapter are minimum standards for proper management of each waste category. Regional boards may impose more stringent requirements to accommodate regional and site-specific conditions. In addition, the requirements of this chapter apply to cleanup and abatement actions for unregulated discharges to land of hazardous waste (e.g., spills), taken pursuant to &III.F.2. of SWRCB Resolution No. 92-49 (Section 2907, Title 23 of this code); the SWRCB-promulgated sections of Subdivision 1, Division 2, Title 27 of this code apply in a corresponding fashion to unregulated discharges to land of solid waste.

(b) Unless otherwise specified, alternatives to construction or prescriptive standards contained in this chapter may be considered. Alternatives shall only be approved where the discharger demonstrates that:

(1) the construction or prescriptive standard is not feasible as provided in subsection (c) of this section, and

(2) there is a specific engineered alternative that:

(A) is consistent with the performance goal addressed by the particular construction or prescriptive standard; and

(B) affords equivalent protection against water quality impairment.

(c) To establish that compliance with prescriptive standards in this chapter is not feasible for the purposes of subsection (b) of this section, the discharger shall demonstrate that compliance with a prescriptive standard:

(1) is unreasonably and unnecessarily burdensome and will cost substantially more than alternatives which meet the criteria in subsection (b) of this section; or

(2) is impractical and will not promote attainment of applicable performance standards. Regional boards shall consider all relevant technical and economic factors including, but not limited to, present and projected costs of compliance, potential costs for remedial action in the event that waste or leachate is released to the environment, and the extent of ground water resources which could be affected.

(d) Waste management units which are operating, or have received all permits necessary for construction and operation, on or before November 27, 1984 shall be designated as existing waste management units. This includes disposal sites classified under previous regulations and unclassified waste management units. Dischargers shall continue to operate existing waste management units under existing classifications and waste discharge requirements until those classifications and requirements are reviewed in accordance with Subsection 2591(c) of this chapter. Dischargers who have not filed a report of waste discharge for an existing waste management unit before the effective date of this chapter shall do so within 60 days. Existing

waste management units shall be closed and maintained after closure according to Article 8 of this chapter. All other waste management units, including expansions and reconstructions of existing waste management units, shall comply with all applicable provisions of this chapter, as summarized in Table 3.1 and in Subsection 2540(d) of this chapter. Pending review and reclassification, the following provisions of this chapter shall apply to existing waste management units:

(1) within six months, dischargers are required to develop monitoring programs which comply with the requirements of Article 5 of this chapter for existing waste management units, and shall submit such programs to regional boards for approval; and

(2) dischargers may be required to submit additional technical and monitoring reports to regional water quality control boards as determined to be necessary on a case-by-case basis.

(e) In reviewing waste discharge requirements for existing waste management units, regional boards shall consider the results of monitoring programs developed under subsection (d)(1) of this subsection and technical and monitoring reports submitted under subsection (d)(2) of this section. Existing waste management units shall be reclassified according to the geologic sitting criteria in Article 3 of this chapter (as summarized in Table 3.1) and shall be required to comply with applicable construction standards in Article 4 of this chapter (as summarized in subsection 2540(d) of this chapter) as feasible. To establish that retrofitting is not feasible, the discharger shall be required to make the demonstrations in subsections (b) and (c) of this section.

(f) Regional boards shall implement the regulations in this chapter through the issuance of waste discharge requirements for waste management units.

(g) Persons responsible for discharges at waste management units which are closed, abandoned, or inactive on the effective date of these regulations may be required to develop and implement a monitoring program in accordance with Article 5 of this chapter. If water quality impairment is found, such persons may be required to develop and implement a corrective action program based on the provisions of this chapter.

(h) Discharges of mining waste, as defined in Subsection 2570(a) of this chapter, shall be regulated only by the provisions of Article 7 of this chapter and by such provisions of the other articles of this chapter as specifically referenced in Article 7.

(i) [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13142, 13260 and 13263, Water Code.

§2511. Exemptions.

The following activities shall be exempt from the provisions of this chapter.

(a) Discharges of domestic sewage or treated effluent which are regulated by waste discharge requirements issued pursuant to Article 9 of this chapter, or for which waste discharge requirements have been waived, and which are consistent with applicable water quality objectives, and treatment or storage facilities associated with municipal wastewater treatment plants, provided that residual sludges or solid waste from wastewater treatment facilities shall be discharged only in accordance with the applicable provisions of this chapter.

(b) Discharges of wastewater to land, including but not limited to evaporation ponds, percolation ponds, or subsurface leachfields if the following conditions are met:

- (1) the applicable regional board has issued waste discharge requirements, reclamation requirements, or waived such issuance;
- (2) the discharge is in compliance with the applicable water quality control plan; and
- (3) the wastewater does not need to be managed according to Chapter 30 of Division 4 of Title 22 of this code as a hazardous waste.

(c) Discharges of waste to wells by injection pursuant to the Underground Injection Control Program established by the United States Environmental Protection Agency (**USEPA**) under the Safe Drinking Water Act, (42 U.S. Code Section 300[h], see Title 40 of the Code of Federal Regulations, Parts 144 to 146, 40 CFR 144 to 146).

(d) Actions taken by or at the direction of public agencies to cleanup or abate conditions of pollution or nuisance resulting from unintentional or unauthorized releases of waste or pollutants to the environment; provided that wastes, pollutants, or contaminated materials removed from the immediate place of release shall be discharged according to Article 2 of this chapter; and further provided that remedial actions intended to contain such wastes at the place of release shall implement applicable provisions of this chapter to the extent feasible.

(e) Discharges of condensate from methane gas recovery operations at classified waste management units if the following conditions are met:

- (1) condensate shall have no chemical additives which could adversely affect containment features, and shall consist only of water and liquid contaminants removed from gas recovered at a waste management unit;
- (2) condensate shall be discharged to a different landfill waste management unit with a leachate collection and removal system operated under waste discharge requirements issued by the regional board, or returned to the waste management unit(s) from which it came; and
- (3) the discharger shall submit a report of waste discharge to the regional board pursuant to Article 9 of this chapter, and shall discharge condensate only in compliance with waste discharge requirements.

(f) Use of nonhazardous decomposable waste as a soil amendment pursuant to applicable best management practices, provided that regional boards may issue waste discharge or reclamation requirements for such use.

(g) Discharges of drilling mud and cuttings from well-drilling operations, provided that such discharges are to on-site sumps and do not contain halogenated solvents. At the end of drilling operations, the discharger shall either:

- (1) remove all wastes from the sump; or

(2) remove all free liquid from the sump and cover residual solid and semi-solid wastes, provided that representative sampling of the sump contents after liquid removal shows residual solid wastes to be nonhazardous. If the sump has appropriate containment features, it may be reused.

(h) Recycling or other use of materials salvaged from waste, or produced by waste treatment, such as scrap metal, compost, and recycled chemicals, provided that discharges of residual wastes from recycling or treatment operations to land shall be according to applicable provisions of this chapter.

(i) Waste treatment in fully enclosed facilities, such as tanks, or in concrete-lined facilities of limited areal extent, such as oil-water separators designed, constructed, and operated according to American Petroleum Institute specifications.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13142, 13260 and 13269, Water Code.

Article 2. Waste Classifications and Management

§2521. Hazardous Waste.

(a) Hazardous waste is any waste which, under Section 66261.3 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4 of Title 22 of this code.

(b) Hazardous wastes shall be discharged only at Class I waste management units which comply with the applicable provisions of this chapter unless wastes qualify for a variance under Section 66260.210 of Title 22 of this code.

(c) Wastes which fall under the restrictions of Chapter 18 of Division 4.5 of Title 22 of this code (§66268.1 et seq.) shall not be discharged for treatment, storage, or disposal except as provided in that chapter.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13050 and 13172, Water Code.

§2522. Designated Waste. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172, Water Code.

§2523. Nonhazardous Solid Waste. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172, Water Code.

§2524. Inert Waste. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172, Water Code.

Article 3. Waste Management Unit Classification and Siting**§2530. Classification and Siting Criteria.**

(a) Waste management units shall be classified according to their ability to contain wastes. Containment shall be determined by geology, hydrology, topography, climatology, and other factors relating to the ability of the waste management unit to protect water quality. A waste management facility may consist of several waste management units each with a different classification [*Note: for Units that receive only solid waste, see §§20200-20260, Subdivision 1, Division 2, Title 27 of this code*]. Classification of waste management units for hazardous waste shall be based on the criteria contained in this article, on field inspections by RWQCB and State Water Resources Control Board staffs, and on other pertinent information. Information used to classify waste management units shall be submitted according to the provisions of Article 9 of this chapter. Classified waste management units shall comply with appropriate waste discharge requirements.

(b) Existing waste management units for, or that contain, hazardous waste shall be reclassified according to applicable criteria in this article, provided that such units:

(1) comply with siting criteria for each category of existing units in Section 2531 of this article, and summarized in Table 3.1 of this article; and

(2) are operating in compliance with Subsection 2510(d) of this chapter.

(c) All new Class I landfills, waste piles, and surface impoundments shall be sited, designed, constructed, and operated to ensure that wastes will be a minimum of 5 feet above the highest anticipated elevation of underlying ground water. Existing landfills, waste piles, and surface impoundments shall be operated to ensure that wastes will be a minimum of 5 feet above the highest anticipated elevation of underlying ground water. For new and existing land treatment units, the base of the treatment zone shall be a minimum of 5 feet above the highest anticipated elevation of underlying ground water and dischargers shall not be entitled to exemption under Subsection 2510(b) of this chapter.

(d) All containment structures at waste management units shall have a foundation or base capable of providing support for the structures and capable of withstanding hydraulic pressure gradients to prevent failure due to settlement, compression, or uplift as certified by a registered civil engineer or certified engineering geologist.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2531. Class I: Waste Management Units for Hazardous Waste.

(a) Class I disposal units shall be located where natural geologic features provide optimum conditions for isolation of wastes from waters of the state. The classification criteria for new disposal units in this section shall be applied to new treatment and storage units, and shall be used for reclassification of existing waste management units according to the following categories:

(1) existing units at disposal sites approved as Class I under previous regulations and any expansion or reconstruction thereof (designated as "I" in Table 3.1);

(2) existing units at disposal sites approved as limited Class I ("I") or Class II-1 ("II-1") under previous regulations;

(3) existing units used for treatment or storage of hazardous wastes ("T/S"), whether or not classified under previous regulations; and

(4) reconstruction ("REC") or Expansion ("EX") of existing units described in subsections (a)(2) and (a)(3) of this section.

(b) Geologic Setting.

(1) New and existing Class I units shall be immediately underlain by natural geologic materials which have a permeability of not more than 1×10^{-7} cm/sec, and which are of sufficient thickness to prevent vertical movement of fluid, including waste and leachate, from waste management units to waters of the state as long as wastes in such units pose a threat to water quality. Class I units shall not be located where areas of primary (porous) or secondary (rock opening) permeability greater than 1×10^{-7} cm/sec could impair the competence of natural geologic materials to act as a barrier to vertical fluid movement. These provisions do not apply to Class I land treatment facilities.

(2) Natural or artificial barriers shall be used to prevent lateral movement of fluid, including waste and leachate.

(c) **Flooding**--New disposal units and existing units in Category I other than existing land treatment units, shall be located outside of floodplains subject to inundation by floods with a 100-year return period. Other existing units and new treatment and storage units may be located within such floodplains provided that such units are designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return period.

(d) **Ground Rupture**--New units and existing units in Categories I, I', REC, and EX, other than existing land treatment units, shall have a 200-foot setback from any known Holocene fault. Existing units in Categories II-1 and T/S and existing land treatment units may be located within 200 feet of a known Holocene fault, provided that containment structures are capable of withstanding ground accelerations associated with the maximum credible earthquake.

(e) **Rapid Geologic Change**--New disposal units and existing units in Categories I, I', and EX, other than existing land treatment units, shall be located outside areas of potential rapid geologic change. Other units may be located in such areas if containment structures are designed, constructed, and maintained to preclude failure, as a result of such changes.

(f) **Tidal Waves**--New disposal units shall be located outside areas subject to tsunamis, seiches, and surges. Other units may be located within these areas if designed, constructed, and maintained to preclude failure due to such events.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2532. Class II: Waste Management Units for Designated Waste. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2533. Class III: Landfills for Nonhazardous Solid Waste. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

TABLE 3.1 GEOLOGIC AND SITING CRITERIA FOR CLASS I WASTE MANAGEMENT UNITS
Waste Management Unit Classification

Site Characteristics	New Class I	Reclassification of Existing Class I ¹					
		I Yes	I' Yes	II-1 Yes	T/S Yes	REC Yes	EX Yes
Geologic Setting	Maximum attainable isolation from ground water; see Section 2531(b) of this article.	Yes	Yes	Yes			
Flooding	Outside of 100-year floodplain. ⁴	Yes	No ⁵				
Ground Rupture	200' setback from known Holocene fault.	Yes	Yes	No ⁵	No ⁵	Yes	Yes
Rapid Geologic Change	Outside subject area (potential to impair containment) ⁴	Yes	Yes	No ⁵	No ⁵	No ⁵	Yes
Tidal Waves ⁶	Outside subject coastal areas. ⁴				<<----->>		

"Yes" means the unit shall comply with requirements for new Class I facilities.
¹ This category is defined in Subsection 2531(a) of this article.
² [Reserved]
³ [Reserved]
⁴ Waste management units used only for treatment and storage may be located within prescribed areas, provided that exemption from applicable siting criteria is conditioned on protection of treatment and storage from geologic or environmental hazards involved.
⁵ Exemption from siting criteria does not release dischargers from the obligation to protect waste management units from the geologic or environmental hazards involved. Exemption is conditions on such protection.
⁶ "Tidal Waves" includes tsunamis, seiches, and surge condition.

Article 4. Construction Standards for Class I Units

§2540. General Construction Criteria.

- (a) Class I waste management units (**Class I Units**) shall be designed and constructed to prevent migration of wastes from the waste management units to adjacent geologic materials, ground water, or surface water, during disposal operations, closure, and the post-closure maintenance period.
- (b) [Reserved.]
- (c) [Reserved.]
- (d) New Class I landfills, waste piles, and surface impoundments shall comply with the requirements of this article. Existing Class I waste piles and surface impoundments shall be fitted with liners and leachate collection and removal systems as described in Sections 2542 and 2543 of this article as feasible. Existing Class I landfills and waste piles shall have interim cover as described in Section 2544 of this article. Existing Class I landfills, waste piles, and surface impoundments shall be fitted with subsurface barriers as described in Section 2545 of this article as needed and feasible, and shall have precipitation and drainage control facilities as described in Section 2546 of this article. Existing Class I surface impoundments shall comply with Section 2548 of this article. New and existing Class I land treatment units shall comply with Section

2549 of this article. All existing Class I waste management units shall comply with the seismic design criteria in Section 2547 of this article.

(e) Containment structures shall be designed by and construction shall be supervised and certified by a registered civil engineer or a certified engineering geologist. Facilities shall receive

Table 4.1. Construction Standards for Waste Management Units¹

Waste Precipitation and Mgmt Unit Drainage Control Classification Facilities	Type of Waste Management Seismic Unit Design	Leachate				Capacity of Subsurface Barriers			
		Synthetic Clay Liner ⁽²⁾	Collection and Interim Removal System	Interim Cover	Cutoff Walls	Grout Curtains			
Class I	Landfill	required, $\leq 1 \cdot 10^{-7}$ cm/sec	required ⁽⁷⁾	required, blanket type	required	$\leq 1 \cdot 10^{-7}$ cm/sec ⁽¹⁰⁾	$\leq 1 \cdot 10^{-7}$ cm/sec	probable maximum precipitation	withstand maximum credible earthquake
	Surface Impoundment	double liner ⁽³⁾ $\leq 1 \cdot 10^{-7}$ cm/sec	required ⁽⁸⁾	required, blanket type		$\leq 1 \cdot 10^{-7}$ cm/sec ⁽¹⁰⁾	$\leq 1 \cdot 10^{-7}$ cm/sec		
	Waste Pile	optional ⁽⁴⁾ , $\leq 1 \cdot 10^{-7}$ cm/sec	may be ⁽⁹⁾ required	required, blanket type	required	$\leq 1 \cdot 10^{-7}$ cm/sec ⁽¹⁰⁾	$\leq 1 \cdot 10^{-7}$ cm/sec		

¹ Applicable regulations in this article may provide for exemptions to certain requirements. Subsection 2540(d) of this article describes applicability to existing facilities.

² All permeabilities specified in this table are maximum allowable permeabilities.

³ Outer liner shall be a clay liner; inner liner may be a synthetic liner instead of a clay liner if inspected according to Subsection 2548(f) of this article.

⁴ A synthetic liner alone may be allowed based on nature of waste to be contained and duration of the operation. A waste pile with a synthetic liner alone may not be closed as a landfill pursuant to Section 2583 of this chapter. The synthetic liner permeability shall be the same or less than that which would be required for a clay liner.

⁵ [Reserved]

⁶ [Reserved]

⁷ Synthetic inner liner required in addition to a clay outer liner unless exempted pursuant to Subsection 2510(b) of this chapter.

⁸ Synthetic inner liner required in addition to a clay liner unless the surface impoundment is closed according to Subsection 2582(b)(1) of this chapter, or unless exempted pursuant to Subsection 2510(b) of this chapter.

⁹ Synthetic inner liner required unless the pile is closed according to Subsection 2583(a)(1), or unless exempted pursuant to Subsection 2510(b) of this chapter.

¹⁰ Cutoff walls required where there is potential for lateral movement of fluid, including waste or leachate.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

SWRCB's Revised Ch-15

a final inspection and approval of the construction by regional board or State Board staff before use of the facility commences.

(f) The integrity of containment structures shall be maintained. Excavations made as part of discharge operations shall not result in removal of any portion of a containment structure.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2541. General Criteria for Containment Structures.

(a) Materials used in containment structures shall have appropriate chemical and physical properties to ensure that such structures do not fail to contain waste because of pressure gradients (including hydraulic head and external hydrogeologic forces), physical contact with the waste or leachate, chemical reactions with soil and rock, climatic conditions, the stress of installation, and the stress of daily operation.

(b) Permeabilities specified for containment structures other than cover shall be relative to the fluids, including waste and leachate, to be contained. Permeabilities specified for final cover shall be relative to water.

(c) Permeabilities shall be determined primarily by appropriate field test methods in accordance with accepted civil engineering practice. The results of laboratory tests with both water and leachate, and field tests with water, shall be compared to evaluate how the field permeabilities will be affected by leachate. Appropriate compaction tests may be used in conjunction with laboratory permeability tests to determine field permeabilities as long as a reasonable number of field permeability tests are also conducted. One acceptable method for testing the compatibility of leachate and clay liners (including the permeability of the liner to leachate) is given in Appendix I.

(d) Earthen materials used in containment structures other than cutoff walls and grout curtains shall consist of a mixture of clay and other suitable fine-grained soils which have the following characteristics, and which, in combination, can be compacted to attain the required permeability when installed. Liners made of such materials are referred to as "clay liners" in this chapter.

(1) At least 30 percent of the material, by weight, shall pass a No. 200 U.S. Standard sieve.

(2) The materials shall be fine-grained soils with a significant clay content and without organic matter, in the "SC" (clayey sand), "CL" (clay, sandy or silty clay), or "CH" (clay, sandy clay) classes of the Unified Soil Classification system.

(e) Construction standards for waste management units other than land treatment are given on Table 4.1 and in Figure 4.1.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2542. Liners.

(a) Liners shall be designed and constructed to contain the fluid, including waste and leachate, as required by Article 3 of this chapter.

(b) Clay liners for a Class I waste management unit shall be a minimum of 2 feet thick and shall be installed at a relative compaction of at least 90 percent.

(c) Synthetic liners shall have a minimum thickness of 40 mils.

(d) Liners shall be installed to cover all natural geologic materials at a waste management unit likely to be in contact with waste or leachate.

SWRCB's Revised Ch-15

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2543. Leachate Collection and Removal Systems.

(a) Leachate collection and removal systems are required for Class I landfills, surface impoundments, and waste piles. The systems shall be installed directly above underlying containment features for landfills and waste piles, and installed between the liners for surface impoundments. Leachate collection and removal systems requirements are summarized on Table 4.1.

(b) Where leachate collection and removal systems are used, they shall be installed immediately above the liner, or between the inner and outer liner of a double-liner system, and shall be designed, constructed, maintained, and operated to collect and remove twice the maximum anticipated daily volume of leachate from the waste management unit.

(c) Regional boards shall specify design and operating conditions in waste discharge requirements to ensure that there is no buildup of hydraulic head on the liner. The depth of fluid in the collection sump shall be kept at the minimum needed to ensure efficient pump operation.

(d) Leachate collection and removal systems shall be designed and operated to function without clogging through the scheduled closure of the waste management unit and during the post-closure maintenance period. The systems shall be tested at least annually to demonstrate proper operation. The results of the tests shall be compared with earlier tests made under comparable conditions.

(e) Leachate collection and removal system shall consist of a permeable subdrain layer which covers the bottom of the waste management unit and extends as far up the sides as possible, (i.e., blanket-type). The collection and removal system shall be of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the waste management units.

(f) [Reserved]

(g) Collected leachate shall be system returned to the waste management unit(s) from which it came or discharged in another manner approved by the regional board. Collected leachate may be discharged to a different waste management unit if:

(1) the receiving waste management unit has a leachate collection and removal system, contains wastes which are similar in classification and characteristics to those in the waste management unit(s) from which leachate was extracted, and has at least the same classification under Article 3 of this chapter as the units from which leachate was extracted; and

(2) the discharge to a different waste management unit is approved by the regional board; and

(3) the discharge of leachate to a different waste management unit shall not exceed the moisture-holding capacity of the receiving unit, and shall comply with Subsection 2520(d) of this chapter.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2544. Interim Cover.

(a) Interim cover at landfills is daily cover and intermediate cover as defined by the California Waste Management Board.

(b) Interim cover over wastes discharged to a landfill shall be designed and constructed to minimize percolation of precipitation through wastes.

(c) Class I waste piles shall be covered as necessary to prevent percolation of precipitation through wastes.

SWRCB's Revised Ch-15

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2545. Subsurface Barriers.

(a) Subsurface barriers are cutoff walls or grout curtains which are used in conjunction with natural geologic materials to assure that lateral permeability standards specified in Article 3 of this chapter are satisfied. Subsections (b) and (c) specify conditions under which cutoff walls and grout curtains are used.

(b) Cutoff walls.

(1) Cutoff walls are required at Class I waste management units where there is potential for lateral movement of fluid, including waste or leachate.

(2) Cutoff walls shall be:

(A) a minimum of two feet thick for clay materials; or

(B) a minimum of 40 mils thick for synthetic materials; and

(C) keyed a minimum of five feet into natural geologic material which satisfies the applicable permeability requirements in Article 3 of this chapter.

(3) If cutoff walls are used, excavations for waste management units shall be keyed into natural geologic materials which satisfy applicable permeability requirements in Article 3 of this chapter.

(4) At closure of a waste pile or surface impoundment, all contaminated natural geologic materials present between the cutoff wall(s) and the waste shall be removed and disposed of at an authorized location, or the waste management unit shall be closed as a landfill.

(5) Cutoff walls shall have fluid collection systems installed upgradient of the structure. The systems shall be designed, constructed, operated, and maintained to prevent the buildup of hydraulic head against the structure. The collection system shall be inspected regularly, and accumulated fluid shall be removed.

(c) Grout Curtains.

(1) Grout curtains may be used as needed to prevent lateral waste movement through fractures in natural geologic materials that otherwise satisfy applicable permeability requirements in Article 3 of this chapter. Only fractures that are at or near the surface and are of limited vertical extent may be grouted.

(2) The acceptability of grout curtains for a waste management unit shall include consideration of:

(A) depth and nature of fracturing; and

(B) fracture orientation.

(3) Grout characteristics shall not be adversely affected by fluid, including waste and leachate, or natural conditions.

(4) Optimum grouting pressure and placement of grout holes shall be determined by test grouting.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2546. Precipitation and Drainage Controls.

(a) Class I waste management units and containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping under the precipitation conditions specified in Table 4.1 of this article.

SWRCB's Revised Ch-15

(b) Precipitation on Class I landfills or waste piles which is not diverted by covers or drainage control systems shall be collected and managed through the leachate collection and removal system, which shall be designed and constructed to accommodate precipitation conditions specified in Table 4.1 of this article.

(c) Diversion and drainage facilities shall be designed and constructed to accommodate the anticipated volume of precipitation and peak flows from surface runoff under the precipitation conditions specified in Table 4.1 of this article.

(d) Collection and holding facilities associated with precipitation and drainage control systems shall be emptied immediately following each storm or otherwise managed to maintain the design capacity of the system.

(e) Surface and subsurface drainage from outside of a waste management unit shall be diverted from the waste management unit.

(f) Cover materials shall be graded to divert precipitation from the waste management unit, to prevent ponding of surface water over wastes, and to resist erosion as a result of precipitation with the return frequency specified in Table 4.1 of this article.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2547. Seismic Design.

Class I waste management units shall be designed to withstand the maximum credible earthquake without damage to the foundation or to the structures which control leachate, surface drainage, erosion, or gas.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2548. Special Requirements for Surface Impoundments. (a) Surface impoundments shall have sufficient freeboard to accommodate seasonal precipitation and precipitation conditions specified in Table 4.1 of this article but in no case less than 2 feet (measured vertically), and shall be designed and constructed to prevent overtopping as a result of wind conditions likely to accompany such precipitation conditions. A freeboard of less than 2 feet may be allowed at interior surface impoundments of a waste management facility where potential overflows would be to exterior surface impoundments, the operation implements a properly developed water balance plan, and the facility is provided with a fail-safe emergency retention area solely for the purpose of containing wastes due to surface impoundment failures.

(b) An operation plan shall be submitted to the regional board which will provide operation levels and waste input quantities permitted each month based on anticipated precipitation and on past precipitation conditions for the year.

(c) Direct pipeline discharge to surface impoundments shall be either equipped with devices or shall have fail-safe operating procedures to prevent overfilling. Discharges shall be stopped in the event of any containment system failure which causes a threat to water quality.

(d) There shall be no discharge from a surface impoundment except as authorized by waste discharge requirements.

(e) Surface impoundments shall be designed and constructed to prevent scouring of containment structures at points of discharge into the impoundments and by wave action at the waterline.

(f) All visible portions of synthetic liners shall be inspected weekly until all free liquid is removed from the surface impoundment as part of closure. If, during the active life of the impoundment, the wastes are removed and the bottom of the impoundment cleaned down to the liner, an inspection shall be made of the bottom of the liner prior to refilling of the impoundment.

SWRCB's Revised Ch-15

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

§2549. Special Requirements for Land Treatment Facilities.

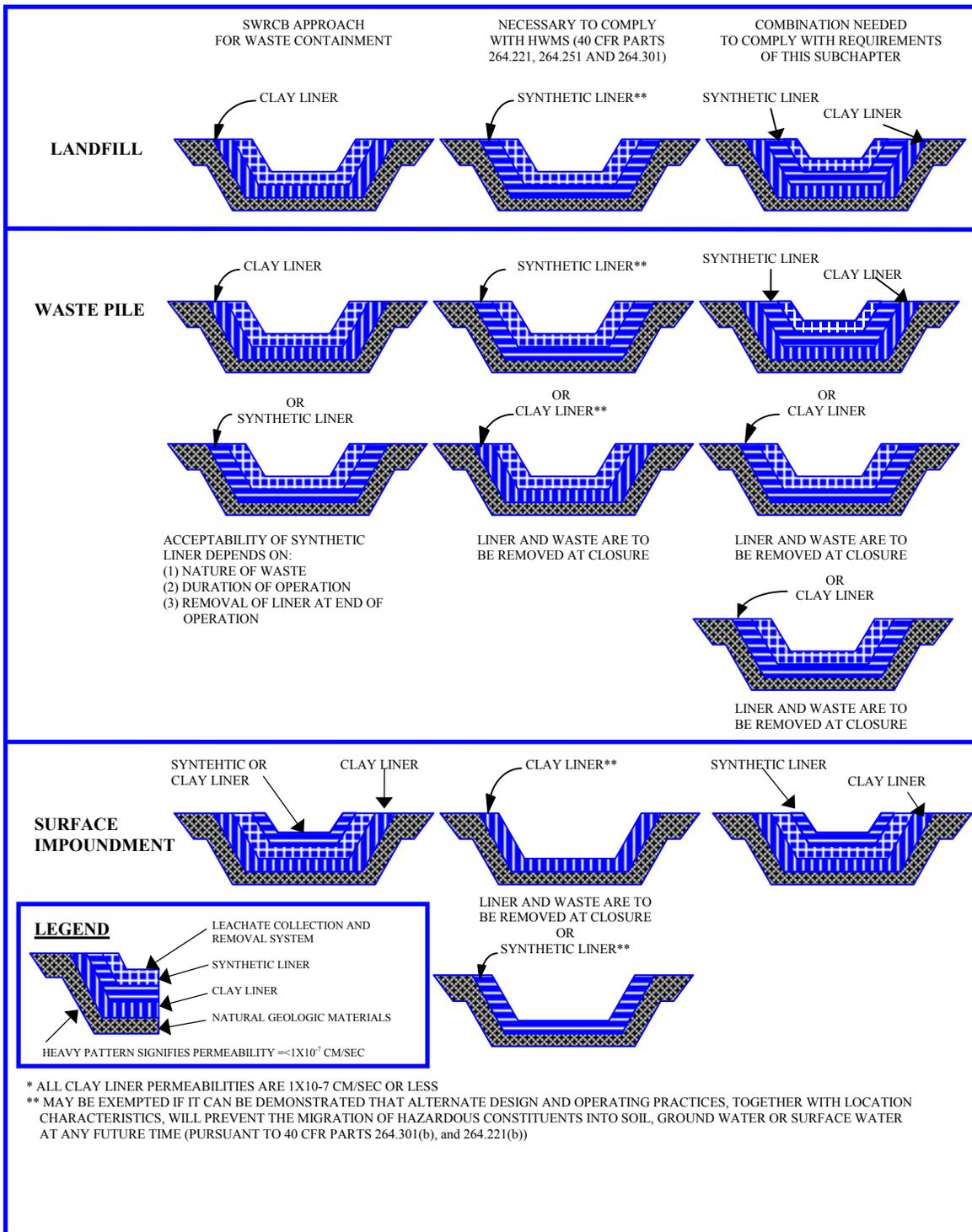
(a) Dischargers operating land treatment facilities shall comply with the general criteria specified in Subsections 2541(a) and (d) of this article, with the precipitation and drainage controls specified in Section 2546 of this article, and with the seismic design criteria in Section 2547 of this article.

(b) Dischargers shall design, construct, operate, and maintain land treatment units to maximize the degradation, transformation, and immobilization of waste constituents in the treatment zone.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13360, Water Code.

Figure 4.1

CLAY AND SYNTHETIC LINER REQUIREMENTS FOR CLASS I LANDFILLS, WASTE PILES & SURFACE IMPOUNDMENTS



Article 5. Water Quality Monitoring and Response Programs for Waste Management Units

§2550. Applicability. [Repealed]

§2550.0. Applicability.

(a) The regulations in this article apply to owners or operators of facilities that treat, store, or dispose of hazardous waste at Class I waste management units. The owner or operator of a surface impoundment, waste pile, landfill, or land treatment unit that receives or has received waste (hereinafter referred to as "waste management units") that is subject to this chapter, pursuant to Article 1 of this chapter, shall comply with the provisions of this article for purposes of detecting, characterizing, and responding to releases to ground water, surface water, or the unsaturated zone. Additionally, notwithstanding any other provision of Article 1 of this chapter, the provisions of this article apply to all waste management units that received hazardous waste between July 26, 1982, and December 8, 1984. Furthermore, §2550.4 of this article also applies to all determinations of alternative cleanup levels for unpermitted discharges to land of hazardous waste, pursuant to &III.G. of SWRCB Resolution No. 92-49 (Section 2907, Title 23 of this code) [§20400 of Title 27 of this code serves a similar function for unpermitted discharges to land of solid waste].

(b) Waste discharge requirements shall contain a provision which requires the discharger to obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known or reasonably foreseeable releases from the waste management unit and for initiating and completing all corrective action required pursuant to subsection (c) of this section and section 2550.12 of this article. The discharger shall obtain financial assurance meeting the requirements of this subsection in accordance with the following schedule:

(1) all waste management units to which waste has not been discharged as of July 1, 1991, shall obtain financial assurances prior to discharging waste;

(2) waste management units in the following categories shall obtain financial assurance within six months after July 1, 1991:

(A) [Reserved];

(B) [Reserved]; and

(C) Class I units that received hazardous waste after July 26, 1982.

(c) Dischargers seeking waste discharge requirements for treatment, storage or disposal of hazardous waste at a facility shall comply with the provisions of section 2550.12 of this article for all areas at the facility, other than waste management units, from which hazardous wastes (or hazardous constituents) have migrated, regardless of the time at which waste was discharged.

(d) The regulations under this article apply during the active life of the waste management unit and the closure period of the unit. After closure of the waste management unit, the regulations in this article apply during the post-closure maintenance period of the waste management unit and during any compliance period under section 2550.6 of this article, unless:

(1) the waste management unit has been in compliance with the water quality protection standard for a period of three consecutive years; and

(2) all waste, waste residues, contaminated containment system components, contaminated subsoils, and all other contaminated materials are removed or decontaminated at closure.

(e) For purposes of this article, subsections 2510(b) and (c) of Article 1 of this chapter do not apply.

(f) For waste management units which are operating, or have received all permits necessary for construction or operation on or before 7-1-91, the discharger shall propose monitoring programs which comply with the provisions of this article and submit these proposed programs to the regional board. Owners or operators of Class I units shall make this submittal within six months of 7-1-91, and the regional board shall revise the waste discharge requirements to implement the provisions of this article within one year of submittal. The discharger shall begin any necessary construction within 30 days of regional board approval of the proposed programs and shall implement the approved monitoring programs according to a schedule of compliance established by the regional board.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13267, Water Code.

§2550.1. Required Programs.

(a) A discharger subject to this article shall conduct a monitoring and response program, approved by the regional board, for each waste management unit at the facility as follows.

(1) The discharger shall institute a detection monitoring program under section 2550.8 of this article except as required under Subsections (a)(2), (a)(3), and (a)(4) of this section;

(2) The discharger shall institute an evaluation monitoring program under section 2550.9 of this article whenever there is statistically significant evidence of a release, pursuant to subsections 2550.8(g) or (i) of this article, from the waste management unit during a detection monitoring program;

(3) The discharger shall institute an evaluation monitoring program under section 2550.9 of this article whenever there is significant physical evidence of a release from the waste management unit. Significant physical evidence of a release includes unexplained volumetric changes in surface impoundments, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of leachate migration, and unexplained water table mounding beneath or adjacent to the waste management unit and any other change to the environment that could reasonably be expected to be the result of a release from the waste management unit; and

(4) The discharger shall institute a corrective action program under section 2550.10 of this article when the regional board determines pursuant to section 2550.9 of this article that the assessment of the nature and extent of the release and the design of a Corrective Action Program have been satisfactorily completed and the regional board approves the application for an amended report of waste discharge for corrective action submitted by the discharger during an evaluation monitoring program pursuant to subsection 2550.9(d) of this article.

(b) The regional board shall specify in the waste discharge requirements the specific type or types of monitoring programs required and the specific elements of each monitoring and response program. For each waste management unit, the regional board shall require one or more of the programs identified in subsection (a) of this section that is appropriate for the prevailing state of containment at the waste management unit and shall specify the circumstances under which each of the programs will be required. In deciding whether to require the discharger to be prepared to institute a particular program, the regional board shall consider the potential adverse effects on human health or the environment that might occur before final administrative action on an amended report of waste discharge to incorporate such a program could be taken.

(c) In conjunction with an evaluation monitoring program or a corrective action program, the discharger shall continue to conduct a detection monitoring program under section 2550.8 of this article as necessary to provide the best assurance of the detection of subsequent releases from the waste management unit.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, 13267, and 13304 Water Code.

§2550.2. Water Quality Protection Standard.

(a) For each Class I waste management unit, the regional board shall establish a water quality protection standard in the waste discharge requirements. This water quality protection standard shall consist of the list of constituents of concern under section 2550.3 of this article, the concentration limits under section 2550.4 of this article, and the point of compliance and all monitoring points under section 2550.5 of this article. This water quality protection standard shall apply during the active life of the waste management unit, the closure period, the post-closure maintenance period, and during any compliance period under section 2550.6 of this article.

(b) If a discharger is conducting a detection monitoring program in conjunction with an evaluation or corrective action program for a Class I waste management unit pursuant to section 2550.1(c) of this article, the regional board may establish separate water quality protection standards for each program.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, and 13267, Water Code.

§2550.3. Constituents of Concern.

For each Class I waste management unit, the regional board shall specify in the waste discharge requirements the constituents of concern to which the water quality protection standard of section 2550.2 of this article applies. Constituents of concern are the waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, and 13267, Water Code.

§2550.4. Concentration Limits.

[Note: The special applicability of this section is described in §2550.0(a) of this article; see also §2510(a) of this chapter.]

(a) For each constituent of concern that is specified pursuant to section 2550.3 of this article [or for a hazardous constituent that is addressed by a cleanup and abatement action taken pursuant to SWRCB Resolution No. 92-49 (Section 2901, Title 23 of this code)], the discharger shall propose one of the following for each medium (including ground water, surface water, and the unsaturated zone) that is monitored pursuant to section 2550.7 of this article (or that is included in a cleanup and abatement action under SWRCB Resolution No. 92-49):

(1) a concentration limit not to exceed the background value of that constituent as determined pursuant to subsection 2550.7(e)(11)(A) of this article;

(2) that the waste discharge requirements include a statement that, at any given time, the concentration limit for that constituent will be equal to the background value of that constituent, as determined pursuant to subsection 2550.7(e)(11)(B) of this article; or

(3) a concentration limit greater than background established pursuant to this section for a corrective action program.

(b) The regional board shall review the proposed concentration limits and statements and shall approve, modify, or disapprove each proposed limit and each proposed statement. Upon final approval by the regional board, each concentration limit and each statement shall be specified in waste discharge requirements. The regional board shall approve more than one concentration limit for different monitoring points in the same medium only if:

- (1) more than one background condition exists within a particular medium;
- (2) the statistical method approved for a constituent uses intra-well comparisons procedures; or
- (3) concentration limits greater than background have been established for a corrective action program at the monitoring points in the zone affected by a release from the waste management unit.

(c) For a corrective action program, the regional board shall establish a concentration limit for a constituent of concern that is greater than the background value of that constituent only if the regional board finds that it is technologically or economically infeasible to achieve the background value for that constituent and that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the concentration limit greater than background is not exceeded. In making this finding, the regional board shall consider the factors specified in subsection (d) of this section, the results of the engineering feasibility study submitted pursuant to subsection 2550.9(c) of this article, data submitted by the discharger pursuant to subsection 2550.9(d)(2) of this article to support the proposed concentration limit greater than background, public testimony on the proposal, and any additional data obtained during the evaluation monitoring program.

(d) In establishing a concentration limit greater than background for a constituent of concern, the regional board shall consider the following factors:

- (1) potential adverse effects on ground water quality and beneficial uses, considering:
 - (A) the physical and chemical characteristics of the waste in the waste management unit;
 - (B) the hydrogeological characteristics of the facility and surrounding land;
 - (C) the quantity of ground water and the direction of ground water flow;
 - (D) the proximity and withdrawal rates of ground water users;
 - (E) the current and potential future uses of ground water in the area;
 - (F) the existing quality of ground water, including other sources of contamination or pollution and their cumulative impact on the ground water quality;
 - (G) the potential for health risks caused by human exposure to waste constituents;
 - (H) the potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and
 - (I) the persistence and permanence of the potential adverse effects; and
- (2) potential adverse effects on surface water quality and beneficial uses, considering:
 - (A) the volume and physical and chemical characteristics of the waste in the waste management unit;
 - (B) the hydrogeological characteristics of the facility and surrounding land;
 - (C) the quantity and quality of ground water and the direction of ground water flow;
 - (D) the patterns of precipitation in the region;
 - (E) the proximity of the waste management unit to surface waters;
 - (F) the current and potential future uses of surface waters in the area;
 - (G) the existing quality of surface water including other sources of contamination or pollution and the cumulative impact on surface water quality;
 - (H) the potential for health risks caused by human exposure to waste constituents;
 - (I) the potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and

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

(e) In no event shall a concentration limit greater than background established under this section for a constituent of concern exceed the lowest concentration that the discharger demonstrates and the regional board finds is technologically and economically achievable. No provision of this section shall be taken to allow a concentration limit greater than background, for a constituent of concern, to exceed the maximum concentration that would be allowed under other applicable statutes or regulations (e.g., Maximum Concentration Limits established under the federal Safe Drinking Water Act [P.L. 93-523, codified as Subchapter XII of the Public Health Service Act at 42 USC 300f, et. seq.; regulations establishing MCL's are located in 40 CFR Part 141, Subpart B], etc.).

(f) For ground water, in evaluating risk pursuant to subsection (d) of this section to any biological receptor, the risk shall be evaluated as if exposure would occur at the point of compliance.

(g) Proposals for concentration limits greater than background shall include a demonstration that the aggregate of hazardous constituents in the environment will not result in excessive exposure to a sensitive biological receptor. In the absence of scientifically valid data to the contrary, theoretical risks from chemicals associated with the release from the waste management unit shall be considered additive across all media of exposure, and shall be considered additive for all chemicals having similar toxicological effects or having carcinogenic effects.

(h) A concentration limit greater than background may only be applied during corrective action, or during detection monitoring following corrective action, at monitoring points at which statistically significant evidence of the release has been determined.

(i) When a detection monitoring program incorporating a concentration limit greater than background is reinstated after a corrective action program has been terminated, each concentration limit greater than background shall be re-evaluated during each review of waste discharge requirements or at least every five years. If the regional board, upon re-evaluation, determines that the concentration of a constituent of concern in ground water, surface water, or the unsaturated zone is lower than its associated concentration limit by a statistically significant amount, the concentration limit for that constituent shall be lowered to reflect current water quality.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, and 13267, Water Code.

§2550.5. Monitoring Points and the Point of Compliance.

(a) For each Class I waste management unit, the regional board shall specify in the waste discharge requirements the point of compliance at which the water quality protection standard of section 2550.2 of this article applies. The point of compliance is a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit. For each Class I waste management unit, the regional board shall specify monitoring points at the point of compliance and additional monitoring points at locations determined pursuant to section 2550.7 of this article at which the water quality protection standard under section 2550.2 of this article applies and at which monitoring shall be conducted.

(b) If the facility contains contiguous waste management units and monitoring along a shared boundary would impair the integrity of a containment or structural feature of any of the units, the point of compliance may be located at the hydraulically downgradient limit of an area described by an imaginary line along the outer boundary of the contiguous waste management units. This provision only applies to contiguous waste management units that have operated or have received all permits necessary for construction and operation before 7-1-91.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, and 13267, Water Code.

§2550.6. Compliance Period.

(a) The regional board shall specify in waste discharge requirements a compliance period for each Class I waste management unit. The compliance period is the number of years equal to the active life of the waste management unit (including any waste management activity prior to the adoption of the waste discharge requirements) plus the closure period. The compliance period is the minimum period of time during which the discharger shall conduct a water quality monitoring program subsequent to a release from the unit.

(b) The compliance period begins anew each time the discharger initiates an evaluation monitoring program meeting the requirements of Section 2550.9 of this article.

(c) If the discharger is engaged in a corrective action program at the scheduled end of the compliance period specified under subsection (a) of this section, the compliance period shall be extended until the discharger can demonstrate that the waste management unit has been in continuous compliance with its water quality protection standard of Section 2550.2 of this article for a period of three consecutive years.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, and 13267, Water Code.

§2550.7. General Water Quality Monitoring and System Requirements.

(a) The discharger shall comply with the requirements of this section for any water quality monitoring program developed to satisfy sections 2550.8, 2550.9, or 2550.10 of this article.

(b) Ground Water Monitoring System.

(1) Except as provided under subsection (e)(3) of this section, the discharger shall establish a ground water monitoring system for each waste management unit. This ground water monitoring system shall include:

(A) for all monitoring and response programs, a sufficient number of background monitoring points installed at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water that has not been affected by a release from the waste management unit;

(B) for a detection monitoring program under section 2550.8 of this article:

1. a sufficient number of monitoring points installed at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water passing the point of compliance and to allow for the detection of a release from the waste management unit;

2. a sufficient number of monitoring points installed at additional locations and depths to yield ground water samples from the uppermost aquifer to provide the best assurance of the earliest possible detection of a release from the waste management unit;

3. a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield ground water samples from portions of the zone of saturation, including other aquifers, not monitored pursuant to subsections (b)(1)(B)1. and (b)(1)(B)2. of this section to provide the best assurance of the earliest possible detection of a release from the waste management unit;

4. a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield ground water samples from zones of perched water to provide the best assurance of the earliest possible detection of a release from the waste management unit; and

5. monitoring point locations and depths that include the zone(s) of highest hydraulic conductivity in each ground water body monitored pursuant to this subsection.

(C) for an evaluation monitoring program under section 2550.9 of this article:

1. a sufficient number of monitoring points installed at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water passing the point of compliance and at other locations in the uppermost aquifer to provide the data needed to evaluate changes in water quality due to the release from the waste management unit;

2. a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield ground water samples from portions of the zone of saturation, including other aquifers, not monitored pursuant to subsection (b)(1)(C)1. of this section to provide the data needed to evaluate changes in water quality due to the release from the waste management unit;

3. a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield ground water samples from zones of perched water to provide the data needed to evaluate changes in water quality due to the release from the waste management unit; and

(D) for a corrective action program under section 2550.10 of this article:

1. a sufficient number of monitoring points installed at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water passing the point of compliance and at other locations in the uppermost aquifer to provide the data needed to evaluate the effectiveness of the corrective action program;

2. a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield ground water samples from portions of the zone of saturation, including other aquifers, not monitored pursuant to subsection (b)(1)(D)1. of this section to provide the data needed to evaluate the effectiveness of the corrective action program; and

3. a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield ground water samples from zones of perched water to provide the data needed to evaluate the effectiveness of the corrective action program.

(2) The ground water monitoring system may include background monitoring points that are not hydraulically upgradient of the waste management unit if the discharger demonstrates to the satisfaction of the regional board that sampling at other monitoring points will provide samples that are representative of the background quality of ground water or are more representative than those provided by the upgradient monitoring points.

(3) Copies of drillers' logs which the Department of Water Resources requires to be submitted pursuant to section 13751 of the California Water Code shall be submitted to the regional board.

(4) All monitoring wells shall be cased and constructed in a manner that maintains the integrity of the monitoring well bore hole and prevents the bore hole from acting as a conduit for contaminant transport.

(5) The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative ground water samples.

(6) For each monitoring well, the annular space (i.e., the space between the bore hole and well casing) above and below the sampling interval shall be appropriately sealed to prevent entry of contaminants from the ground surface, entry of contaminants from the unsaturated zone, cross contamination between portions of the zone of saturation, and contamination of samples.

(7) All monitoring wells shall be adequately developed to enable collection of representative ground water samples.

(c) Surface Water Monitoring Systems.

(1) The discharger shall establish a surface water monitoring system to monitor each surface water body that could be affected by a release from the waste management unit.

(2) Each surface water monitoring system shall include:

(A) a sufficient number of background monitoring points established at appropriate locations and depths to yield samples from each surface water body that represent the quality of surface water that has not been affected by a release from the waste management unit;

(B) for a detection monitoring program under section 2550.8 of this article, a sufficient number of monitoring points established at appropriate locations and depths to yield samples from each surface water body that provide the best assurance of the earliest possible detection of a release from the waste management unit;

(C) for an evaluation monitoring program under section 2550.9 of this article, a sufficient number of monitoring points established at appropriate locations and depths to yield samples from each surface water body that provide the data to evaluate changes in water quality due to the release from the waste management unit; and

(D) for a corrective action program under section 2550.10 of this article, a sufficient number of monitoring points established at appropriate locations and depths to yield samples from each surface water body that provide the data to evaluate compliance with the water quality protection standard and to evaluate the effectiveness of the corrective action program.

(d) Unsaturated Zone Monitoring System.

(1) Except as otherwise provided in subsection (d)(5) of this section, the discharger shall establish an unsaturated zone monitoring system for each waste management unit.

(2) The unsaturated zone monitoring system shall include:

(A) a sufficient number of background monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that represent the quality of soil-pore liquid that has not been affected by a release from the waste management unit;

(B) for a detection monitoring program under section 2550.8 of this article, a sufficient number of monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that provide the best assurance of the earliest possible detection of a release from the waste management unit;

(C) for an evaluation monitoring program under section 2550.9 of this article, a sufficient number of monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that provide the data to evaluate changes in water quality due to the release from the waste management unit; and

(D) for a corrective action program under section 2550.10 of this article, a sufficient number of monitoring points established at appropriate locations and depths to yield soil-pore liquid samples or soil-pore liquid measurements that provide the data to evaluate compliance with the water quality protection standard and to evaluate the effectiveness of the corrective action program.

(3) Background monitoring points shall be installed at a background plot having soil characteristics similar to those of the soil underlying the waste management unit.

(4) Liquid recovery types of unsaturated zone monitoring (e.g., the use of lysimeters) are required unless the discharger demonstrates to the satisfaction of the regional board that such methods of unsaturated zone monitoring cannot provide an indication of a release from the waste management unit. The regional board shall require complimentary or alternative (non-liquid recovery) types of unsaturated zone monitoring to provide the best assurance of the earliest possible detection of a release from the waste management unit.

(5) Unsaturated zone monitoring is required at all new waste management units unless the discharger demonstrates to the satisfaction of the regional board that there is no unsaturated zone monitoring device or method designed to operate under the subsurface conditions existent at that waste management unit. For a waste management unit that has operated or has received all permits necessary for construction and operation before 7-1-91, unsaturated zone monitoring is required unless the discharger demonstrates to the satisfaction of the regional board that either there is no unsaturated zone monitoring device or method designed to operate under the subsurface conditions existent at that waste management unit or that installation of unsaturated zone monitoring devices would require unreasonable dismantling or relocating of permanent structures.

(e) General Monitoring Requirements.

(1) All monitoring systems shall be designed and certified by a registered geologist or a registered civil engineer.

(2) All monitoring wells and all other borings drilled to satisfy the requirements of this article shall be logged during drilling under the direct supervision of a registered geologist. These logs shall be submitted to the regional board upon completion of drilling.

(A) Soil shall be described in the geologic log according to the Unified Soil Classification System as presented in Geotechnical Branch Training Manuals No. 4, 5, and 6, published by the United States Bureau of Reclamation in January of 1986 (available from Bureau of Reclamation, Engineering and Research Center, Attention: Code D-7923-A, P.O. Box 25007, Denver, Colorado 80225).

(B) Rock shall be described in the geologic log in a manner appropriate for the purpose of the investigation.

(C) Where possible, the depth and thickness of saturated zones shall be recorded in the geologic log.

(3) If a facility contains contiguous waste management units, separate ground water monitoring systems are not required for each such unit if the discharger demonstrates to the satisfaction of the regional board that the water quality monitoring program for each unit will enable the earliest possible detection and measurement of a release from that unit.

(4) The water quality monitoring program shall include consistent sampling and analytical procedures that are designed to ensure that monitoring results provide a reliable indication of water quality at all monitoring points and background monitoring points. At a minimum, the program shall include a detailed description of the procedures and techniques for:

(A) sample collection (e.g., purging techniques, sampling equipment, and decontamination of sampling equipment);

(B) sample preservation and shipment;

(C) analytical procedures; and

(D) chain of custody control.

(5) The water quality monitoring program shall include appropriate sampling and analytical methods for ground water, surface water, and the unsaturated zone that accurately measure the concentration of each constituent of concern and the concentration or value of each monitoring parameter.

(6) For each waste management unit, the discharger shall collect all data necessary for selecting the appropriate statistical methods pursuant to subsections (e)(7), (e)(8), and (e)(9) of this section and for establishing the background values specified pursuant to subsection (e)(11) of this section. At a minimum, this data shall include analytical data obtained during quarterly sampling of all background monitoring points for a period of one year, including the times of expected highest and lowest annual elevations of the ground water surface. For a new waste management unit, this data shall be collected before wastes are discharged at the unit and background soil-pore liquid data shall be collected from beneath the unit before the unit is constructed.

(7) Based on data collected pursuant to subsection (e)(6) of this section, the discharger shall propose one of the statistical methods specified in subsection (e)(8) of this section for each constituent of concern and for each monitoring parameter. These methods, upon approval by the regional board, shall be specified in the waste discharge requirements and shall be used in evaluating water quality monitoring data. The specifications for each statistical method shall include a detailed description of the criteria to be used for determining statistically significant evidence of any release from the waste management unit and for determining compliance with the water quality protection standard. Each statistical test specified for a particular constituent of concern or monitoring parameter shall be conducted separately for that constituent of concern or monitoring parameter at each monitoring point. Where practical quantitation limits are used in any of the following statistical methods to comply with subsection (e)(9)(E) of this section, the practical quantitation limit shall be proposed by the discharger for approval by the regional board. The discharger shall demonstrate that use of the proposed statistical methods will comply with the performance standards outlined in subsection (e)(9) of this section.

(8) The discharger shall propose one of the following statistical methods:

(A) a parametric analysis of variance (ANOVA) followed in all instances by a multiple comparisons procedure to identify statistically significant evidence of a release from the waste management unit. The method shall include estimation and testing of the contrasts between each monitoring point's mean and the background mean value for each constituent or parameter;

(B) an ANOVA based on ranks followed in all instances by a multiple comparisons procedure to identify statistically significant evidence of a release from the waste management unit. The method shall include estimation and testing of the contrasts between each monitoring point's median and the background median values for each constituent of concern or monitoring parameter;

(C) a tolerance or prediction interval procedure in which an interval for each constituent of concern or monitoring parameter is established from the distribution of the background data, and the value for each constituent of concern or monitoring parameter at each monitoring point is compared to the upper tolerance or prediction limit;

(D) a control chart approach that gives control limits for each constituent of concern or monitoring parameter;
or

(E) any statistical test method submitted by the discharger for approval by the regional board including, but not limited to, any statistical method which includes a procedure to verify that there is statistically significant evidence of a release from the waste management unit. If the statistical test method includes a verification procedure, this procedure shall include either a single "composite" retest (i.e., a statistical analysis that augments and reanalyzes the data from the monitoring point that indicated a release) or shall consist of at least two "discrete" retests (i.e., statistical analyses each of which analyzes only newly-acquired data from the

monitoring point that indicated a release). The verification procedure shall comply with the following requirements in addition to the statistical performance standards under subsection (e)(9) of this section:

1. if the verification procedure consists of discrete retests, rejection of the null hypothesis for any one of the retests shall be considered confirmation of significant evidence of a release;
2. the number of additional samples collected and analyzed for use in the verification procedure shall be appropriate for the form of statistical test specified in the waste discharge requirements for that constituent of concern or monitoring parameter pursuant to subsection (e)(7) of this section. The number of additional samples shall be greater than or equal to the number of samples specified in the waste discharge requirements for that constituent or parameter pursuant to subsection (e)(12)(A) of this section;
3. if resampling at the interval identified for use in the initial statistical test pursuant to subsection (e)(12)(B) of this section would cause the entire resampling effort to take longer than 30 days, the sampling interval for use in the verification procedure shall be reduced to ensure that all samples are collected and submitted for laboratory analysis within 30 calendar days from the time that the discharger determines statistically significant evidence of a release pursuant to subsection 2550.8(g) or (i) of this article;
4. for a verification procedure containing a composite retest, the statistical verification procedure shall be based on all data obtained from the initial sampling event combined with all data obtained during the resampling event. For a verification procedure containing discrete retests, each retest shall analyze data obtained during its respective resampling event(s) and no data shall be shared between retests;
5. the Type I error for statistical methods employing a retest procedure shall be as follows:
 - a. for a verification procedure containing a composite retest, the statistical test method used shall be the same as the method used in the initial statistical comparison, except that the statistical test used in the verification procedure shall be conducted at a Type I error rate of no less than 0.05 for both the experiment-wise analysis (if any) and the individual monitoring point comparisons. Therefore, if a control chart approach is used to evaluate water quality monitoring data, the upper limit on an X-Bar or R-Chart must be set at no more than 1.645 standard deviations of the statistic plotted for a one-sided statistical comparison or at no more than 1.96 standard deviations of the statistic plotted for a two-sided statistical comparison;
 - b. For a verification procedure containing discrete retests, the statistical test method used shall be the same as the method used in the initial statistical comparison. Notwithstanding any provision of subsection (e)(9) of this section, the critical value for the tests shall be chosen so that the Type I error rate for all individual monitoring point comparisons is the same, whether for an initial test or for a retest, and is equal-to-or-greater-than either

$$(1-[0.95]^{1/[M*W*S]})^{0.5} * (1/R)^{0.5}, \text{ or}$$

$$1-(0.99)^{1/S},$$

whichever is larger, where: M= the number of monitoring parameters; W = the number of monitoring points at the waste management unit; S = the number of times that suites of monitoring data from the waste management unit are subjected to initial statistical analysis within a period of six months (i.e., S \geq 1); and R = the number of discrete retests that are to be conducted at a monitoring point whose initial statistical analysis for a given constituent of concern or monitoring parameter has indicated the presence of a release (i.e., R \geq 2);

6. the discharger shall report to the regional board by certified mail the results of both the initial statistical test and the results of the verification procedure, as well as all concentration data collected for use in these tests within seven days of the last laboratory analysis of the samples collected for the verification procedure; and

7. the verification procedure shall only be performed for the constituent(s) which has shown statistically significant evidence of a release, and shall be performed for those monitoring points at which a release is indicated.

(9) Each statistical method chosen under subsection 2550.7(e)(7) of this article for specification in the waste discharge requirements shall comply with the following performance standards for each six-month period:

(A) the statistical method used to evaluate water quality monitoring data shall be appropriate for the distribution of the constituent of concern or monitoring parameter to which it is applied and shall be the least likely of the appropriate methods to fail to identify a release from the waste management unit. If the distribution of a constituent of concern or monitoring parameter is shown by the discharger to be inappropriate for a normal theory test, then the data shall be either transformed so that the distribution of the transformed data is appropriate for a normal theory test or a distribution-free theory test shall be used. If the distributions for the constituents of concern or monitoring parameters differ, more than one statistical method may be needed;

(B) if an individual monitoring point comparison procedure is used to compare an individual monitoring point constituent concentration or monitoring parameter value with a concentration limit in the water quality protection standard or with a background monitoring parameter value, the test shall be done at a Type I error rate no less than 0.01. If a multiple comparisons procedure is used, the Type I experiment-wise error rate shall be no less than 0.05; however, a Type I error rate of no less than 0.01 for individual monitoring point comparisons shall be maintained. This performance standard does not apply to tolerance intervals, prediction intervals, or control charts;

(C) if a control chart approach is used to evaluate water quality monitoring data, the specific type of control chart and its associated statistical parameter values (e.g., the upper control limit) shall be proposed by the discharger and submitted for approval by the regional board. The regional board may approve the procedure only if it finds the procedure to be protective of human health and the environment. Any control charting procedure must have a false-positive rate of no less than 1 percent for each monitoring point charted (e.g., upper control limits on X-bar or R-Charts used only once every six months must be set at no more than 2.327 standard deviations of the statistic plotted for a one-sided statistical comparison or at no more than 2.576 standard deviations of the statistic plotted for a two-sided statistical comparison);

(D) if a tolerance interval or a prediction interval is used to evaluate water quality monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain shall be proposed by the discharger and submitted for approval by the regional board. The regional board may approve the parameters only if it finds these statistical parameters to be protective of human health and the environment. These statistical parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentrations or values for each constituent of concern or monitoring parameter. The coverage of any tolerance interval used shall be no more than 95 percent and the confidence coefficient shall be no more than 95 percent for a six-month period. Prediction intervals shall be constructed with an experiment-wise error rate of no less than 5 percent and an individual monitoring point error rate of no less than 1 percent;

(E) the statistical method shall account for data below the practical quantitation limit with one or more statistical procedures that are protective of human health and the environment. Any practical quantitation limit approved by the regional board pursuant to subsection (e)(7) of this section that is used in the statistical method shall be the lowest concentration (or value) that can be reliably achieved within limits of precision and accuracy specified in the waste discharge requirements for routine laboratory operating conditions that are available to the facility. The regional board shall consider the practical quantitation limits listed in Appendix IX to Chapter

14 of Division 4.5 of Title 22, California Code of Regulations (Appendix IX) for guidance when specifying limits of precision and accuracy in the waste discharge requirements;

(F) if necessary, the statistical methods shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data; and

(G) any quality control procedure that is approved by the regional board for application to water quality data from downgradient monitoring points for a monitored medium shall also be applied to all newly-acquired background data from that medium. Any newly-acquired background monitoring datum that is rejected by an approved quality control procedure shall be maintained in the facility record but shall be excluded from use in statistical comparisons with downgradient water quality data.

(10) Based on the data collected pursuant to subsection (e)(6) of this section and the statistical methods proposed under subsection (e)(7) of this section, the discharger shall propose and justify the use of a procedure for determining a background value for each constituent of concern and for each monitoring parameter specified in the waste discharge requirements. These procedures shall be proposed for ground water, surface water, and the unsaturated zone. The discharger shall propose one of the following for approval by the regional board:

(A) a procedure for determining a background value for each constituent or parameter that does not display appreciable variation; or

(B) a procedure for establishing and updating a background value for a constituent or parameter to reflect changes in the background water quality if the use of contemporaneous or pooled data provides the greatest power to the statistical method for that constituent or parameter.

(11) Upon approval of the procedures for determining background values, proposed pursuant to subsection (e)(10) of this section, the regional board shall specify in the waste discharge requirements one of the following for each constituent of concern and for each monitoring parameter:

(A) a background value established by the discharger using the procedure proposed pursuant to subsection (e)(10)(A) of this section; or

(B) a detailed description of the procedure to be used by the discharger for establishing and updating a background value as proposed pursuant to subsection (e)(10)(B) of this section.

(12) For each constituent of concern and monitoring parameter listed in the waste discharge requirements, the discharger shall propose, for approval by the regional board, the sampling methods to be used to establish background values and the sampling methods to be used for monitoring pursuant to this article. Upon approval by the regional board, sampling methods consistent with the following shall be specified in waste discharge requirements:

(A) the number and kinds of samples collected shall be appropriate for the form of statistical test employed, following generally accepted statistical principles. The sample size shall be as large as necessary to ensure with reasonable confidence that:

1. for a detection monitoring program, a release from the waste management unit will be detected;
2. for an evaluation monitoring program, changes in water quality due to a release from the waste management unit will be recognized; and
3. for a corrective action program, compliance with the water quality protection standard and effectiveness of the corrective action program will be determined; and

(B) the sampling method (including the sampling frequency and the interval of time between successive samples) shall be appropriate for the medium from which samples are taken (e.g., ground water, surface water, and soil-pore liquid). For ground water, sampling shall be scheduled to include the times of expected highest and lowest elevations of the potentiometric surface. The sampling method shall assure, to the greatest extent possible, that independent samples are obtained. In addition to any pre-sampling purge prescribed in the sampling and analysis plan, ground water monitoring wells shall be purged immediately after sampling is completed in order to remove all residual water that was in the well bore during the sampling event so as to assure the independence of samples from successive sampling events. The volume of well water to be withdrawn from the well bore for the post-sampling purge shall be determined by the same method used to determine adequate pre-sampling purging. The sampling method selected shall include either:

1. a sequence of at least four samples collected at least semi-annually from each monitoring point and background monitoring point and statistical analysis carried out at least semi-annually. The regional board shall require more frequent sampling and statistical analysis where necessary to protect human health or the environment; or
2. not less than one sample collected quarterly from each monitoring point and background monitoring point and statistical analysis performed at least quarterly.

(13) The ground water portion of the monitoring program shall include an accurate determination of the ground water surface elevation and field parameters (temperature, electrical conductivity, turbidity, and pH) at each well each time ground water is sampled.

(14) The discharger shall graph all analytical data from each monitoring point and background monitoring point and shall submit these graphs to the regional board at least once annually, except that graphs are not required for constituents for which no new data has been collected since the previous graph submittal. Graphs shall be at a scale appropriate to show trends or variations in water quality. All graphs for a given constituent shall be plotted at the same scale to facilitate visual comparison of monitoring data. Unless the discharger receives written approval from the regional board to use an alternate procedure that more effectively illustrates trends or variations in the data, each graph shall represent data from one monitoring point or background monitoring point and one constituent of concern or monitoring parameter.

(15) In addition to the water quality sampling conducted pursuant to the requirements of this article, the discharger shall measure the water level in each well and determine ground water flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored pursuant to subsection (b)(1) of this section at least quarterly, including the times of expected highest and lowest elevations of the water levels in the wells.

(16) Water quality monitoring data collected in accordance with this article, including actual values of constituents and parameters, shall be maintained in the facility operating record. The regional board shall specify in the waste discharge requirements when the data shall be submitted for review.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, and 13267, Water Code.

§2550.8. Detection Monitoring Program.

(a) A discharger required, pursuant to section 2550.1 of this article, to establish a detection monitoring program for a waste management unit shall, at a minimum, comply with the requirements of this section for that unit.

(b) The discharger shall install water quality monitoring systems that are appropriate for detection monitoring and that comply with the provisions of section 2550.7 of this article.

(c) The discharger shall establish a background value pursuant to subsection 2550.7(e)(11) of this article for each monitoring parameter specified pursuant to subsection (e) of this section and for each constituent of concern under section 2550.3 of this article.

(d) The regional board shall specify the water quality protection standard under section 2550.2 of this article in the waste discharge requirements.

(e) The discharger shall propose for approval by the regional board a list of monitoring parameters for each medium (ground water, surface water, and the unsaturated zone) to be monitored pursuant to section 2550.7 of this article. The list for each medium shall include those physical parameters, hazardous constituents, waste constituents, and reaction products that provide a reliable indication of a release from the waste management unit to that medium. The regional board shall specify each list of monitoring parameters in the waste discharge requirements after considering the following factors:

- (1) the types, quantities, and concentrations of constituents in wastes managed at the waste management unit;
- (2) the expected or demonstrated correlation between the proposed monitoring parameters and the constituents of concern specified for the unit under section 2550.3 of this article;
- (3) the mobility, stability, and persistence of waste constituents or their reaction products;
- (4) the detectability of physical parameters, waste constituents, and reaction products; and
- (5) the background values and the coefficients of variation of proposed monitoring parameters in ground water, surface water, and the unsaturated zone.

(f) The discharger shall monitor for the monitoring parameters listed in the waste discharge requirements pursuant to subsection (e) of this section. The regional board shall specify the frequencies for collecting samples and conducting statistical analyses, pursuant to subsection 2550.7(e)(12) of this article.

(g) In addition to monitoring for the monitoring parameters specified pursuant to subsection (e) of this section, the discharger shall periodically monitor for all constituents of concern specified in the waste discharge requirements and determine whether there is statistically significant evidence of a release for any constituent of concern using the statistical procedure specified pursuant to subsection 2550.7(e)(7) of this article. The regional board shall specify in waste discharge requirements the frequencies and locations for monitoring pursuant to this subsection after considering the degree of certainty associated with the expected or demonstrated correlation between values for monitoring parameters and values for the constituents of concern. Monitoring pursuant to this subsection shall be conducted at least every five years.

(h) The discharger shall maintain a record of water quality analytical data as measured and in a form necessary for the determination of statistical significance pursuant to subsections (g) and (i) of this section.

(i) For each monitoring point, the discharger shall determine whether there is statistically significant evidence of a release from the waste management unit for any monitoring parameter specified in the waste discharge requirements pursuant to subsection (e) of this section at a frequency specified pursuant to subsection (f) of this section.

(1) In determining whether statistically significant evidence of a release from the waste management unit exists, the discharger shall use the method(s) specified in the waste discharge requirements pursuant to subsection 2550.7(e)(7) of this article. This method(s) shall be used to compare data collected at the monitoring point(s) with the background water quality data.

(2) The discharger shall determine whether there is statistically significant evidence of a release from the waste management unit at each monitoring point within a reasonable period of time after completion of sampling. The regional board shall specify in the waste discharge requirements what period of time is reasonable after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of samples.

(3) The provisions of this section shall not preclude the regional board from making an independent finding that there is statistically significant evidence of a release from the waste management unit. If the regional board makes such a finding, the discharger shall comply with the provisions of this section that are required in response to statistically significant evidence of a release from the waste management unit.

(j) If the discharger determines pursuant to subsection (g) or (i) of this section that there is evidence of a release from the waste management unit, the discharger:

(1) shall immediately notify regional board staff verbally of the finding and shall provide written notification by certified mail within seven days of such determination. The notification shall, for each affected monitoring point, identify the monitoring parameters and constituents of concern that have indicated statistically significant evidence of a release from the waste management unit; and

(2) may immediately initiate the verification procedure pre-approved by the regional board, pursuant to subsection 2550.7(e)(8)(E) of this article, to verify that there is statistically significant evidence of a release from the waste management unit for a parameter or constituent which has indicated a release at a monitoring point.

(k) If a verification procedure, performed pursuant to subsection (j)(2) of this section, confirms that there is statistically significant evidence of a release from the waste management unit or if the discharger does not resample the discharger shall perform the following:

- (1) immediately sample all monitoring points in the affected medium at that waste management unit and determine the concentration of all constituents of concern;
- (2) immediately sample all monitoring points for that waste management unit in the affected medium (ground water, surface water, or the unsaturated zone) and determine whether constituents in the list of Appendix IX to Chapter 14 of Division 4.5 of Title 22, California Code of Regulations (Appendix IX) are present, and if so, in what concentration(s);
- (3) for any Appendix IX constituents found at a monitoring point, pursuant to subsection (k)(2) of this section, that are not found in comparable concentrations to those exhibited at the background monitoring points for that waste management unit and that are not specified in the list of constituents of concern for that unit, the discharger may resample within one month and repeat the analysis for those constituents. Any constituent detected in both analyses shall be added to the list of constituents of concern specified in the waste discharge requirements for evaluation monitoring. If the discharger does not resample for the constituents found pursuant to subsection (k)(2) of this section, each constituent found during the initial analysis shall be added to the list of constituents of concern specified in the waste discharge requirements for evaluation monitoring unless the discharger can demonstrate to the satisfaction of the regional board that the concentration at which the constituent is found at the monitoring point is comparable to the concentration it exhibits at the background monitoring points for that unit;
- (4) for each Appendix IX constituent added to the list of constituents of concern pursuant to subsection (k)(3) of this section, the discharger shall:
 - (A) collect all data necessary for establishing the background concentration for that constituent and for selecting an appropriate statistical procedure pursuant to subsection 2550.7(e)(6) of this article;
 - (B) propose an appropriate statistical procedure pursuant to subsection 2550.7(e)(7) of this article;
 - (C) propose a procedure to establish the background concentration for that constituent pursuant to subsection 2550.7(e)(10) of this article; and
 - (D) establish the background concentration pursuant to subsection 2550.7(e)(11) of this article;
- (5) within 90 days of determining statistically significant evidence of a release, submit to the regional board an amended report of waste discharge to establish an evaluation monitoring program meeting the provisions of section 2550.9 of this article. The report shall include the following information:
 - (A) the maximum concentration of each constituent of concern at each monitoring point as determined during the most recent sampling events, and an identification of the concentration of each Appendix IX constituent at each monitoring point for that unit in the affected medium (ground water, surface water, or the unsaturated zone);
 - (B) any proposed changes to the water quality monitoring systems at the waste management unit necessary to meet the provisions of section 2550.9 of this article;
 - (C) any proposed additions or changes to the monitoring frequency, sampling and analytical procedures or methods, or statistical methods used at the waste management unit necessary to meet the provisions of section 2550.9 of this article; and
 - (D) a detailed description of the measures to be taken by the discharger to assess the nature and extent of the release from the waste management unit;
- (6) within 180 days of determining statistically evidence of a release, submit to the regional board an engineering feasibility study for a corrective action program necessary to meet the requirements of section 2550.10 of this article. At a minimum, the feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern; and

(7) if the discharger determines, pursuant to subsections (g) or (i) of this section, that there is statistically significant evidence of a release from the waste management unit at any monitoring point, the discharger may demonstrate that a source other than the waste management unit caused the evidence of a release or that the evidence is an artifact caused by an error in sampling, analysis, or statistical evaluation or by natural variation in the ground water, surface water, or the unsaturated zone. The discharger may make a demonstration pursuant to this subsection in addition to or in lieu of submitting both an amended report of waste discharge pursuant to subsection (k)(5) of this section and an engineering feasibility study pursuant to subsection (k)(6) of this section; however, the discharger is not relieved of the requirements specified in subsections (k)(5) and (k)(6) of this section unless the demonstration made pursuant to this subsection successfully shows that a source other than the waste management unit caused the evidence of a release or that the evidence resulted from error in sampling, analysis, or evaluation, or from natural variation in ground water, surface water, or the unsaturated zone. In making a demonstration pursuant to this subsection, the discharger shall:

(A) within seven days of determining statistically significant evidence of a release, notify the regional board by certified mail that the discharger intends to make a demonstration pursuant to this subsection;

(B) within 90 days of determining statistically significant evidence of a release, submit a report to the regional board that demonstrates that a source other than the waste management unit caused the evidence, or that the evidence resulted from error in sampling, analysis, or evaluation, or from natural variation in ground water, surface water, or the unsaturated zone;

(C) within 90 days of determining statistically significant evidence of a release, submit to the regional board an amended report of waste discharge to make any appropriate changes to the detection monitoring program; and

(D) continue to monitor in accordance with the detection monitoring program established pursuant to this section.

(l) If the discharger determines that there is significant physical evidence of a release as described in subsection 2550.1(a)(3) of this article or that the detection monitoring program does not satisfy the requirements of this section, the discharger shall:

(1) notify the regional board by certified mail within 7 days of such determination; and

(2) within 90 days of such determination, submit an amended report of waste discharge to make any appropriate changes to the program.

(m) Any time the regional board determines that the detection monitoring program does not satisfy the requirements of this section the regional board shall send written notification of such determination to the discharger by certified mail, return receipt requested; the discharger shall, within 90 days after receipt of such notification by the regional board, submit an amended report of waste discharge to make any appropriate changes to the program.

(n) For any Class I waste management unit for which a detection monitoring program is established after the successful completion of a corrective action program pursuant to subsection 2550.10(g) of this article:

(1) the regional board shall include in the list of monitoring parameters for each medium (ground water, surface water, and the unsaturated zone) all hazardous constituents that have been detected in that medium due to a release from that waste management unit; and

(2) the discharger shall analyze samples from all ground water monitoring points at the point of compliance for that waste management unit and determine the concentration of each constituent contained in Appendix IX at least annually during any remaining years of the compliance period. If the discharger finds either an Appendix IX constituent at a concentration above the concentration limit established in the waste discharge requirements for that constituent or one that is not already identified in the waste discharge requirements as a monitoring parameter, the discharger may resample within one month of the original sample and repeat the analysis for those constituents. If the discharger does not resample or if the resampling confirms that the concentration limit for a constituent has been exceeded or that a new constituent is present:

(A) the discharger shall report the concentration of these constituents to the regional board within seven days of the latest analysis;

(B) the regional board shall add each such constituent to the list of monitoring parameters that are specified in the waste discharge requirements for ground water, unless the discharger demonstrates to the satisfaction of the regional board that the concentration of that constituent at the monitoring point is comparable to the concentration it exhibits at the background monitoring points for that unit; and

(C) if a constituent is added to the list of monitoring parameters, pursuant to subsection (n)(2)(B) of this section, the discharger shall immediately collect samples and conduct statistical tests for each monitoring parameter to determine whether there is statistically significant evidence of a release from the unit.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, and 13267, Water Code.

§2550.9. Evaluation Monitoring Program.

(a) A discharger required pursuant to section 2550.1 of this article to establish an evaluation monitoring program for a waste management unit shall, at a minimum, comply with the requirements of this section for that unit. The evaluation monitoring program shall be used to assess the nature and extent of the release from the waste management unit and to design a corrective action program meeting the requirements of section 2550.10 of this article.

(b) The discharger shall collect and analyze all data necessary to assess the nature and extent of the release from the waste management unit. This assessment shall include a determination of the spacial distribution and concentration of each constituent of concern throughout the zone affected by the release. The discharger shall complete and submit this assessment within 90 days of establishing an evaluation monitoring program.

(c) Based on the data collected pursuant to subsections (b) and (e) of this section, the discharger shall update the engineering feasibility study for corrective action required pursuant to subsection 2550.8(k)(6) of this article. The discharger shall submit this engineering feasibility study to the regional board within 90 days of establishing an evaluation monitoring program.

(d) Based on the data collected pursuant subsection (b) of this section and on the engineering feasibility study submitted pursuant to Subsection (c) of this section, the discharger shall submit an amended report of waste discharge to establish a corrective action program meeting the requirements of section 2550.10 of this article. The discharger shall submit this report to the regional board within 90 days of establishing an evaluation monitoring program. This report shall at a minimum include the following information:

- (1) a detailed assessment of the nature and extent of the release from the waste management unit;
- (2) a proposed water quality protection standard, including any proposed concentration limits greater than background under section 2550.4 of this article, and all data necessary to justify each such limit;

(3) a detailed description of proposed corrective action measures that will be taken to achieve compliance with the water quality protection standard proposed for a corrective action program; and

(4) a plan for a water quality monitoring program that will demonstrate the effectiveness of the proposed corrective action.

(e) In conjunction with the assessment conducted pursuant to subsection (b) of this section, and while awaiting final approval of the amended report of waste discharge, submitted pursuant to subsection (d) of this section, the discharger shall monitor ground water, surface water, and the unsaturated zone to evaluate changes in water quality resulting from the release from the waste management unit. In conducting this monitoring, the discharger shall comply with the following requirements:

(1) the discharger shall install water quality monitoring systems that are appropriate for evaluation monitoring and that comply with the provisions of section 2550.7 of this article. These water quality monitoring systems may include all or part of existing monitoring systems;

(2) the discharger shall propose for approval by the regional board a list of monitoring parameters for each medium (ground water, surface water, and the unsaturated zone) to be monitored pursuant to section 2550.7 of this article. The list for each medium shall include all hazardous constituents that have been detected in that medium and those physical parameters, waste constituents, and reaction products that provide a reliable indication of changes in water quality resulting from any release from the waste management unit to that medium. The regional board shall specify each list of monitoring parameters in the waste discharge requirements after considering the following factors:

(A) the types, quantities, and concentrations of constituents in wastes managed at the waste management unit;

(B) information that demonstrates, to the satisfaction of the regional board, a sufficient correlation between the proposed monitoring parameters and the constituents of concern specified for the unit;

(C) the mobility, stability, and persistence of waste constituents or their reaction products;

(D) the detectability of physical parameters, waste constituents, and reaction products; and

(E) the background values and the coefficients of variation of proposed monitoring parameters in ground water, surface water, and the unsaturated zone;

(3) the discharger shall monitor for the monitoring parameters listed in the waste discharge requirements pursuant to subsection (e)(2) of this section. The regional board shall specify in the waste discharge requirements the frequencies for collecting samples and for conducting statistical analyses pursuant to subsection 2550.7(e)(12) of this article to evaluate changes in water quality due to the release from the waste management unit;

(4) in addition to monitoring for the monitoring parameters specified pursuant to subsection (e)(2) of this section, the discharger shall periodically monitor for all constituents of concern specified in the waste discharge requirements and evaluate changes in water quality due to the release from the waste management unit. The regional board shall specify the frequencies for monitoring pursuant to this subsection after considering the degree of certainty associated with the demonstrated correlation between values for monitoring parameters and values for the constituents of concern;

(5) the discharger shall conduct water quality monitoring for each monitoring parameter and each constituent of concern in accordance with subsection 2550.7(e)(12) of this article. The discharger shall maintain a record of water quality analytical data as measured and in a form necessary for the evaluation of changes in water quality due to a release from the waste management unit;

(6) the discharger shall analyze samples from all monitoring points in the affected medium for all constituents contained in Appendix IX to Chapter 14 of Division 4.5 of Title 22, California Code of Regulations (**Appendix IX**) at least annually to determine whether additional hazardous constituents are present and, if so,

at what concentration(s). If the discharger finds Appendix IX constituents in the ground water, surface water, or the unsaturated zone that are not already identified in the waste discharge requirements as constituents of concern, the discharger may resample within one month and repeat the analysis for those constituents. If the second analysis confirms the presence of new constituents, the discharger shall report the concentration of these additional constituents to the regional board by certified mail within seven days after the completion of the second analysis and the regional board shall add them to the list of constituents of concern specified in the waste discharge requirements unless the discharger demonstrates to the satisfaction of the regional board that the constituent is not reasonably expected to be in or derived from waste in the waste management unit. If the discharger does not resample, then the discharger shall report the concentrations of these additional constituents to the regional board by certified mail within seven days after completion of the initial analysis and the regional board shall add them to the list of constituents of concern specified in the waste discharge requirements unless the discharger demonstrates to the satisfaction of the regional board that the constituent is not reasonably expected to be in or derived from waste in the waste management unit; and

(7) while awaiting final approval of an amended report of waste discharge to establish a corrective action program, the discharger shall evaluate all water quality data obtained pursuant to subsection (e) of this section with respect to the design criteria for the corrective action program. If the evaluation indicates that the plan for corrective action is insufficient, the discharger shall:

(A) notify the regional board by certified mail within 7 days of such determination; and

(B) within 90 days of such determination, submit for approval by the regional board any appropriate changes to the amended report of waste discharge.

(f) The discharger may demonstrate that a source other than the waste management unit caused the evidence of a release or that the evidence is an artifact caused by an error in sampling, analysis, or statistical evaluation, or by natural variation in ground water, surface water, or the unsaturated zone. Upon a successful demonstration the regional board shall specify that the discharger shall reinstitute a detection monitoring program meeting the requirements of section 2550.8 of this article. In making a demonstration under this subsection, the discharger shall:

(1) notify the regional board by certified mail that the discharger intends to make a demonstration pursuant to this subsection;

(2) submit a report to the regional board that demonstrates that a source other than the waste management unit caused the evidence of a release or that the evidence resulted from error in sampling, analysis, or evaluation, or from natural variation in ground water, surface water, or the unsaturated zone;

(3) submit to the regional board an amended report of waste discharge to reinstitute a detection monitoring program for the unit. This report shall propose all appropriate changes to the monitoring program; and

(4) continue to monitor in accordance with the evaluation monitoring program established pursuant to this section.

(g) The regional board shall require interim corrective action measures where necessary to protect human health or the environment.

(h) If the discharger determines that the evaluation monitoring program does not satisfy the requirements of this section, the discharger shall, within 90 days, submit an amended report of waste discharge to make any appropriate changes to the program.

(i) Any time the regional board determines that the evaluation monitoring program does not satisfy the requirements of this section, the regional board shall send written notification of such determination to the discharger by certified mail, return receipt requested. The discharger shall, within 90 days of such notification by the regional board, submit an amended report of waste discharge to make appropriate changes to the program.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, 13267, and 13304 Water Code.

§2550.10. Corrective Action Program.

(a) A discharger required pursuant to section 2550.1 of this article to establish a corrective action program for a waste management unit shall, at a minimum, comply with the requirements of this section for that unit.

(b) The discharger shall take corrective action to remediate releases from the waste management unit and to ensure that the waste management unit achieves compliance with the water quality protection standard under section 2550.2 of this article. The regional board shall specify the water quality protection standard for corrective action in the waste discharge requirements.

(c) The discharger shall implement corrective action measures that ensure that constituents of concern achieve their respective concentration limits at all monitoring points and throughout the zone affected by the release, including any portions thereof that extend beyond the facility boundary, by removing the waste constituents or treating them in place. The discharger shall take other action approved by the regional board to prevent noncompliance with those limits due to a continued or subsequent release from the waste management unit, including but not limited to, source control. The waste discharge requirements shall specify the specific measures that will be taken.

(d) In conjunction with the corrective action measures, the discharger shall establish and implement a water quality monitoring program to demonstrate the effectiveness of the corrective action program. Such a monitoring program may be based on the requirements for an evaluation monitoring program under section 2550.9 of this article, and shall be effective in determining compliance with the water quality protection standard under section 2550.2 of this article and in determining the success of the corrective action measures pursuant to subsection (c) of this section.

(e) Corrective action measures taken pursuant to this section shall be initiated and completed by the discharger within a period of time specified by the regional board in the waste discharge requirements.

(f) Corrective action measures taken pursuant to subsection (c) of this section may be terminated when the discharger demonstrates to the satisfaction of the regional board that the concentrations of all constituents of concern are reduced to levels below their respective concentration limits.

(g) After suspending the corrective action measures, pursuant to subsection (f) of this section, the waste management unit shall remain in the Corrective Action Program until an approved Detection Monitoring Program meeting the requirements of section 2550.8 of this article has been incorporated into waste discharge requirements and until the discharger demonstrates to the satisfaction of the regional board that the waste management unit is in compliance with the water quality protection standard. This demonstration shall be based on the following criteria and requirements:

(1) the concentration of each constituent of concern in each sample from each monitoring point in the Corrective Action Program for the waste management unit must have remained at or below its respective concentration limit during a proof period of at least one year, beginning immediately after the suspension of corrective action measures; and

(2) the individual sampling events for each monitoring point must have been evenly distributed throughout the proof period and have consisted of no less than eight sampling events per year per monitoring point.

(h) The discharger shall report, in writing, to the regional board on the effectiveness of the corrective action program. The discharger shall submit these reports at least semi-annually. More frequent reporting shall be required by the regional board as necessary to ensure the protection of human health or the environment.

(i) If the discharger determines that the corrective action program does not satisfy the provisions of this section, the discharger shall, within 90 days of making the determination, submit an amended report of waste discharge to make appropriate changes to the program.

(j) Any time the regional board determines that the corrective action program does not satisfy the requirements of this section, the discharger shall, within 90 days of receiving written notification of such determination by the regional board, submit an amended report of waste discharge to make appropriate changes to the program.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, 13267, and 13304 Water Code.

§2550.11. Unsaturated Zone Monitoring and Response Provisions for Class I Land Treatment Units.

(a) A discharger required pursuant to the provisions of this article to conduct unsaturated zone monitoring at a land treatment unit shall comply with the unsaturated zone monitoring and response provisions of this section in conjunction with all other unsaturated zone monitoring and response provisions of this article.

(b) The discharger shall monitor the soil and soil-pore liquid to determine whether constituents of concern migrate out of the treatment zone.

(c) The regional board shall specify the monitoring parameters and constituents of concern to be monitored in the waste discharge requirements. The monitoring parameters to be monitored are those specified pursuant to subsection 2550.8(e) of this article for detection monitoring and subsection 2550.9(e)(2) of this article for evaluation monitoring. The constituents of concern to be monitored are those specified in the water quality protection standard specified for each monitoring and response program. The constituents of concern to be monitored shall include the constituents, including hazardous constituents, that must be degraded, transformed, or immobilized in the treatment zone of the land treatment unit.

(d) The regional board may require monitoring for principal hazardous constituents (PHCs) in lieu of the constituents specified under subsection (c) of this section. PHCs are hazardous constituents contained in the wastes to be applied at the unit that are the most difficult to treat considering the combined effects of degradation, transformation, and immobilization. The regional board may establish PHCs if the regional board finds based on waste analyses, treatment demonstrations, or other data that effective degradation, transformation, or immobilization of the PHCs will assure treatment to at least equivalent levels for the other hazardous constituents in the wastes.

(e) The discharger shall install an unsaturated zone monitoring system that includes soil monitoring using soil cores and soil-pore liquid monitoring using appropriate devices such as lysimeters capable of acquiring soil-pore liquid samples. The unsaturated zone monitoring system shall consist of a sufficient number of sampling points at appropriate locations and depths to yield samples that:

(1) represent the quality of background soil-pore liquid quality and the chemical makeup of soil that has not been affected by a release from the treatment zone; and

(2) indicate the quality of soil-pore liquid and the chemical makeup of the soil below the treatment zone.

(f) The discharger shall establish a background value for each monitoring parameter and each constituent of concern to be monitored under subsection (c) of this section. The discharger shall propose, for approval by the

regional board, the background values for each monitoring parameter and each constituent of concern or the procedures to be used to calculate the background values according to the provisions of subsection 2550.7(e)(10) of this article. The regional board shall specify the background values or procedures in waste discharge requirements according to subsection 2550.7(e)(11) of this article.

(g) Background soil values may be based on a one-time sampling at a background plot having characteristics similar to those of the treatment zone. For new land treatment units, background soil values shall include data from sampling at the proposed plot for the unit.

(h) Background soil-pore liquid values shall be based on at least quarterly sampling for one year at a background plot having characteristics similar to those of the treatment zone. For new land treatment units, background soil-pore liquid values shall include data from sampling at the proposed plot for the unit.

(i) The discharger shall express all background values in a form necessary for the determination of statistically significant increases pursuant to subsection (n) of this section.

(j) In taking samples used in the determination of all background values, the discharger shall use an unsaturated zone monitoring system that complies with subsection (e)(1) of this section.

(k) The discharger shall conduct soil monitoring and soil-pore liquid monitoring immediately below the treatment zone. The regional board shall specify the frequency and timing of soil and soil-pore liquid monitoring in the waste discharge requirements after considering all other monitoring provisions of this article, the frequency, timing, and rate of waste application, the soil permeability, and the maximum anticipated rate of migration. The discharger shall express the results of soil and soil-pore liquid monitoring in a form necessary for the determination of statistically significant increases pursuant to subsection (n) of this section.

(l) The discharger shall propose, for approval by the regional board, consistent sampling and analysis procedures that are designed to ensure sampling results that provide a reliable indication of soil-pore liquid quality and the chemical makeup of the soil below the treatment zone. At a minimum, the discharger shall implement the approved procedures and techniques for:

- (1) sample collection;
- (2) sample preservation and shipment;
- (3) analytical procedures; and
- (4) chain of custody control.

(m) The discharger shall determine whether there is a statistically significant increase below the treatment zone using a statistical method that provides reasonable confidence that migration from the treatment zone will be identified. The discharger shall propose each statistical method in accordance with the provisions of this subsection and pursuant to the provisions of subsection 2550.7(e)(7) of this article. The regional board shall specify each statistical method pursuant to subsection 2550.7(e)(7) of this article that the regional board finds:

- (1) is appropriate for the distribution of the data used to establish background values; and
- (2) provides a reasonable balance between the probability of falsely identifying migration from the treatment zone and the probability of failing to identify real migration from the treatment zone.

(n) The discharger shall determine whether there is a statistically significant change over background values for each monitoring parameter and each constituent of concern to be monitored below the treatment zone each time the discharger conducts soil monitoring and soil-pore liquid monitoring under subsection (k) of this section.

(o) In determining whether a statistically significant increase has occurred, the discharger shall compare the value of each parameter or constituent, as determined pursuant to subsection (n) of this section, to the background value for that parameter or constituent according to the statistical procedure specified in the waste discharge requirements pursuant to this section.

(p) The discharger shall determine whether there has been a statistically significant increase below the treatment zone within a reasonable time period after completion of sampling. The regional board shall specify this time period in the waste discharge requirements after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of soil and soil-pore liquid samples.

(q) If the discharger determines pursuant to subsection (n) of this section, that there has been a statistically significant increase in the value of a hazardous constituent below the treatment zone the discharger shall:

(1) report to the regional board describing the full extent of the discharger's findings, including the identification of all constituents that have shown a statistically significant increase, within 72 hours of making such a determination; and

(2) submit written notification of this finding to the regional board within seven days of making such a determination.

(r) Upon receiving notice pursuant to subsection (q) of this section or upon the independent confirmation by the regional board, the regional board shall order the discharger to cease operating the land treatment unit. The discharger shall not resume operating the land treatment unit and shall close the land treatment unit unless one of the following actions is taken:

(1) the discharger completes appropriate removal or remedial actions to the satisfaction of the regional board and the discharger submits to the regional board and the board approves, an amended report of waste discharge to modify the operating practices at the unit to maximize the success of degradation, immobilization, or transformation processes in the treatment zone; or

(2) the discharger completes appropriate removal or remedial actions, submits to the regional board and the board approves, an amended report of waste discharge to modify the operating practices at the unit to maximize the success of degradation, immobilization, or transformation processes in the treatment zone, and equips the land treatment unit with liners, and a leachate collection and removal system that satisfy the provisions of sections 2542 and 2543 of Article 4 of this chapter.

(s) All actions taken by a discharger pursuant to subsections (r)(1) or (r)(2) of this section shall be completed within a time period specified by the regional board, which shall not exceed 18 months after the regional board receives notice pursuant to subsection (q)(1) of this section. If the actions are not completed within this time period, the land treatment unit shall be closed, unless granted an extension by the regional board due to exceptional circumstances beyond the control of the discharger.

(t) If the discharger determines pursuant to subsection (n) of this section that there is a statistically significant increase of hazardous constituents below the treatment zone, the discharger may demonstrate that the increase resulted from an error in sampling, analysis, or evaluation. While the discharger may make a demonstration pursuant to this subsection in addition to or in lieu of the requirements of subsection (r)(1) or (r)(2) of this section, the discharger is not relieved of the requirements of subsections (r) and (s) of this section unless the demonstration made pursuant to this subsection successfully shows that the increase resulted from an error in sampling, analysis, or evaluation. In making a demonstration pursuant to this subsection, the discharger shall:

(1) notify the regional board of this finding in writing within seven days of determining a statistically significant increase beneath the treatment zone that the discharger intends to make a demonstration pursuant to this subsection;

(2) within 90 days of such determination, submit a report to the regional board demonstrating that the increase resulted from error in sampling, analysis, or evaluation;

(3) within 90 days of such determination, submit to the regional board an amended report of waste discharge to make any appropriate changes to the unsaturated zone monitoring program for the land treatment unit; and

(4) continue to monitor in accordance with the unsaturated zone monitoring program established pursuant to this section.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, 13267, and 13304 Water Code.

§2550.12. Corrective Action Where Hazardous Waste Has Been Discharged at Areas Other Than Waste Management Units.

(a) A discharger seeking waste discharge requirements for the treatment, storage or disposal of hazardous waste shall institute corrective action as necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any area at the facility other than a waste management unit regardless of the time waste was discharged at such an area.

(b) A program of corrective action required under subsection (a) of this section shall be incorporated into an enforcement order under Chapter 5, commencing with section 13300, of Division 7 of the Water Code, or into the waste discharge requirements and the program shall contain time schedules for implementation and completion of such corrective action. A discharger required to undertake corrective action under this section shall provide assurances of financial responsibility for completing such corrective action.

(c) The discharger shall implement corrective actions beyond the facility property boundary where necessary to protect human health or the environment.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13263, 13267, and 13304 Water Code.

§2551. Required Programs. [Repealed]

§2552. Water Quality Protection Standards. [Repealed]

§2553. Points of Compliance. [Repealed]

§2554. Compliance Period. [Repealed]

§2555. General Ground Water Monitoring Requirements. [Repealed]

§2556. Detection Monitoring Program. [Repealed]

§2557. Verification Monitoring Program. [Repealed]

§2558. Corrective Action Program. [Repealed]

§2559. Unsaturated Zone Monitoring Program. [Repealed]

Article 6. Confined Animal Facilities [Repealed]

§2560. Applicability. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13140-13147, 13260, and 13263 Water Code.

§2561. General Standards. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13140-13147, 13260, and 13263 Water Code.

§2562. Wastewater Management. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172 Water Code.

§2563. Use or Disposal Field Management. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172 Water Code.

§2564. Management of Manured Areas. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172 Water Code.

§2565. Monitoring. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 and 13267 Water Code.

Article 7. Mining Waste Management [Repealed]

§2570. Applicability. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13226, 13260, 13263 Water Code.

§2571. Groups of Mining Waste. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172 Water Code.

§2572. Mining Waste Management Unit Siting and Construction Standards. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13226, and 13263 Water Code.

§2573. Water Quality Monitoring for Mining Waste Management Units. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13226, 13263, and 13267 Water Code.

§2574. Closure and Post-Closure Maintenance of Mining Waste Management Units. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13226, and 13263 Water Code.

Article 8. Closure and Post-Closure Maintenance

§2580. General Closure Requirements.

(a) Partial or final closure of new and existing classified waste management units shall be in compliance with the provisions of this article. If a unit has been partially closed in accordance with an approved closure plan by

the effective date of these regulations, the cover over the closed portion does not need to be modified to conform to these regulations, unless monitoring data indicate impairment of beneficial uses of ground water. Classified waste management units shall be closed according to an approved closure and post-closure maintenance plan which provides for continued compliance with the applicable standards for waste containment and precipitation and drainage controls in Article 4 of this chapter, and the monitoring program requirements in Article 5 of this chapter, throughout the closure and post-closure maintenance period. The post-closure maintenance period shall extend as long as the wastes pose a threat to water quality. For land treatment facilities, the postclosure maintenance period shall extend until treatment is complete.

(b) Closure shall be under the direct supervision of a registered civil engineer or a certified engineering geologist.

(c) [Reserved]

(d) Closed waste management units shall be provided with at least two permanent monuments installed by a licensed land surveyor or a registered civil engineer, from which the location and elevation of wastes, containment structures, and monitoring facilities can be determined throughout the post-closure maintenance period.

(e) Vegetation for closed waste management units shall be selected to require minimum irrigation and maintenance, and shall not impair the integrity of containment structures including the final cover.

(f) The regional board shall require the discharger to establish an irrevocable closure fund or provide other means to ensure closure and post-closure maintenance of each classified waste management unit in accordance with an approved plan.

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172 Water Code.

§2581. Landfill Closure Requirements. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172 Water Code.

§2582. Surface Impoundment Closure Requirements. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13260, and 13263 Water Code.

§2583. Waste Pile Closure Requirements. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172 Water Code.

§2584. Land Treatment Facility Closure Requirements. [Repealed]

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172 Water Code.

Article 9. Compliance Procedures

§2590. Reporting Requirements for Waste Discharge to Land.

(a) Any person discharging or proposing to discharge waste to land where water quality can be affected shall submit to the regional board a report of waste discharge, unless the report is waived by the regional board. This reporting requirement also applies to expansion of an existing waste management unit or development of new units at an existing site. Dischargers shall submit any applicable information required by this article to the

regional board upon request. Dischargers shall be required to provide information on waste characteristics, geologic and climatologic characteristics of the unit and the surrounding region, installed features, operation plans for waste containment, precipitation and drainage controls, and closure and post-closure maintenance plans as set forth in Sections 2594 through 2597 of this article.

(1) The discharger may submit a copy of the application for a hazardous waste facility permit, including the closure and post-closure maintenance plan, under Sections 66264.112 (for fully-permitted Units) or 66265.112 (for interim status Units) of Title 22 of this code as a report of waste discharge, together with the applicable filing fee, provided that such application includes the information required in this article.

(2) [Reserved]

(3) [Reserved]

(4) The discharger shall notify the regional board of changes in information submitted under this chapter, including any material change in the types, quantities, or concentrations of wastes discharged; site operations and features; or proposed closure procedures, including changes in cost estimates. The discharger shall notify the regional board a reasonable time before the changes are made or become effective. No changes shall be made without regional board approval following authorization for closure pursuant to the site closure notice required by subsection (c)(5) of this section.

(b) Deadlines for Reporting.

(1) Dischargers who own or operate existing waste management units subject to this chapter for which waste discharge requirements were issued before the effective date of this chapter shall, within six months of the effective date of this section, submit a technical report to the regional board describing the measures necessary to bring their monitoring programs into compliance with Article 5 of this chapter, including a schedule for achieving compliance. The regional board shall modify waste discharge requirements accordingly.

(2) Dischargers who own or operate existing waste management units subject to this chapter for which waste discharge requirements were issued before the effective date of this chapter shall submit a report of waste discharge which complies with subsection (a) of this section to the regional board, together with the appropriate filing fee, on request. Any applicable information required by Sections 2594 through 2597 of this article which has been submitted to the regional board, or another state agency, may be incorporated by reference, provided that the report shall not be considered complete until referenced information is received or obtained by the regional board.

(3) Dischargers who own or operate existing waste management units subject to this chapter which have not been classified under previous regulations and for which the discharger has not submitted a report of waste discharge before the effective date of this chapter, shall submit a report of waste discharge to the appropriate regional board within 60 days of the effective date of this chapter as required by Subsection 2510(d) of this chapter. The report shall be in accordance with subsection (a) of this section.

(c) Notification:

(1) The discharger shall notify the regional board in writing of any proposed change of ownership or responsibility for construction, operation, closure, or post-closure maintenance of a waste management unit subject to this chapter. This notification shall be given prior to the effective date of the change and shall include a statement by the new discharger that construction, operation, closure, and post-closure maintenance will be in compliance with any existing waste discharge requirements and any revisions thereof. The regional board shall amend the existing waste discharge requirements to name the new discharger.

(2) The regional board shall be notified immediately of any slope failure occurring in a waste management unit subject to this chapter. Any failure which threatens the integrity of containment features or the waste management unit(s) subject to this chapter shall be promptly corrected after approval of the method and schedule by the regional board.

(3) The regional board shall be notified within seven days if fluid is detected in a previously dry leachate collection and removal system or unsaturated zone monitoring system, or if a progressive increase is detected in the volume of fluid in a leachate collection and removal system.

(4) The discharger shall comply with the notification requirements in Article 5 of this chapter.

(5) The owner or operator of a waste management unit shall notify the regional board of units to be closed at least 180 days prior to beginning any partial or final closure activities, provided that the regional board may specify a shorter interval for particular units in the waste discharge requirements for such units. The notice shall include a statement that all closure activities will conform to the most recently approved closure plan and that the plan provides for site closure in compliance with all applicable federal and state regulations.

(6) The owner or operator of a waste management unit shall notify the regional board within 30 days after the completion of any partial or final closure activities. The discharger shall certify under penalty of perjury that all closure activities were performed in accordance with the most recently approved closure plan and in accordance with all applicable regulations. The discharger shall certify that closed waste management units shall be maintained in accordance with an approved post-closure maintenance plan unless post-closure maintenance has been waived pursuant to subsection (a)(3) of this section.

(d) Any report submitted under this section or any amendment or revision thereto which might affect containment features or monitoring systems shall be approved by a registered civil engineer or a certified engineering geologist.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13260, and 13267 Water Code.

§2591. Waste Discharge Requirements.

(a) The regional board shall adopt waste discharge requirements that implement the applicable provisions of this chapter.

(b) The regional board shall revise waste discharge requirements as necessary to implement the provisions of this chapter.

(c) For waste management units subject to this chapter, classifications and waste discharge requirements for existing units shall be fully reviewed in accordance with schedules established by regional boards. In no instance shall such review be beyond five years of the effective date of this section. The waste discharge requirements shall be revised to incorporate reclassification and retrofitting requirements as provided in Subsections 2510(e) and 2540(b) of this chapter, as well as the revised monitoring program developed under Subsection 2590(b)(1) of this article. The regional board shall specify in waste discharge requirements the schedule for retrofitting of existing facilities. All retrofitting shall be complete within five years from the issuance of the revised waste discharge requirements.

(d) Waste discharge requirements for new waste management units or for expansion of existing units shall not be effective until the regional board is notified that all local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved use of the site for discharges of waste to land.

(e) Appropriate classifications and waste discharge requirements for all waste management units in a single facility may be included in a single set of waste discharge requirements applicable to the facility as a whole and

to each within the facility. Requirements relating to precipitation and drainage control systems for two or more adjacent waste management units may be consolidated provided that consolidated requirements reflect standards for the highest level of containment applicable to any waste management unit involved.

(f) The discharger shall be required to maintain legible records of the volume and type of each waste discharged at each waste management unit and the manner and location of discharge. Such records shall be on forms approved by the State Board and shall be maintained at the waste management facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the State Board and regional boards at any time during normal business hours. At the beginning of the post-closure maintenance period, copies of these records shall be sent to the regional board.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, and 13263 Water Code.

§2592. Public Participation.

(a) To ensure adequate public participation in regional board proceedings relating to land disposal of wastes, the following persons and entities shall receive individual notice of any public hearing or board meeting involving classification of waste management units or the issuance of waste discharge requirements for classified units:

- (1) the discharger and responsible public agencies;
- (2) news media serving the county as well as communities within five miles of the waste management unit;
- (3) citizens groups representing local residents;
- (4) environmental organizations in affected counties; and
- (5) interested industrial organizations.

(b) Notice of hearings or meetings related to Class I waste management units or discharges of hazardous waste shall be given not less than 45 days before the meeting at which such actions will be taken, and copies of the agenda package shall be available not less than 30 days before the meeting, provided that enforcement actions involving releases of hazardous wastes may be taken at meetings which comply with the 10-day notice requirements of the California State Body Open Meetings Act and that emergency actions (as described in Subsection 647.2(d) of this Chapter) shall be exempt from public participation and notice requirements.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13260, and 13302 Water Code.

§2593. Mandatory Closure (Cease and Desist Orders).

(a) If the regional board finds that early closure of a waste management unit is necessary to prevent violation of waste discharge requirements, it shall adopt a Cease and Desist Order pursuant to Section 13302 of the Water Code which requires closure according to an approved closure and post-closure maintenance plan.

(b) The discharger shall submit to the regional board a report including the closure and post-closure maintenance plan described in Section 2597 of this article, if such a plan was not submitted with the report of waste discharge; and a revised schedule for immediate termination of operations and closure.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13301 and 13304 Water Code.

§2594. Waste Characteristics.

(a) Dischargers shall provide the following information in the report of waste discharge about the characteristics of wastes to be discharged at the waste management units subject to this chapter.

(1) A list of the types, quantities, and concentrations of wastes proposed to be discharged at each unit. Wastes and known waste constituents shall be specifically identified according to the most descriptive nomenclature. A listing for hazardous waste constituents shall include reference numbers for listings established by DHS or USEPA (e.g., Appendix IX to §66264 of Title 22 of this code).

- (2) A description of proposed treatment, storage, and disposal methods.
- (3) An analysis of projected waste decomposition processes for each waste management unit indicating intermediate and final decomposition products and the period during which decomposition will continue following discharge.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13260, and 13267 Water Code.

§2595. Waste Management Unit Characteristics.

(a) Dischargers shall provide in the report of waste discharge an analysis describing how the ground and surface water may affect the waste management unit and how the unit may affect ground and surface water. This information is used to determine the suitability of the unit with respect to ground water protection and avoidance of geologic hazards. It will also be used to demonstrate that the unit meets the classification criteria set forth in Article 3 of this chapter.

(b) Dischargers shall provide the following data on the physical characteristics of the waste management unit and the surrounding region in order to demonstrate suitability for the Class I classification. Information shall be presented in understandable written, tabular, and graphic format as appropriate, and shall be at a level of detail appropriate for the Class I Unit classification. Plans, diagrams, and other graphics shall be prepared to appropriate scale and each shall include a legend identifying the information presented. All sources of data shall be identified.

(c) If a report submitted by a discharger refers to another source, the relevant information from that source shall be restated in the report. If the source is not generally available, the relevant portion(s) of the source shall be included verbatim in the report as an appendix.

(d) Topography.

(1) A map of the waste management unit and its surrounding region within one mile of the unit, showing elevation contours, natural ground slopes, drainage patterns, and other topographic features.

(2) Identification of whether the facility is located within a 100-year floodplain. This identification must indicate the source of data for such determination and include a copy of the relevant Federal Emergency Management Administration (**FEMA**) flood map, if used, or the calculations and maps used where a FEMA map is not available. Information shall also be provided identifying the 100-year flood plain and any other special flooding factors (e.g., wave action) which must be considered in designing, constructing, operating, or maintaining the facility to withstand washout from a 100-year flood. Owners and operators of facilities located in the 100-year floodplain shall provide the following information:

(A) Engineering analysis to indicate the various hydrodynamic and hydrostatic forces expected to result at the site as consequence of a 100-year flood.

(B) Structural or other engineering studies showing the design of waste management units and flood protection devices (e.g., floodwalls, dikes) at the facility and how these will prevent washout.

(e) **Climatology**--Dischargers shall calculate required climatologic values for Class I waste management units from measurements made at a nearby climatologically similar station. In addition to the required calculations for each unit, dischargers shall provide the source data from which such values were calculated, together with the name, location, and period of record of the measuring station.

(1) A map showing isohyetal contours for the proposed waste management unit and its surrounding region within ten miles, based on data provided by the National Weather Service or other recognized federal, state, local, or private agencies.

- (2) Estimated maximum and minimum annual precipitation at the proposed waste management unit.
- (3) Maximum expected 24-hour precipitation for storm conditions specified as design criteria for Class I waste management units, as prescribed in Table 4.1 of Article 4 of this chapter.
- (4) Estimated mean, minimum, and maximum evaporation, with the months of occurrence of maximum and minimum evaporation, for the proposed waste management unit.
- (5) Projected volume and pattern of runoff for the proposed waste management unit including peak stream discharges associated with the storm conditions specified as design criteria for a Class I Unit, as prescribed in Table 4.1 of Article 4 of this chapter.
- (6) An estimated wind rose for the proposed waste management unit showing wind direction, velocity, and percentage of time for the indicated direction.

(f) Geology.

- (1) A geologic map and geologic cross-sections of the waste management unit showing lithology and structural features. Cross-sections shall be indexed to the geologic map and shall be located to best portray geologic features relevant to discharge operations.
- (2) A description of natural geologic materials in the waste management unit and its surroundings, including identification of rock types, nature of alteration depth and nature of weathering, and all other pertinent lithologic data.
- (3) A description of the geologic structure of the waste management unit, including the attitude of bedding (if any); thickness of beds (if any); the location, attitude, and condition (tight, open, clay-or gypsum-filled, etc.) of any fractures; the nature, type (anticlinal, synclinal, etc.), and orientation of any folds; the location, attitude, and nature (tight, gouge-filled, etc.) of any faults; and all other pertinent structural data.
- (4) The results of a testing program for determination of physical and chemical properties of soils needed to formulate detailed site design criteria.
- (5) A determination of the expected peak ground acceleration at the waste management unit associated with the maximum credible earthquake. The methodology used shall consider regional and local seismic conditions and faulting. Data and procedures shall be consistent with current practice and shall be based on an identified procedure or publication. The analyses shall include modifications to allow for site-specific surface and subsurface conditions. The peak ground acceleration so determined shall be the stability and factors of safety for all embankments, cut slopes, and associated landfills during the design life of the unit. The analysis shall include:
 - (A) the method use to calculate the factors of safety (e.g., Bishop's modified method of slices, Fellinius circle method, etc.);
 - (B) the name of any computer program used to determine the factors of safety; and
 - (C) a description of the various assumptions used in the stability analyses (height of fill, slope-and-bench configuration, etc.).
- (6) Dischargers who own or operate new Class I waste management units and expansions of existing units shall demonstrate that no faults which have had displacement in Holocene time pass within 200 feet of units. This demonstration may be made using either published geologic data or data obtained from field investigations carried out by the applicant. The information provided shall be acceptable to geologists experienced in identifying and evaluating seismic activity. The information submitted shall show that either:
 - (A) no faults which have had displacement in Holocene time are present, or no lineations which suggest the presence of a fault (which have displacement in Holocene time) within 3,000 feet of a facility are present, based on data from:

1. published geologic studies,
2. aerial reconnaissance of the area within a 5-mile radius from the facility,
3. an analysis of aerial photographs covering a 3,000-foot radius of the facility, and
4. if needed to clarify the above data, a reconnaissance based on walking portions of the area within 3,000 feet of the facility, or

(B) if faults (to include lineations) which have had displacement in Holocene time are present within 3,000 feet of a facility, no faults pass within 200 feet of the portions of the facility where treatment, storage, or disposal of hazardous waste will be conducted, based on data from a comprehensive geologic analysis of the site. Unless a site analysis is otherwise conclusive concerning the absence of faults within 200 feet of such portions of the facility data shall be obtained from a subsurface exploration (trenching) of the area within a distance no less than 200 feet from portions of the facility where treatment, storage, or disposal of hazardous waste will be conducted. Such trenching shall be performed in a direction that is perpendicular to known faults (which have had displacement in Holocene time) passing within 3,000 feet of the portions of the facility where treatment, storage, or disposal of hazardous waste will be conducted. Such investigation shall document with supporting maps and other analyses, the location of faults found.

(g) Hydrology.

(1) An evaluation of the water-bearing characteristics of the natural geologic materials identified under subsection (f)(2) of this section including determination of permeability, delineation of all ground water zones and basic data used to determine the above.

(2) An evaluation of the in place permeability of soils immediately underlying waste management unit. This evaluation shall include:

(A) permeability data, in tabular form, for selected locations within the unit;

(B) a map of the unit showing test locations where these permeability data were obtained; and

(C) an evaluation of the test procedures and rationale used to obtain these permeability data.

(3) An evaluation of the perennial direction(s) of ground water movement within the uppermost ground water zone(s) within one mile of the waste management facility perimeter.

(4) Estimates of the height to which water rises due to capillary forces above the uppermost ground water zone(s) beneath and within one mile of the waste management facility perimeter. These estimates shall include an evaluation of the methods and rationale used in their development.

(5) A map showing the location of all springs in the waste management facility and within one mile of its perimeter. The map shall be accompanied by tabular data indicating the flow and the mineral quality of the water from each spring.

(6) An evaluation, supported by water quality analyses, of the quality of water known to exist under or within one mile of the waste management facility perimeter including all data necessary to establish water quality protection standards.

(7) A tabulation of background water quality for all applicable indicator parameters and waste constituents.

(A) Background water quality for an indicator parameter or a waste constituent in ground water shall be based on data from quarterly sampling of wells upgradient from the waste management unit for one year. These analyses shall:

1. account for measurement errors in sampling and analysis; and
2. account for seasonal fluctuations in background water quality, if such fluctuations are expected to affect the concentration of the hazardous constituent.

(B) In an evaluation monitoring program, background water quality may be based on appropriate water quality data that are available before waste discharge requirements are issued in lieu of a one-year monitoring program.

(C) Background water quality of ground water may be based on sampling of wells that are not upgradient from the waste management unit where:

1. hydrogeologic conditions do not allow the determination of the upgradient direction; or
2. sampling at other wells will provide a representative indication of background water quality.

(D) In developing the data base used to determine a background value for each indicator parameter or waste constituent in ground water, the discharger shall take a minimum of one sample from each well used to determine background. A minimum of four samples shall be taken from the entire system used to determine background water quality, each time the system is sampled. Should there be only one background well, the four measurements per quarter shall be obtained by splitting the sample from the one well into four aliquots and conducting separate analyses for each aliquot.

(h) **Land and water use.**

(1) A map showing the locations of all water wells, oil wells, and geothermal wells in the waste management unit or within one mile of its perimeter.

(2) Name and address of the owner of each well indicated in subsection (h) of this section.

(3) Well information, where available, for each water well indicated in subsection (h)(1) of this section including, but not limited to:

- (A) total depth of well;
- (B) diameter of casing at ground surface and at total depth;
- (C) type of well construction (cable-tool, rotary, etc.);
- (D) depth and type of perforations;
- (E) name and address of well driller;
- (F) year of well construction;
- (G) use of well (agricultural, domestic, stock watering, etc.);
- (H) depth and type of seals;
- (I) lithologic, geophysical, and other types of well logs, if available; and
- (J) water levels, pump tests, water quality, and other well data, if available.

(4) Current land use within one mile of the perimeter of the waste management unit, including:

- (A) types of land use (e.g., residential, commercial, industrial, agricultural, recreational, etc.);
- (B) types of crops;
- (C) types of livestock; and
- (D) number and location of dwelling units.

(5) Current and estimated future use of ground water within one mile of the perimeter of the waste management unit.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172, 13260, and 13267 Water Code.

§2596. Design Report and Operations Plan.

(a) **Design Report.**

(1) Dischargers who own or operate classified waste management units shall submit detailed preliminary and as-built plans, specifications, and descriptions for all liners, containment structures, leachate collection and removal system components, leak detection system components, precipitation and drainage control facilities, and interim covers which will be installed or used at each unit. Dischargers shall submit a description of and location data for ancillary facilities including roads, waste handling areas, buildings, and equipment cleaning facilities.

(2) Dischargers who submit information described in subsection (a)(1) of this section to DTSC pursuant to Sections 66264.112 (for fully-permitted Units) or 66265.112 (for interim status Units) of Title 22 of this code need not submit this information to the regional board as a separate submittal. A copy of all information described in subsection (a)(1) of this section submitted to DTSC shall also be submitted to the regional board.

(3) Dischargers shall submit detailed plans and equipment specifications for compliance with the ground water and unsaturated zone monitoring requirements of Article 5 of this chapter. Dischargers shall provide a technical report which includes rationale for the spatial distribution of ground water and unsaturated zone monitoring facilities, for the design of monitoring points, and for the selection of other monitoring equipment. This report shall be accompanied by:

(A) a map showing the locations of proposed monitoring facilities; and

(B) drawings and data showing construction details of proposed monitoring facilities. These data shall include:

1. casing and test hole diameter;
2. casing materials (PVC, stainless steel, etc.);
3. depth of each test hole;
4. size and position of perforations;
5. method of joining sections of casing;
6. nature of filter material;
7. depth and composition of seals; and
8. method and length of time of development; and

(C) specifications, drawings, and data for location and installation of unsaturated zone monitoring equipment.

(4) Dischargers shall submit proposed construction and inspection procedures to the regional board for approval.

(b) Operation Plans.

(1) Dischargers shall submit operation plans describing the waste management unit operation which shall include:

(A) a description of proposed treatment, storage, and disposal methods;

(B) contingency plans for the failure or breakdown of waste handling facilities or containment systems, including notice of any such failure, or any detection of waste or leachate in monitoring facilities, to the regional board, local governments, and water users downgradient of waste management units; and

(C) description of inspection and maintenance programs which will be undertaken regularly during disposal operations and the post-closure maintenance period.

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13360 Water Code.

§2597. Closure and Post-Closure Maintenance Plan.

(a) The following information shall be included in the closure and post-closure maintenance plans:

- (1) Projected schedule for partial and final closure.

(2) Description of proposed final treatment procedures which may be used for the wastes in each waste management unit, including methods for total removal and decontamination, if applicable. If alternative treatment or disposal procedures are under consideration for particular units or for the entire facility, a description of the alternatives is required.

(3) A topographic map, at appropriate scale, contour interval, and detail showing the boundaries of the unit or facility to be closed and projected final contours and any changes in natural surface drainage patterns.

(4) A description of the design and the location of all features and systems which will provide waste containment during the post-closure maintenance period to the extent that such features and systems differ from those described under Section 2596 of this article.

(5) A description of the precipitation and drainage control features at closed units, to the extent that such features differ from those described under Section 2596 of this article.

(6) A description of the leachate control features and procedures at closed units, to the extent that such features and procedures described under Section 2596 of this article.

(7) A map and discussion of ground water and unsaturated zone monitoring programs for the post-closure maintenance period, including location, construction details, and rationale of all monitoring facilities; to the extent that such systems differ from those described under Section 2596 of this article.

(8) An evaluation of anticipated settlement due to decomposition and compaction of wastes and subsidence of underlying natural geologic materials.

(9) A description of the nature of the final cover, including its physical characteristics, permeability, thickness, slopes, elasticity (shrink and swell), and erodability, including design details of all proposed landscaping, drainage and irrigation facilities, and other features to be placed over the final cover.

(10) The post-closure land use of the disposal site and the surrounding area.

(11) Estimates of costs for closure and post-closure maintenance for the anticipated post-closure maintenance period.

(b) If the waste management unit is to be used for purposes other than nonirrigated open space during the post-closure maintenance period, the discharger shall submit a map showing all proposed structures, landscaping, and related features to be installed and maintained over the final landfill cover. This map shall be at a scale of 1" = 100' and shall be accompanied by:

(1) a description and quantification of water entering, leaving, and remaining on-site from all sources to determine potential adverse impacts due to the proposed use, and corresponding mitigative design features that will ensure the physical and hydraulic integrity of the final cover; and

(2) detailed design plans and description(s) of the monitoring system(s) that will effectively detect penetration of the final cover by precipitation or applied irrigation waters.

(c) Dischargers who submit information described in subsection (a) of this section to DTSC pursuant to Sections 66264.112 (for fully-permitted Units) or 66265.112 (for interim status Units) of Title 22 of this code need not submit this information to the regional board as a separate submittal. A copy of all information described in subsection (a) of this section submitted to DTSC shall also be submitted to the regional board.

(d) The regional board shall approve the water quality aspects of closure and post-closure maintenance plans for Class I waste management units.

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13360 Water Code.

Article 10. Definitions

§2600. Statutory Definitions.

Except as otherwise indicated in this article, definitions of terms used in this chapter shall be those set forth in Division 7 (commencing with Section 13000 of the Water Code, or Chapter 6.5 of Division 20 of the Health and Safety Code (commencing with Section 25100).

§2601. Technical Definitions.

- “**Active life**” means the period during which wastes are being discharged to a waste management unit. The active life continues until final closure of the waste management unit has been initiated pursuant to Article 8 of this chapter. For surface impoundments, the active life includes any time when the impoundment contains liquid fluid, including waste and leachate.
- “**Affected medium**” means any medium (e.g., ground water, surface water, or the unsaturated zone) that has been affected by a release from a waste management unit.
- “**Aquifer**” means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs.
- “**Attitude**”^{**} means either the orientation in space of a geologic structural feature or the structural element position of a geologic bed, stratum, fracture, or surface relative to the horizontal.
- “**Background**” means the concentrations or measures of constituents or indicator parameters in water or soil that has not been affected by waste constituents, or leachate from a the waste management unit being monitored.
- “**Background monitoring point**” means a well, device, or location specified in the waste discharge requirements at which monitoring for background water quality or background soil quality is conducted.
- “**Background plot**” means an area adjacent to a waste management unit used for land treatment that can reasonably be expected to have the same, or similar soil conditions as were present at the waste management unit prior to discharges of waste.
- “**Best management practices**” means a practice, or combination of practices, that is the most effective and feasible means of controlling pollution generated by nonpoint sources for the attainment of water quality objectives.
- “**Capillary force(s)**” means the adhesive force between liquids and solids which, in the case of ground water hydrology, causes soil-pore liquid to move in response to differences in matric potential. This effect causes ground water to rise from a saturated zone into the unsaturated zone, thereby creating a capillary fringe.
- “**Classified waste management unit**” means a waste management unit that has been classified by a regional board according to the provisions of Article 3 of this chapter.
- “**Closure**” means termination of waste discharges at a waste management unit and operations necessary to prepare the closed unit for post-closure maintenance. Closure may be undertaken incrementally.
- “**Coefficient of variation**” means the standard deviation divided by the mean. It is a statistical measure of the dispersion of individual samples relative to the mean value of the samples.
- “**Concentration limit**” means the value for a constituent specified in the water quality protection standard including, but not limited to, values for concentration, temperature, pH, conductivity, and resistivity.

- “**Confined animal facility**” means any place where cattle, calves, sheep, swine, horses, mules, goats, fowl, or other domestic animals are corralled, penned, tethered, or otherwise enclosed or held and where feeding is by means other than grazing.
- “**Constituent**” means an element or compound which occurs in or is likely to be derived from waste discharged to the waste management unit or a component of waste which is detectable.
- “**Constituents of concern**” means any waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in a waste management unit.
- “**Containment**” means the use of waste management unit characteristics or installed systems and structures to prevent or restrict the release of waste constituents or leachate.
- “**Containment feature**” means any feature, whether natural or artificial, used to contain waste constituents or leachate.
- “**Containment structure**” means an artificial feature installed to contain waste constituents or leachate.
- “**Contaminated materials**” means materials that contain waste constituents, or leachate.
- “**Control chart**” means a graphical method for evaluating whether a process is or is not in a state of statistical control.
- “**Cover**” means a membrane or earthen layer placed over the closed portion of a waste management unit.
- “**Cross-contamination**” means a condition created when a drill hole, boring, or improperly-constructed well forms a pathway for fluid movement between a saturated zone which contains pollutants and a formerly separated saturated zone containing uncontaminated ground water.
- “**Cutoff wall**” means a subsurface barrier to lateral fluid movement which extends from in-place natural geologic materials with the required permeability to ground surface.
- “**Decomposable waste**” means waste which, under suitable natural conditions, can be transformed through biological and chemical processes into compounds which do not impair the quality of waters of the state. Incomplete decomposition, may result in some water quality degradation (e.g., hardness, taste, odor, etc.).
- “**Dedicated**” means a waste management unit which is used exclusively for discharges of particular wastes.
- “**Dendritic**” means a subdrain system that is arranged in a branching pattern.
- “**Dewatered sludge**” means residual semi-solid waste from which free liquid has been evaporated, or otherwise removed.
- “**Discharger**” means any person who discharges waste which could affect the quality of waters of the state, and includes any person who owns a waste management unit or who is responsible for the operation of a waste management unit. When referring to dischargers of hazardous waste, the terms "discharge" and "waste" in this definition have the same meaning as they would have under the definitions for these terms provided in section 66260.10 of Chapter 11 of Division 4.5 of Title 22, CCR, effective July 1, 1991.
- “**DTSC**” means Department of Toxic Substances Control.
- “**Electrical conductivity**” means the relative ability of water to conduct electrical current. It depends on the ion concentration of and can be used to approximate the total filterable residue (total dissolved solids) in the water.

- “**Excess exposure**” means that, for an organism exposed to a release from a waste management unit, the combined effect of all hazardous constituents in the organism's environment is such that the organism will suffer some measureable adverse effect on health or reproductive success, which is partly or wholly attributable to the release.
- “**External hydrogeologic forces**” means seasonal and other fluctuations in ground water levels, and any other hydraulic condition which could cause a change in the hydraulic stress on a containment structure.
- “**Facility**” - See "Waste Management Facility."
- “**Facility wastewater**” means all wastewater, from whatever source, produced at a confined animal facility.
- “**Floodplain**” means the land area which is subject to flooding in any year from any source.
- “**Freeboard**” means the vertical distance between the lowest point along the top of a surface impoundment dike, berm, levee, or other similar feature and the surface of the liquid contained therein.
- “**Free liquid**” means liquid which readily separates from the solid portions of waste under ambient temperature and pressure. Free liquids are not present when a 100 milliliter representative sample of the waste can be completely retained in a standard 400 micron conical paint filter for 5 minutes without loss of any portion of the waste from the bottom of the filter (or an equivalent test approved by DTSC).
- “**Geologic materials**” means in-place naturally occurring surface and subsurface rock and soil.
- “**Ground acceleration**” means acceleration of earth particles caused by an earthquake.
- “**Ground rupture**” means disruption of the ground surface due to natural or man-made forces; e.g., faulting, landslides, subsidence.
- “**Ground water**” means (for the purpose of this chapter) water below the land surface that is at or above atmospheric pressure.
- “**Grout curtain**” means a subsurface barrier to fluid movement, installed by injecting grout mixtures (such as cement, silicates, synthetic resins, etc.) to fill and seal fractures in rock.
- “**Hazardous constituent**” means a constituent identified in Appendix VIII to Chapter 11 of Division 4.5 of Title 22, CCR, or an element, chemical compound, or mixture of compounds which is a component of a waste or leachate and which has a physical or chemical property that causes the waste or leachate to be identified as a hazardous waste by the California Department of Toxic Substances Control.
- “**Hazardous waste**” means any waste which, under Article 1, Chapter 11, Division 4.5 (§66261.3 et seq.) of Title 22 of this code, is required to be managed according to Division 4.5 of Title 22 of this code.
- “**Head**” or “**hydraulic head**” means the pressure exerted by fluid on a given area. It is caused by the height of the fluid surface above the area.
- “**Holocene fault**” means a fault which is or has been active during the last 11,000 years.
- “**Inactive mining waste management unit**” means any area containing mining wastes which is located at a present or former mining or milling site, and where all mining operations and discharges of mining waste ended and have not been resumed for 5 years, or more.
- “**Independent sample**” means an individual sample of a monitored medium, obtained from a given monitoring point, that:

(1) does not contain a parcel of the medium that has been previously sampled at that monitoring point sufficient to cause a measurable effect in the analytical results; and

(2) has not been otherwise affected differently than any other individual sample or group of samples with which it will be compared.

In applying No. 1 above to ground water monitoring, the parcel of water of interest is the parcel of water that was in the well bore at the time of any previous sampling event.

“**Indicator parameters**” means measurable physical or chemical characteristics of water or soil-pore moisture which are used to detect the presence of waste constituents in water or soil-pore moisture, or the effects of waste constituents on waters of the state.

“**Interim cover**” means any cover other than the final cover. It includes daily cover and intermediate cover as defined in Title 14 of this code.

“**Landfill**” means a waste management unit at which waste is discharged in or on land for disposal. It does not include surface impoundment, or waste pile, land treatment, or soil amendments.

“**Land treatment unit**” or “**land treatment facility**” means a waste management unit at which liquid and solid waste is discharged to, or incorporated into, soil for degradation, transformation, or immobilization within the treatment zone. Such units are disposal units if the waste will remain after closure.

“**Leachate**” means any liquid fluid, formed by the drainage of liquids from waste or by the percolation or flow of liquid through waste. It includes any constituents extracted from the waste and dissolved or suspended in the fluid.

“**Liner**” means a continuous layer of natural or artificial material or a continuous membrane of artificial material installed beneath or on the sides of a waste management unit, which acts as a barrier to vertical or lateral fluid movement.

“**Liquid waste**” means any waste materials which are not spadable.

“**Manure**” means the accumulated moist animal excrement that does not undergo decomposition or drying as would occur on open grazing land or natural habitat. This definition shall include feces and urine which may be mixed with bedding materials, spilled feed, or soil.

“**Maximum credible earthquake**” means the maximum earthquake that appears capable of occurring under the presently known geologic framework. In determining the maximum credible earthquake, little regard is given to its probability of occurrence except that its likelihood of occurring is great enough to be of concern.

“**Maximum probable earthquake**” means the maximum earthquake that is likely to occur during a 100-year interval.

“**Mining waste**” means all waste materials (solid, semi-solid, and liquid) from the mining and processing of ores and minerals including soil, waste rock, and other forms of overburden as well as tailings, slag, and other processed mining wastes.

“**Moisture-holding capacity**” means the amount of liquid which can be held against gravity by waste materials without generating free liquid.

“**Monitoring parameter**” means one of the set of parameters specified in the waste discharge requirements for which monitoring is conducted. Monitoring parameters shall include physical parameters, waste constituents,

reaction products, and hazardous constituents, that provide a reliable indication of a release from a waste management unit.

- “**Monitoring point**” means a well, device, or location specified in the waste discharge requirements at which monitoring is conducted and at which the water quality protection standard applies.
- “**Operating**” means waste management units which are currently receiving wastes. It includes temporarily idle units containing wastes and at which discharges of waste may resume.
- “**Peak stream flow**” means the maximum expected flow of surface water at a waste management facility from a tributary watershed for a given recurrence interval.
- “**Perched ground water**” means a body of unconfined ground water separated from the zone of saturation by a portion of the unsaturated zone. Such perched water may be either permanent or ephemeral.
- “**Permeability**” means the ability of natural and artificial materials to transmit fluid.
- “**Physical parameter**” means any measurable physical characteristic of a substance including, but not limited to, temperature, electrical conductivity, pH, and specific gravity.
- “**Point of compliance**” means a vertical surface located at the hydraulically downgradient limit of a waste management unit that extends through the uppermost aquifer underlying the unit.
- “**Post-closure maintenance**” means all activities undertaken at a closed waste management unit to maintain the integrity of containment features and to monitor compliance with applicable performance standards.
- “**Post-closure maintenance period**” means the period after closure during which the waste could have an adverse effect on the quality of the waters of the state.
- “**Probable maximum precipitation**” means the estimated amount of precipitation for a given duration, drainage area, and time of year, which approaches and approximates the maximum that is physically possible within the limits of contemporary hydrometeorological knowledge and techniques. There is virtually no risk of its being exceeded.
- “**P-value**” means the smallest significance level for which the null hypothesis would be rejected, based on the data that was actually observed.
- “**Rapid geologic change**” means alteration of the ground surface through such actions as landslides, subsidence, liquefaction, and faulting.
- “**R Chart** (range chart)” means a control chart for evaluating the variability within a process in terms of the subgroup range R.
- “**Reconstruction**” means modification to an existing waste management unit which entails costs amounting to 50 percent or more of the initial cost of the unit.
- “**Relative compaction**” means the degree of compaction achieved, as a percentage of the laboratory compaction, in accordance with accepted civil engineering practices.
- “**Runoff**” means any precipitation, leachate, or other liquid that drains from any part of a waste management unit.
- “**Runon**” means any precipitation, leachate, or other liquid that drains onto any part of a waste management unit.

- “**Saturated zone**” means an underground zone in which all openings in and between natural geologic materials are filled with water.
- “**Semi-solid waste**” means waste containing less than 50 percent solids.
- “**Sensitive biological receptor of concern**” means a member of any species of organism whose members are likely to be exposed to a release from a waste management unit and experience some measurable adverse effect as a result of that exposure.
- “**Slope failure**” means downward and outward movement of ground slopes (e.g., natural rock, soil, artificial fills, or continuations of these materials).
- “**Sludge**” means residual solids and semi-solids from the treatment of water, wastewater, and other liquids. It does not include liquid effluent discharged from such treatment processes.
- “**Soil-pore liquid**” means the liquid contained in openings between particles of soil in the unsaturated zone.
- “**Sorbent**” means a substance which takes up and holds a liquid either by absorption or adsorption.
- “**Statistically significant**” means that the measured difference between a sample value (e.g., monitoring samples) and background values (or values set as water quality objectives, etc.) is greater than the difference that could be measured between various samples from substances known to have the same characteristics a statistical test has a p-value that is small enough for the null hypothesis to be rejected.
- “**Storage**” means the holding of waste for a temporary period, at the end of which, the waste is either treated or is discharged elsewhere.
- “**Storm**” means the maximum precipitation for a given duration that is expected during the given recurrence interval.
- “**Surface impoundment**” means a waste management unit which is a natural topographic depression, excavation, or diked area, and which is designed to contain liquid wastes or wastes containing free liquids, and which is not an injection well.
- “**Tailings pond**” means an excavated or diked area and which is intended to contain liquid and solid wastes from mining and milling operations.
- “**Transmissivity**” means the rate at which water of the prevailing kinematic viscosity is transmitted through a unit width of the aquifer under a unit hydraulic gradient.
- “**Treatment**” means any method, technique, or process designed to change the physical, chemical, or biological characteristics of waste so as to render it less harmful to the quality of the waters of the state, safer to handle, easier to contain or manage, including use as fuel, nutrient, or soil amendment.
- “**Treatment zone**” means a soil area of the unsaturated zone of a land treatment unit within which constituents of concern are degraded, transformed, or immobilized.
- “**Underlying ground water**”, for the purposes of waste management unit siting criteria, includes water which rises above the saturated zone of saturation due to capillary forces.
- “**Unified Soil Classification System**” means one of the several generally accepted methods for soil identification and classification for construction purposes presented in Geotechnical Branch Training Manuals No. 4, 5, and 6, published by the United States Bureau of Reclamation in January of 1986, which is

hereby incorporated by reference (available from Bureau of Reclamation, Engineering and Research Center, Attention: Code D-7923-A, P.O. Box 25007, Denver, Colorado 80225).

- “**Unsaturated zone**” means the zone between the ground surface and the regional water table or, in cases where the uppermost aquifer is confined, the zone between the ground surface and the top of the saturated portion of the aquifer=s confining layer.
- “**Uppermost aquifer**” means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer.
- “**Waste constituent**” means a constituent that is reasonably expected to be in or derived from waste contained in a waste management unit.
- “**Waste management facility**” or “**facility**” means the entire parcel of property at which waste discharge operations are conducted. Such a facility may include one or more waste management units.
- “**Waste management unit**” means an area of land, or a portion of a waste management facility, at which waste is discharged. The term includes containment features and ancillary features for precipitation and drainage control and monitoring.
- “**Waste pile**” means a waste management unit at which only noncontainerized, bulk, dry solid waste is discharged and piled on the land surface.
- “**X Bar chart**” means a control chart for evaluating the process level or subgroup differences in terms of the subgroup average.
- “**Zone of saturation**” means the subsurface zone extending downward from the base of the unsaturated zone in which the interstices are filled with water under pressure that is equal to or greater than atmospheric pressure. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13172 Water Code.

NOTE: Appendix I not included in this file.