

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2013-0031

WASTE DISCHARGE REQUIREMENTS
FOR

TUOLUMNE COUNTY COMMUNITY RESOURCES AGENCY
BIG OAK FLAT (GROVELAND) SANITARY LANDFILL
CLASS III MUNICIPAL SOLID WASTE LANDFILL
POST-CLOSURE MAINTENANCE,
AND CORRECTIVE ACTION
TUOLUMNE COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board) finds that:

1. The Tuolumne County Community Resources Agency (hereafter Discharger) owns and operates the closed Class III Big Oak Flat (Groveland) Sanitary Landfill (Facility) located approximately two miles south of the unincorporated town of Groveland at the end of Merrell Road, in Section 33, T1S, R16E, MDB&M, as shown in Attachment A, which is incorporated herein and made part of this Order by reference. The Facility is a municipal solid waste (MSW) landfill regulated under authority given in Water Code section 13000 et seq.; California Code of Regulations, title 27 ("Title 27"), section 20005 et seq.; and 40 Code of Federal Regulations section 258 (hereafter referred to as "Subtitle D") in accordance with State Water Resources Control Board (State Water Board) Resolution 93-62.
2. The closed Facility is on a 10-acre property that the County of Tuolumne (County) initially leased from the United States Department of the Interior Bureau of Land Management (BLM). The Facility consists of one unlined waste management unit (Unit) covering five acres. The Facility is comprised of Assessor Parcel Number (APN) 066-181-74. The closed landfill area is shown in Attachment B, which is incorporated herein and made part of this Order by reference.
3. The existing landfill Unit initiated operation in 1965. The Facility began operating as a burn dump in 1967. Burning ceased in 1975 and the Facility was operated as a "canyon fill" landfill. By the end of 2000, the total waste volume was estimated to be 124,863 cubic yards. The Facility ceased accepting waste in May 2001. The landfill was capped and closed in accordance with a Final Closure and Post-Closure Maintenance Plan (Revision 3) for the Facility dated May 2002. The County completed installation of the closure cap and cover in late 2002.
4. The landfill was under the administrative jurisdiction of the County Road Department prior to 1980, when this responsibility was transferred to the County Division of Environmental

Health. The site lease with the BLM expired in 1992 and was granted an extension pending acquisition of the property by the County under a federal program established in 1992. The administrative responsibility for the landfill was transferred to the County's Department of Public Works. The County acquired the property from BLM on 14 October 2004.

5. On 1 July 2012, the Discharger submitted an amended Report of Waste Discharge (ROWD) for the landfill. Some of the information in the amended ROWD has been used in revising these waste discharge requirements (WDRs). The amended ROWD contains the applicable information required in Title 27. However, Central Valley Water Board staff does not concur with the conclusions made in the amended ROWD regarding whether the current water quality monitoring system complies with Title 27 requirements, as described later in this Order. Revisions of the WDRs include:
 - a. Information describing unauthorized changes made by the Discharger to the groundwater monitoring network in 2005 (See Findings 40 thru 45) whereby the Central Valley Water Board staff finds the Facility's Detection Monitoring Program (DMP) to be non-compliant with Title 27, CCR, §20415 (b)(1)(B)(3 thru 5) requirements, and
 - b. Recommendations by the Discharger to reevaluate the groundwater monitoring network to bring the DMP back into compliance with Title 27 requirements, and
 - c. A time schedule describing tasks that the Discharger must perform to evaluate the Water Quality Protection Standard and the Groundwater Monitoring System at the Facility in order to ensure the Facility complies with Title 27 requirements for Class III landfills.
6. The existing landfill unit authorized by this Order is described as follows:

<u>Unit</u>	<u>Area</u>	<u>Liner/LCRS¹ Components²</u>	<u>Unit Classification & Status</u>
#1	5 acres	unlined	Class III, closed

¹ LCRS – Leachate collection and removal system

² All liner systems are composite liner systems unless otherwise noted

7. On-site facilities at the Big Oak Flat (Groveland) Sanitary Landfill currently include: a landfill closure cover, a storm water runoff sedimentation pond, a groundwater monitoring network, a surface water monitoring system, a perimeter gas monitoring network, a passive landfill gas vent system, and a waste transfer station.
8. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated federal MSW regulations under the Resource Conservation and Recovery Act (RCRA), Subtitle D. These regulations are under 40 Code of Federal Regulations section 258, and are hereafter referred to as either "Subtitle D" in reference to the RCRA federal law that required the regulations or "40 C.F.R. section 258.XX". These regulations

apply to all California Class II and Class III landfills that accept MSW. State Water Board Resolution 93-62 requires the Central Valley Water Board to implement in WDRs for MSW landfills the applicable provisions of the federal MSW regulations that are necessary to protect water quality, and in particular the containment provisions and the provisions that are either more stringent or that do not exist in Title 27.

9. This Order implements the applicable regulations for discharges of solid waste to land through Prohibitions, Specifications, Provisions, and monitoring and reporting requirements. Prohibitions, Specifications, and Provisions are listed in Sections A through H of these WDRs below, and in the Standard Provisions and Reporting Requirements (SPRRs) dated January 2012 which are part of this Order. Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) No. R5-2013-0031 and in the SPRRs. In general, requirements that are either in regulation or otherwise apply to all MSW landfills are considered to be “standard” and are therefore in the SPRRs. Any site-specific changes to a requirement in the SPRRs are included in the applicable section (A through H) of these WDRs, and the requirement in the WDRs supersedes the requirement in the SPRRs.
10. Title 27 contains regulatory standards for discharges of solid waste promulgated by the State Water Board and the California Department of Resources Recovery and Recycling (CalRecycle). In certain instances, this Order cites CalRecycle regulatory sections. Title 27, section 20012 allows the Central Valley Water Board to cite CalRecycle regulations from Title 27 where necessary to protect water quality provided it does not duplicate or conflict with actions taken by the Local Enforcement Agency in charge of implementing CalRecycle’s regulations.

WASTE CLASSIFICATION

11. The existing landfill Unit initiated operation in 1965. The Facility began operating as a burn dump in 1967. Burning ceased in 1975 and the Facility was operated as a “canyon fill” landfill. By the end of 2000, the total waste volume was estimated to be 124,863 cubic yards. The Facility ceased accepting waste in May 2001 and formal closure was completed in late 2002.
12. On 31 October 1995, the Central Valley Water Board issued Order No. 95-247, in which the facility was classified as a Class III waste disposal site for the discharge of non-hazardous solid or inert wastes in accordance with the regulations in effect when the order was issued. These wastes may have included friable asbestos, a hazardous waste under Title 22 of the California Code of Regulations (CCR), but considered an inert waste that does not pose a threat to groundwater quality. Section 25143.7 of the Health and Safety Code permits the disposal of friable asbestos with the appropriate permit and provided the wastes are handled and disposed of in accordance with other applicable State and Federal statutes and regulations. This Order continues to classify the Unit as a Class III solid waste landfill in accordance with Title 27, CCR, §20005, et seq. (Title 27).

SITE DESCRIPTION

13. The Big Oak Flat (Groveland) Sanitary Landfill is a closed, Class III, municipal solid waste landfill in Tuolumne County. The Landfill is located in the foothill region of the Sierra Nevada range in an area of generally steep topography characterized by rock outcroppings. Pine and manzanita vegetation dominate the landscape. The landfill is situated at the upper end of a ravine near the apex of a knoll at an elevation of about 3,300 feet mean sea level (MSL) approximately two miles south of the unincorporated town of Groveland at the end of Merrell Road. The nearest named surface water is Little Jackass Creek, which is south of the landfill.
14. Land uses within one mile of the landfill include agriculture and low density housing (5-acre minimum). Currently, there are no structures within 1,000 feet of the landfill. The area near the landfill is undeveloped and rural in nature.
15. Information provided by the Discharger on 17 February 2013 from the Department of Water Resources (DWR) identified 39 municipal and domestic supply wells within one mile of the site. These wells are reported to tap fractures (17 -475 feet bgs) with varying yields. The municipal and domestic wells with Assessor Parcel Numbers (APNs) are shown on Attachment C, which is incorporated herein and made part of this Order by reference. However, the majority of domestic water is supplied by the Groveland Community Services District, which derives its water source from the underground Hetch Hetchy Mountain Tunnel. The Hetch Hetchy aqueduct is approximately 1,000 feet north of the facility. At least two intermittent surface springs have been observed within 1,000 feet of the facility.
16. Tuolumne County resides within the central portion of the Sierra Nevada geomorphic province and has been characterized by geology dating back to the Paleozoic Era (about 570 million years ago). A majority of the County's geology is composed of Mesozoic (about 250 million years ago to about 65 million years ago) granitic rocks that are overlain by continental volcanic and sedimentary rock from the Cenozoic Era (beginning about 65 million years ago and continuing to present time).
17. Uplift and gentle folding occurred in the Sierra Nevada region between about middle Permian and middle Jurassic time but most of the deformation of the region occurred during Late Jurassic and Early Cretaceous time. The predominant structural trend was formed in Late Jurassic time and resulted in the northwest strike and steep dip of the Mesozoic and Paleozoic strata that dominate the region. Axes of folds formed during this deformation plunge northwest and southeast at angles of less than 30 degrees. A second major deformation continued into the Early Cretaceous resulted in the major faults, pervasive shearing, and steeply plunging minor folds and lineations present in the area. The Melones Fault Zone is the closest major seismic structure to the landfill and is located about 2.5 miles to the southwest.

18. The California Geological Survey indicates the landfill is located within a northwesterly-trending band of Jurassic metasedimentary rocks that include phyllite, slate, metagraywacke, and metaconglomerate. Site documents indicate the site is located within the adjacent and slightly older Paleozoic-Jurassic Calaveras Formation. This difference in nomenclature is judged not particularly significant because the lower portion of the metasedimentary rocks and the upper portion of the Calaveras Formation are both Jurassic in age and both units contain similar metasedimentary slate, phyllite, and schist.
19. The Groveland Landfill site is characterized by a general lack of soil mantle and frequent rock outcroppings along the cut slope adjacent to the landfill to the northwest. Bedrock at the site is also exposed in an eroded drainage channel just outside the northwestern perimeter fence and locally in a cut bank immediately south of monitoring well GMW-3. In addition, bedrock is exposed in a number of the cuts along Merrill Road (the principal road to the landfill). Bedrock exposed at the ground surface consists of steeply-dipping, fissile (very thinly bedded) metamorphosed slate, phyllite, and occasional schist that strike to the northwest and dip as part of the regional homoclinal structure about 75 to 82 degrees to the northeast. The individual units vary in thickness from less than 1 inch to massive (i.e. no apparent bedding). The fissile units break apart into intact "plates" under a moderate hammer blow. The relatively massive units are hard and resist hammering. Quartz veins and/or veinlets were not observed in outcrop but are assumed to be at least locally present based on relatively pure quartz fragments noted in the eroded drainage channel. Bedrock exposed at the ground surface is lightly to moderately oxidized and only slightly weathered. Boring logs indicate that the zone of oxidation and weathering extends to a depth of about 15 feet in GMW-1A, 12 feet in GMW-2, and 10 feet in GMW-3.
20. The intact underlying rock is dense and indurated and exhibits no discernible primary porosity. Except immediately at the ground surface, the individual bedding planes are tight and closed. Bedrock fracturing and jointing is infrequent and poorly defined at the site although an indistinct set of orthogonal joints that are subhorizontal and approximately normal to the bedrock trend were noted. All fracture surfaces observed in the field were tight and closed. When broken apart, the surfaces were smooth and no infilling or secondary mineralization or clay associated with weathering was associated with the bedrock discontinuities.
21. The bedrock is overlain by a thin veneer of residual and colluvial soil derived from the underlying bedrock. Based on laboratory testing, the soil consists primarily of a surficial layer of organic topsoil and an underlying layer of low plasticity sandy silt (ML in accordance with the Unified Soil Classification System) with between 53 percent and 69 percent of the soil finer than the No. 200 sieve. According one report the depth of soil cover across the site varies from several inches to as much as four feet.
22. Based on a site-specific seismic analysis dated 22 October 2001, the controlling maximum probable earthquake (MPE) for the site is a moment of magnitude 5.2 event along the Foothills Fault System, at a closest rupture distance of 15 miles from the site. It is estimated that a MPE event would produce a peak ground acceleration of 0.10g at the site with a return period of 100 years.

23. The Facility receives an average of 36 inches of precipitation per year as measured at the city of Groveland and the mean evaporation is 64 inches per year as measured at the Don Pedro Reservoir about 7 miles southwest of the site. The landfill is located above the snowline and receives precipitation in the form of snow as well.
24. The 100-year, 24-hour precipitation event for the Facility is estimated to be 9.16 inches, based on the National Oceanic and Atmospheric Administration (NOAA 2012) Atlas 14, Volume 6, Version 2 for nearby Groveland.
25. The waste management Facility is not within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM), Community-Panel Number 06109C1225C effective 16 April 2009.
26. A storm water sedimentation basin is located at the toe of the landfill as shown on Attachment B. The basin detains storm water for sedimentation control during the rainy season and is normally dry during the summer months. The sedimentation basin during overflow conditions can discharge to an unnamed tributary that drains southerly to Little Jackass Creek. The Facility is permitted (WDID# 5S551001874) to discharge storm water to surface waters under a separate WDRs 97-03-DWQ Order, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities* (NPDES General Permit CAS000001).

SURFACE WATER AND GROUNDWATER CONDITIONS

27. The *Water Quality Control Plan for Sacramento and San Joaquin River Basins, Fourth Edition* (hereafter Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
28. Seasonal surface water runoff from the landfill is to an unnamed tributary that drains southerly to Little Jackass Creek. Little Jackass Creek flows into Big Jackass Creek, which then drains into Moccasin. Moccasin Creek merges with the Tuolumne River at the [New] Don Pedro Reservoir.
29. The landfill is within the western side of the Sierra Nevada Range. The designated beneficial uses of the source to [New] Don Pedro Reservoir (by inference source means tributary streams, including Little Jackass Creek, Big Jackass Creek, and Moccasin Creek), as specified in the Basin Plan, are municipal and domestic supply, agriculture, industrial power supply, water contact and non-contact recreation, warm and cold fresh water habitat, and wildlife habitat.
30. Previous site documents (EBA Wastechologies, Water Quality Solid Assessment Test Report (SWAT Report) dated September 1991 and the Final Closure and Post Closure Maintenance Plan (JTD) dated October 2001) suggest that the upper zone of weathered bedrock is more permeable than the underlying rock and that seasonal perched groundwater conditions may occur at the landfill. Site conditions and the boring logs indicate the weathered zone is thin and only ranges from about 10 to about 15 feet thick.

As result, perched groundwater, if it were to occur, would likely be a short duration occurrence in response to precipitation. The current Groundwater Monitoring System does not monitor for seasonal perched groundwater at the interface between the weathered and unweathered bedrock. This Order in Section H.8 requires the Discharger to evaluate detection monitoring of seasonal perched groundwater at the weathered-unweathered bedrock interface.

31. Two natural springs (GS-1 and GS-2) as shown on Attachment C are located respectively 240 feet west-southwest and 1200 feet south of the landfill. Figure 1 of the SWAT Report places GS-1 at approximately 3170 feet MSL and GS-2 at approximately 3100 feet MSL. The seasonal springs were originally presumed as downgradient groundwater monitoring points with maximum flow rates of 3 gallons per minute (gpm) at GS-1 and 7 gpm at GS-2. Maximum spring discharges are typically observed in the month of March, and both springs are dry in the summer and fall. In 1990, springs GS-1 and GS-2 were replaced with downgradient monitoring wells GMW-2 and GMW-3. Shortly thereafter, the Discharger discontinued monitoring GS-2 but continues to monitor GS-1. Title 27, section 21750(g)(5), requires the Discharger to provide a map showing the location of all springs within the waste management facility and within one mile of its perimeter. This Order requires the Discharger to provide as part of the revised Water Quality Monitoring Plan such information on all seasonal springs to determine whether additional monitoring locations are necessary.
32. The depth to groundwater and groundwater elevations suggest a southwesterly flow direction that approximately follows topography and fracture orientation. Groundwater elevation varies seasonally at upgradient background well GMW-1A between 3256 to 3273 feet MSL. Groundwater elevation varies seasonally at downgradient compliance well GMW-2 between 3210 to 3225 feet MSL. Groundwater elevation varies seasonally at downgradient compliance well GMW-3 between 3214 to 3237 feet MSL, but these reported groundwater elevations may be in error due to the discrepancies in elevation, as described in Finding 34.
33. Site data indicate the gradient at the site is on the order of 0.06 feet/ft based on reported groundwater elevations. Because the site is underlain by fractured bedrock, it is possible that groundwater flows preferentially along bedrock joints and fractures in directions that differ from a predominantly southwesterly flow direction.
34. In Table 3 of the first 2012 semiannual monitoring report the Discharger reports the monitoring point (MP) elevations of GMW-2 and GMW-3 at 3248.17 feet and 3296.12 feet respectively. In the same monitoring report in Figure 4 the Discharger depicts the MP elevations of GMW-2 and GMW-3 at approximately 3203 feet and 3248 feet respectively, a discrepancy of approximately 45 feet in elevation. This Order requires the Discharger to reconcile the discrepancy and submit a report as indicated in Section H.8.
35. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are domestic and municipal water supply, agricultural supply, and industrial supply.

SURFACE WATER MONITORING

36. Surface water runoff after storm events is sampled at three locations downslope from the landfill. Surface water sample location GLC-1 is within the Groveland Landfill Creek as shown in Attachment B. Locations LJC-1 and LJC-2 are within Little Jackass Creek approximately $\frac{3}{4}$ miles south of the landfill as shown in Attachment C. Location LJC-1 is upstream of the confluence with Groveland Landfill Creek, whereas location of LJC-2 is downstream of the confluence. This Order requires the Discharger to reevaluate the effectiveness of surface water monitoring points LJC-1 and LJC-2 and whether other alternative locations exist closer to the landfill that are more appropriate and effective surface water monitoring locations. The Facility is currently permitted (WDID# 5S55I001874) to discharge storm water to surface waters under a separate WDRs 97-03-DWQ Order, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities* (NPDES General Permit CAS000001).

UNSATURATED (VADOSE) AND GROUNDWATER ZONE MONITORING

37. There is no vadose zone monitoring associated with the landfill. The Central Valley Water Board granted exemption to vadose zone monitoring on 2 October 1989, because the landfill is unlined and was determined not practical to perform this type of monitoring.
38. The existing groundwater monitoring system includes three wells screened at varying depths based on the well boring logs. These wells are identified as GMW-1A, GMW-2, and GMW-3. GMW-1A represents the background well and was completed in January 2000 replacing former monitoring well GMW-1. The depth of the well is 161 feet below ground surface (bgs). GMW-1A is screened in the uppermost productive fracture zone between 145 and 160 feet bgs. Static water level in GMW-1A varies between 73 and 83 feet below the top of the casing. GMW-1A is located approximately 700 feet north of downgradient compliance well GMW-3. GMW-2 and GMW-3 represent downgradient compliance wells.
39. Groundwater monitoring well GMW-2 was originally installed in July 1990 to a depth of 250 feet bgs. The well was originally completed as an open-hole hard rock well with a boring diameter of 6 inches and with a sanitary seal extending from the surface to 32 feet bgs. The well monitored groundwater extracted from fractures in the dark-gray slates of the Calaveras Formation. Airlift development following drilling indicated a yield of 2.1 gpm. The well was favorably situated to monitor ground water within the slate bedrock downslope and to the west of the Big Oak Flat Landfill.
40. Groundwater monitoring well GMW-2 was rehabilitated on 12 August 2005 without prior Central Valley Water Board concurrence (See Findings 58 thru 61). The rehabilitation involved installing 2-inch casing and screen within the existing 6 inch well bore and placing sand filter material in the annulus. Three separate screened sections were placed opposite productive fracture zones. Number 3 Monterey sand was placed in the annulus opposite each screened section and the individual screened sections were isolated from each other with installation of 4 to 8.5 feet of bentonite seal material in the annulus. The

well screens were located between 34 and 54 feet bgs, between 164 and 184 feet bgs, and between 214 and 229 feet bgs. Bentonite seals were located from 2 to 6 feet bgs, 24 to 32.5 feet bgs, 60 to 65.7 feet bgs, 147 to 155 feet bgs, and 189 to 195 feet bgs.

41. Prior to the well rehabilitation of GMW-2 in August 2005, a dedicated ½ HP submersible pump had been installed at the base of the open boring to permit purging and sampling for inorganic constituents. At the time the well was rehabilitated the former pump was removed and replaced with a dedicated variable-speed submersible pump before the fourth quarter 2005 sampling event. The variable speed pump was replaced with a dedicated stainless steel bladder pump before the second quarter 2006. The well has been sampled using low-flow sampling with the pump intake set opposite the uppermost fracture zone (45 feet bgs) since the second quarter 2006. Prior to the second quarter 2006, the well was sampled using standard purge and sampling protocols. The potentiometric surface of the ground water measured at GMW-2 varies seasonally and ranges between 23 and 38 feet below the top of the well casing.
42. Groundwater monitoring well GMW-3 was originally installed in July 1990 to a depth of 225 feet bgs. The well was originally completed as an open-hole hard rock well with a boring diameter of 6 inches between 100 and 225 feet bgs. This well monitored groundwater extracted from fractures in the dark-gray slates of the Calaveras Formation. Airlift development following drilling indicated a yield of 3.6 gpm. The well is favorably situated to monitor ground water within the slate bedrock along strike to the south of the Big Oak Flat Landfill. Due to caving ground, the well was over bored to a diameter of 8 inches to a depth of 100 feet bgs and PVC casing was placed to this depth. A sanitary seal was placed from the surface to a depth of 30 feet bgs and the casing was perforated between 60 and 100 feet bgs to allow for shallow groundwater monitoring of zones of saturation, zones of perched water, and areas of highest hydraulic conductivity per Title 27 Section 20415(b)(B)(3 thru 5).
43. This well was rehabilitated on 11 August 2005 without prior Central Valley Water Board concurrence (See Findings 58 thru 61). The rehabilitation involved installing 2-inch casing and screen within the existing well bore and placing sand filter material in the annulus. Two separate screened sections were placed opposite productive fracture zones. Number 3 Monterey sand was placed in the annulus opposite each screened section and the individual screened sections were isolated from each other with installation of 5-foot thick bentonite seals. During rehabilitation, screening at 60 to 100 bgs depth was omitted. Instead, well screens were located between 160 and 180 feet bgs and between 200 and 220 feet bgs. Bentonite seals are located from 20 to 25 feet bgs, 100 to 104 feet bgs, 150 to 155 feet bgs, and 190 to 195 feet bgs.
44. Prior to the well rehabilitation in August 2005, a dedicated 1/2-HP submersible pump was installed at the base of the boring to permit purging and sampling for inorganic constituents and a 2-inch diameter perforated PVC casing was installed (no glues) in order to permit sounding water levels and sampling for organics via disposable bailers. The ½-HP submersible pump was removed in August 2005 and replaced with a dedicated variable-speed submersible pump. The variable-speed pump was replaced with a

dedicated stainless steel bladder pump before the fourth quarter 2007 sampling event. The intake of this pump was installed at the fracture zone, which is at a depth of 170 feet bgs in the well. Low flow sampling procedures began at GMW-3 in first quarter 2007. Prior to the first quarter 2007, the well was sampled using standard purge and sampling protocols. The potentiometric surface of the ground water measured at GMW-3 varies seasonally and ranges between 62 and 82 feet below the top of the well casing.

45. Currently, the Discharger's detection monitoring program for groundwater monitoring at the landfill does not meet the requirements contained in Title 27 due to unauthorized changes to the groundwater monitoring system for detection monitoring (See Findings 40 thru 44). Furthermore, groundwater monitoring wells GMW-2, and GMW-3 do not meet the DWR Well Standards for monitoring wells, due to the fact that the wells are screened across multiple intervals as described in Finding 58 thru 61. Attachment B shows the locations of the groundwater monitoring wells.
46. Volatile organic compounds (VOCs) are often detected in a release from a MSW landfill and are often associated with releases of landfill gas rather than leachate. Since volatile organic compounds are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a landfill unit. Title 27, sections 20415(e)(8) and (9) allows the use of a non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a landfill unit in accordance with Title 27, sections 20415(b)(1)(B)2-4. However, Title 27 does not specify a specific method for non-statistical evaluation of monitoring data.
47. The Central Valley Water Board may specify a non-statistical data analysis method pursuant to Title 27, section 20080(a)(1). Water Code section 13360(a)(1) allows the Central Valley Water Board to specify requirements to protect groundwater or surface waters from leakage from a solid waste site, which includes a method to provide the best assurance of determining the earliest possible detection of a release.
48. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a landfill unit, the SPRRs specify a non-statistical method for the evaluation of monitoring data for non-naturally occurring compounds. The specified non-statistical method for evaluation of monitoring data provides two criteria (or triggers) for making the determination that there has been a release of non-naturally occurring waste constituents from a landfill unit. The presence of two non-naturally occurring waste constituents above their respective method detection limit (MDL), or one non-naturally occurring waste constituent detected above its practical quantitation limit (PQL) [a.k.a, laboratory reporting limit (RL)], indicates that a release of waste from a Unit has occurred. Following an indication of a release, verification testing must be conducted to determine whether there has been a release from the landfill unit or the detection was a false detection. The detection of two non-naturally occurring waste constituents above the MDL as a trigger is appropriate due to the higher risk of false-positive analytical results and the corresponding increase in sampling and analytical

expenses from the use of one non-naturally occurring waste constituent above its MDL as a trigger.

49. For a naturally occurring constituent of concern, the Title 27 requires concentration limits for each constituent of concern be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or
- b. By an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).

50. The Discharger submitted a Water Quality Protection Standard (WQPS) report dated March 1993 proposing statistical data analysis methods to calculate concentration limits for each monitored constituent in accordance with Title 27. The WQPS report was updated in first quarter 1995 to establish upper tolerance levels for constituents of concern. The WQPS report proposed to use intrawell data analysis to calculate tolerance limits for the monitored constituents. The WQPS and approved data evaluation methods are included in MRP No. R5-2013-0031.

51. There is no vadose zone monitoring associated with the landfill. In lieu of a vadose zone monitoring system the Facility utilizes four perimeter landfill gas probes GP-1 thru GP-4 which monitor landfill gas at three different depths for offsite landfill gas migration in compliance with Title 27, section 20919.5(1) and section 20919.5(2).

GROUNDWATER CONDITIONS (OR DEGRADATION AND CORRECTIVE ACTION)

52. The Big Oak Flat (Groveland) landfill originated as a burn site in 1965 and operated as such for approximately 10 years. Thereafter the landfill was converted to both a trench and area fill operation. The Central Valley Water Board issued Waste Discharge Requirements (WDRs) in May 1967 (Resolution No. 67-129) and revised WDRs in June 1988 (Order No. 88-112)

53. A ground water monitoring program was initiated in November 1988 under WDRs No. 88-112. The ground water monitoring system consisted of downgradient ground water monitoring locations represented by two natural springs GS-1 and GS-2 located approximately 250 feet westward and 1000 feet southward from the landfill.

54. In July 1990 the two spring sample locations GS-1 and GS-2 (see Finding 31) were replaced by two downgradient ground water monitoring locations GMW-2 and GMW-3. The upgradient well GMW-1 was established at a private residence approximately 2000 feet north-northwest of the landfill property.

55. A Water Quality Solid Waste Assessment Test (SWAT) Report was prepared in September 1991 based on groundwater monitoring results at the landfill. The SWAT report found evidence of leakage of six EPA 601 constituents detected at downgradient spring GS-1 and downgradient monitoring wells GMW-2 and GMW-3. 1,2-Dichloroethane

exceeded the minimum established water quality drinking standards at GS-1. Other constituents detected were Dichlorodifluoromethane, 1,1-Dichloroethane, 1,1,1-Trichloroethane, and Trichlorofluoromethane. Furthermore, general minerals and ICAP metals analysis test results showed relatively elevated concentrations in downgradient groundwater and surface water compared to the background analysis.

56. In March 1993 a Corrective Action Plan and Water Quality Monitoring Plan was prepared to address groundwater contamination and to provide a schedule for implementation of corrective actions. The corrective actions proposed included closure of the facility, minimization of leachate generation, and leachate capture, and installation of a final closure cover. The County prepared a Preliminary Closure Plan for planned closure in 2001.
57. In October 2000 the County prepared a Final Closure and Post-Closure Maintenance Plan. As an approved corrective action a final closure cover was placed over the landfill in late 2002. Groundwater monitoring wells continued to detect VOCs such as 1,1-Dichloroethane in downgradient wells GMW-2 and GMW-3 above the Practical Quantitation Limit (PQL). Trace concentrations of other VOCs such as dichlorodifluoromethane, toluene, chloroethane and carbon disulfide were also reported present in downgradient groundwater monitoring wells.
58. In August 2005 without prior authorization from the Central Valley Water Board the Discharger rehabilitated downgradient groundwater monitoring wells GMW-2 and GMW-3. In the process of rehabilitating the wells the Discharger changed the well configuration e.g. well screen locations, pump depth location, and pump type (high flow to low flow).
59. Following the rehabilitation of GMW-2 and GMW-3 the Discharger in its quarterly monitoring reports reported significant improvement in groundwater quality as many VOCs previously detected in trace values were now undetectable. Furthermore, VOCs reported above the PQL were now only detected intermittently as trace values.
60. On 30 March 2011 the Discharger requested reduction in monitoring frequency from quarterly to semiannually. Justification for reduction in monitoring frequency was based on the noticeable reduction in VOCs detected in downgradient groundwater monitoring wells. Based on monitoring results submitted by the Discharger the Central Valley Water Board staff granted on 18 May 2011 the reduction in monitoring frequency.
61. Upon periodic review of WDRs in preparation for issuing revised WDRs, Central Valley Water Board staff discovered the unauthorized changes made to downgradient groundwater monitoring wells GMW-2 and GMW-3 (See Findings 40, 43 and 58). On 11 January 2012 Central Valley Water Board staff notified the Discharger that the current site monitoring may not comply with Title 27 Section 20415 Detection Monitoring Program (DMP).

62. On 10 February 2012 the Discharger responded to the 11 January 2012 letter describing how it believes that the current groundwater monitoring system at the facility complies with Title 27 requirements.
63. On 30 March 2012 Central Valley Water Board staff issued a Notice of Violation (NOV) for existing conditions regarding the groundwater monitoring system that are contrary to current WDRs. The NOV identified six violations. The NOV required the Discharger to submit an amended Report of Waste Discharge (ROWD) describing how the Discharger will make appropriate changes to the monitoring system such that the detection monitoring system complies with Title 27 requirements.
64. Violation 4 from the 30 March 2012 NOV stated that Monitoring well GMW-2 did not monitor a discrete zone. The Discharger stated that "well screens are located adjacent to fractures between 34 and 54 feet, between 164 and 184 feet, and between 214 and 229 feet. The screened intervals are separated by bentonite seals." However, the described configuration provides only one well casing with multiple screen intervals allowing for groundwater from the different screened intervals to mix. The Department of Water Resources (DWR) Well Standards recognizes two scenarios for monitoring multiple zones. A monitoring well may be "nested" by using one borehole for multiple well casings with sealed discrete monitoring intervals, or wells may be installed as a cluster with individual well casings installed to different depths in close proximity. GMW-2 does not meet the DWR Well Standards. Furthermore, the design and construction of monitoring well GMW-2 does not comply with Section 20415(b)(1)(A) of Title 27 which states: "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."
65. Violation 5 from the 30 March 2012 NOV stated that Monitoring well GMW-3 is not monitoring a discrete zone. The Discharger states that the well screen intervals for this well are now located adjacent to water producing fractures between 160 and 180 feet, between 200 and 220 feet. As described in Finding 64 above, monitoring well GMW-3 also does not meet DWR Well Standards for a monitoring well design nor does it comply with Section 20415(b)(1)(A) of Title 27.
66. On 1 July 2012 the Discharger submitted an amended ROWD in response to the 30 March 2012 NOV describing current site geological and hydrogeological conditions. The amended ROWD also evaluated the existing monitoring well network relative to Title 27 requirements. The amended ROWD concluded that the existing groundwater monitoring system "generally complies with CCR Title 27 criteria for a Detection Monitoring System."
67. However, this Order finds that the existing groundwater monitoring system does not comply with Title 27 criteria for a Detection Monitoring System due to unauthorized changes to the water quality monitoring system that may have resulted in false indications of water quality improvements in underlying groundwater at the facility. This Order requires the Discharger to submit a revised Water Quality Monitoring Plan, a Site Survey Report, and a Storm Water Sedimentation Basin Analysis Report (see Section H.8

Provisions). This Order also requires that the Discharger install an appropriate Detection Monitoring Network.

LANDFILL GAS EXTRACTION SYSTEM

68. A landfill gas extraction system does not exist at the landfill. To protect the landfill cover a landfill gas passive vent system exists to prevent excessive landfill gas pressure from developing below the final landfill cover.

CONSTRUCTION AND ENGINEERED ALTERNATIVE

69. On 17 June 1993, the State Water Board adopted Resolution 93-62 implementing a State Policy for the construction, monitoring, and operation of municipal solid waste landfills that is consistent with the federal municipal solid waste regulations promulgated under 40 Code of Federal Regulations section 258 (a.k.a, Subtitle D). Resolution 93-62 requires the construction of a specified composite liner system at new municipal solid waste landfills, or expansion areas of existing municipal solid waste landfills, that receive wastes after 9 October 1993. Resolution 93-62 also allows the Central Valley Water Board to consider the approval of engineered alternatives to the prescriptive standard. Section III.A.b. of Resolution 93-62 requires that the engineered alternative liner systems be of a composite design similar to the prescriptive standard.

70. Title 27, section 20080(b) allows the Central Valley Water Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in accordance with Title 27, sections 20080(c)(1) and (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in Title 27, section 20080(b), or would be impractical and would not promote attainment of applicable performance standards. The Discharger must also demonstrate that the proposed engineered alternative liner or cover system is consistent with the performance goal addressed by the particular prescriptive standard, and provides protection against water quality impairment equivalent to the prescriptive standard in accordance with Title 27, section 20080(b)(2). The Discharger proposed an engineered alternative to the prescriptive standard for the landfill final closure cover. The final closure cover is described in Findings 77 thru 81.

71. Water Code section 13360(a)(1) allows the Central Valley Water Board to specify the design, type of construction, and/or particular manner in which compliance must be met in waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.

72. The Central Valley Water Board granted an exemption to unsaturated (vadose) zone monitoring on 2 October 1989. Migration of landfill gas from the site is monitored in compliance with Title 27, section 20919.5(1) and section 20919.5(2) at four perimeter probes GP-1 thru GP-4 at three different depths.

73. The Discharger performed a slope stability analysis dated 22 October 2001 for the final cover pursuant to Title 27, section 21750(f)(5). The slope stability analysis determined that for an earthquake of magnitude 5.2 and peak ground acceleration in rock of 0.10g there is zero expected displacement in the cover. RCRA Subtitle D (258) provides a maximum allowable permanent displacement of 6 to 12 inches. The Discharger's stability analysis includes components to demonstrate the integrity of the landfill final cover under both static and dynamic conditions throughout the landfill's closure period and post-closure maintenance period. The stability analysis demonstrates that the structural components of landfill final cover will withstand the forces of the Maximum Probable Earthquake (MPE) without failure of the landfill final cover.

LANDFILL CLOSURE

74. Title 27, section 21090 provides the minimum prescriptive final cover components for landfills consisting of, in ascending order, the following layers:

- a. Two-foot soil foundation layer.
- b. One-foot soil low flow-hydraulic conductivity layer, less than 1×10^{-6} cm/s or equal to the hydraulic conductivity of any bottom liner system.
- c. Geomembrane layer (this layer is required for composite-lined landfills for equivalency to bottom liner).
- d. One-foot soil erosion resistant/vegetative layer.

75. Title 27 allows engineered alternative final covers provided the alternative design will provide a correspondingly low flow-through rate throughout the post-closure maintenance period.

76. The Discharger submitted a Final Closure and Post-Closure Maintenance Plan (Revision 3 May 2002) requesting approval of an engineered alternative to the cover requirements. The engineered alternative proposed incorporating the use of 60-mil low linear density polyethylene (LLDPE) in the final cover section.

77. The Discharger proposed an engineered alternative final cover for the entire landfill Unit consisting of, in ascending order, the following layers:

- a. a minimum of two-feet thick foundation layer comprised of on-site soils (prescriptive per Title 27, CCR §21090(a)(1));
- b. a 60-mil thick textured (on both sides) LLDPE geomembrane barrier layer, overlain with a cushion of non-woven geotextile, and a composite of LLDPE geonet/non-woven geotextile drainage strips (proposed engineered alternative per Title 27, CCR §20080(b));
- c. and a minimum of one-foot thick vegetative soil layer comprised of on-site soils (prescriptive per Title 27, CCR §21090(a)(A)(1)).

78. The Discharger adequately demonstrated that construction of a Subtitle D and a Title 27 prescriptive standard cover would be unreasonable and unnecessarily burdensome when compared to the proposed engineered alternative design since there is no clay source on-site or nearby and the cost of importing clay from off-site or mixing on-site soils with bentonite would cost substantially more than the alternative design. The Discharger has demonstrated that the engineered alternative final cover meets the performance goals of Title 27 and that it is equivalent to the prescriptive standard.
79. The landfill was capped and closed in accordance with a Final Closure and Post-Closure Maintenance Plan (Revision 3) for the Facility dated May 2002. The County completed installation of the closure cap and cover in late 2002.
80. Side slopes for the closed landfill were sloped at maximum 3H:1V and included 15-foot wide benches every 50 vertical feet as required by Title 27.
81. Title 27 section 21090(a) requires that a slope stability analysis be performed for any final cover having a geosynthetic component. The Discharger performed a slope stability analysis for the final cover dated 22 October 2001. The Discharger's static and dynamic stability analysis demonstrated that the side slopes of the final cover will be stable in accordance with the requirements of Title 27.
82. Pursuant to Title 27, section 21090(e)(1), this Order requires a survey of the final cover following closure activities for later comparison with iso-settlement surveys required to be conducted every five years.

LANDFILL POST-CLOSURE MAINTENANCE

83. The Discharger submitted a final *Closure and Post-Closure Maintenance Plan* (Revision 3, dated May 2002) for closure and post-closure maintenance of all landfill units. The plan includes inspection, maintenance, and monitoring of the landfill during the post-closure maintenance period, and includes a post-closure maintenance cost estimate for the entire Facility. Inspection and maintenance includes the condition of the final cover, drainage features, groundwater monitoring wells, access roads, landfill gas system, and site security. The plan will be implemented for a minimum period of 30 years or until the waste no longer poses a threat to environmental quality, whichever is greater.
84. Once every five years during the post-closure maintenance period, aerial photographic maps of the closed landfill area will be made to identify and evaluate landfill settlement. Iso-settlement maps will be prepared to determine the amount of differential settlement occurring over the previous five years. Pursuant to Title 27, section 21090(e)(2), this Order requires iso-settlement maps to be prepared and submitted every five years.
85. The completed final cover will be periodically tested for damage or defects by monitoring surface emissions pursuant to California Code of Regulations, Title 17, section 95471(c) and Title 27, section 21090(a)(4)(A). Defects will be repaired and tested for adequacy based on the closure CQA Plan.

FINANCIAL ASSURANCES

86. Title 27, sections 21820 and 22206 require a cost estimate for landfill closure. The cost estimate must be equal to the cost of closing the landfill at the point in its active life when the extent and manner of operation would make closure the most expensive. When closing units in phases, the estimate may account for closing only the maximum area or unit of a landfill open at any time. The Discharger's *Closure and Post-Closure Maintenance Plan* (Revision 3, dated May 2002) includes a cost estimate for landfill closure. The lump sum estimate is for the cost to close largest future area needing closure at any one time. Since the landfill is closed the total amount of the closure cost estimate in 2012 dollars is zero. Title 27, sections 21840 and 22211 requires a cost estimate for landfill post-closure maintenance. The Discharger's *Closure and Post-Closure Maintenance Plan* (Revision 3, dated May 2002) includes a cost estimate for landfill post-closure maintenance. The amount of the cost estimate for post-closure maintenance in 2012 dollars is \$2.5 million. This Order requires that the Discharger maintain financial assurance with CalRecycle in at least the amount of the post-closure maintenance cost estimate adjusted annually for inflation. As of 2012, Discharger continues to use a dedicated Pledge of Revenues as financial assurances in lieu of maintaining a balance in a post-closure maintenance fund.

87. Title 27, section 22221 requires a cost estimate for corrective action of all known or reasonably foreseeable releases. The Discharger submitted a 28 August 2012 cost estimate of \$111,616 for corrective action of all known or reasonably foreseeable releases. This Order requires that the Discharger maintain financial assurance with the CalRecycle in at least the amount of the cost estimate adjusted annually for inflation. As of 2012, Discharger continues to use a Pledge of Revenue as financial assurances in lieu of maintaining a balance in a corrective action fund.

CEQA AND OTHER CONSIDERATIONS

88. The action to revise waste discharge requirements for this existing Facility is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resource Code section 21000, et seq., and the CEQA guidelines, in accordance with Title 14, section 15301.

89. This Order implements:

- a. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*;
- b. The prescriptive standards and performance goals of California Code of Regulations, title 27, section 20005 et seq., effective 18 July 1997, and subsequent revisions;
- c. State Water Board Resolution 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993, and revised on 21 July 2005.

- d. The applicable provisions of Title 40 C.F.R. section 258 "Subtitle D" federal regulations as required by State Water Board Resolution 93-62.
90. Based on the threat and complexity of the discharge, the Facility is determined to be classified 2-B as defined below:
- a. Category 2 threat to water quality, defined as, "*Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.*"
 - b. Category B complexity, defined as, "*Any discharger not included in Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management units.*"
91. Water Code section 13267(b) provides that: "In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharge or discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of having discharged or discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports."
92. The technical reports required by this Order and the attached "Monitoring and Reporting Program No. R5-2013-0031" are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the Facility that discharges the waste subject to this Order.

PROCEDURAL REQUIREMENTS

93. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
94. The Central Valley Water Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
95. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.
96. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and

California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date that this Order becomes final, except that if the thirtieth day following the date that this Order becomes final falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

IT IS HEREBY ORDERED, pursuant to California Water Code sections 13263 and 13267, that Order No. R5-2002-0142 is rescinded except for purposes of enforcement, and that Tuolumne County Community Resources Agency, its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of any waste as defined in Water Code section 13050(d) is prohibited.
2. The Discharger shall comply with all Standard Prohibitions listed in Section C of the Standard Provisions and Reporting Requirements (SPRRs) dated January 2012 which are attached hereto and made part of this Order by reference.

B. DISCHARGE SPECIFICATIONS

1. The Discharger shall not accept any new waste for disposal at this landfill Facility.
2. The Discharger shall comply with all Standard Discharge Specifications listed in Section D of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

C. FACILITY SPECIFICATIONS

1. The Discharger shall comply with all Standard Facility Specifications listed in Section E of the SPRRs dated January 2012 which are part of this Order.

D. CONSTRUCTION SPECIFICATIONS

1. The Discharger shall not proceed with construction, rehabilitation, or repair of the on-site facilities identified in Finding 7 excluding the waste transfer station until the construction plans, specifications, and all applicable construction quality assurance plans have been approved.

2. The Discharger shall comply with all Standard Construction Specifications listed in Section F of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.
3. The Discharger shall comply with all Storm Water Provisions listed in Section L of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

E. POST-CLOSURE MAINTENANCE SPECIFICATIONS

1. The Discharger shall obtain revised WDRs prior to making any changes to the final cover design other than the design or designs approved in this Order.
2. The Discharger shall maintain the landfill with side slopes at steepness of 3H:1V or less, and top deck areas shall be maintained and sloped at three percent or greater.
3. The Discharger shall ensure that the vegetative/erosion resistant layer receives necessary seed, binder, and nutrients to maintain the vegetation proposed in the final closure plan. The Discharger shall install and maintain necessary erosion and sedimentation controls to prevent erosion and sediment in runoff from the closed landfill during the period when the vegetation is not performing as designed in the final closure plan to minimize erosion and protect the final closure cover.
4. The Discharger shall comply with the final *Closure and Post-Closure Maintenance Plan* (Revision 3, dated May 2002) including any addendums and revisions, all Standard Closure and Post-Closure Specifications listed in Section G and all Standard Construction Specifications that are applicable to closure in Section F of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

F. FINANCIAL ASSURANCE SPECIFICATIONS

1. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for post-closure maintenance for the landfill in at least the amounts described in Findings 86 and 87, adjusted for inflation annually. A report regarding financial assurances for post-closure maintenance shall be submitted to the Central Valley Water Board by **1 June of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.
2. The Discharger shall update the closure and post-closure maintenance plan (CPCMP) any time there is a change that will increase the amount of the post-closure maintenance cost estimate. The updated CPCMP shall be submitted to the Central Valley Water Board, the Local Enforcement Agency, and CalRecycle. The CPCMP shall meet the requirements of Title 27, section 21769(b), and include a lump sum

estimate of the cost of carrying out all actions necessary to prepare detailed design specifications, to develop the final post-closure maintenance plan, and to carry out the first thirty years of post-closure maintenance. Reports regarding financial assurance required in F.1 above shall reflect the updated cost estimate.

3. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill in at least the amount of the annual inflation-adjusted cost estimate described in Finding 87. A report regarding financial assurances for corrective action shall be submitted to the Central Valley Water Board by **1 June of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.
4. The Discharger shall comply with all Standard Financial Assurance Specifications listed in Section H of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

G. MONITORING SPECIFICATIONS

1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, and surface water, and in accordance with Monitoring and Reporting Program (MRP) No. R5-2013-0031, and the Standard Monitoring Specifications listed in Section I of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.
2. The Discharger shall, for any landfill unit in a corrective action monitoring program, comply with the corrective action monitoring program provisions of Title 27, MRP No. R5-2013-0031, and the Standard Monitoring Specifications listed in Section I of SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.
3. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, MRP No. R5-2013-0031, and the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.
4. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the landfill unit that extends through the uppermost aquifer underlying the unit) shall not exceed the concentration limits established pursuant to MRP No. R5-2013-0031.
5. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in

MRP No. R5-2013-0031 and the Standard Monitoring Specifications in Section I of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

6. The Discharger shall comply with all Standard Monitoring Specifications and Response to a Release specifications listed in Sections I and J of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

H. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the Facility, including the MRP No. R5-2013-0031 and the SPRRs dated January 2012 which are part of this Order, and make it available at all times to Facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 and Subtitle D that are not specifically referred to in this Order.
3. The Discharger shall comply with all applicable water quality criteria/objectives pertaining to this Facility specified in the Water Code and the Basin Plan that are not explicitly addressed in this Order.
4. The Discharger shall comply with MRP No. R5-2013-0031, which is incorporated into and made part of this Order by reference.
5. The Discharger shall comply with the applicable portions of the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Subtitle D and/or Title 27*, dated January 2012, which are attached hereto and made part of this Order by reference.
6. If there is any conflicting or contradictory language between the WDRs, the MRP, or the SPRRs, then language in the WDRs shall supersede either the MRP or the SPRRs, and language in the MRP shall supersede the SPRRs.
7. All reports required by this Order shall be submitted pursuant to Water Code section 13267.
8. The Discharger shall complete the tasks contained in these waste discharge requirements in accordance with the following time schedule:

- a. By **1 September 2013**, the Discharger shall submit a *Groundwater and Surface Water Monitoring Network Workplan* that describes how the current groundwater detection monitoring network will be modified to comply with Title 27, Section 20415(b)(1)(B), and this Order. If new groundwater monitoring wells are proposed, then the Workplan shall include the information listed in the first section of Attachment D of this Order. The workplan shall be prepared by a registered professional with experience in groundwater monitoring. In addition, the following items must be addressed in the work plan:
1. The current wells GMW-2 and GMW-3 monitor multiple zones as explained in Findings 40 and 43, respectively. These monitoring wells must comply with the Department of Water Resources well standards for monitoring well installation, such that each well casing shall only monitor one unique water bearing interval. Consequently, the workplan must describe how the wells will be modified to monitor the current water bearing intervals (listed in Finding 40 and 43 of this Order) using isolated well screens.
 2. As identified on the wells boring logs, the current wells GMW-2 and GMW-3 do not monitor the interface between the weathered bedrock and the underlying bedrock. Title 27 Section 20415(b)(1)(B)(2 & 4) and this Order require that the monitoring network must monitor first encountered groundwater. Therefore, the workplan must include a plan for monitoring of this interval.
 3. An evaluation must be made to determine if monitoring well GMW-2 fulfills the point of compliance requirement of Title 27 Section 20405(a). The Discharger must also evaluate whether the percolation of stormwater has the potential to influence water quality monitored historically, or in the future, for monitoring well GMW-2. If the evaluation shows the well does not comply with Title 27 Section 20405(a) or is, or may be, influenced by the infiltration of stormwater from the adjacent pond, then the work plan shall propose an alternate well location or other alternatives such as but not limited to lining the detention pond.
 4. The workplan must to identify all springs that discharge within one mile from the facility, and contain a proposal for monitoring to determine if they are being impacted by discharges from the facility.
 5. Using historical monitoring data, the Discharger shall evaluate the effectiveness of surface water monitoring points LJC-1 and LJC-2 to determine if their location complies with Title 27 Section 20415(c). If the location are not appropriate, then the workplan shall propose alternate monitoring points.
- b. No later than **30 May 2014**, all new wells or groundwater monitoring intervals installed pursuant to this Order shall become part of the groundwater monitoring network and monitored as required by Section A.1 of the MRP, with the exception

that for the first monitoring event, samples shall be analyzed for all constituents listed on Table VI

- c. No later than **30 May 2014**, all springs identified in the survey shall become part of the surface water monitoring program required by Section A.4 of the MRP, and samples shall be analyzed for the constituents listed in Table IV of the MRP.
 - d. By **1 June 2014**, the Discharger shall submit a *Monitoring Network Upgrade Report* that describes the changes made to the groundwater monitoring network. If new wells have been installed, then the report shall include a well installation report, which contains the information listed in the second section of Attachment D.
 - e. By **1 June 2014**, the Discharger shall submit a site topographic survey report that documents the re-survey of the entire facility (all features listed in Finding 7) and all monitoring points listed in the MRP as well all springs that are within a mile of the facility. This survey report shall reconcile the discrepancies between elevations reported on the site topographic map and those reported in the groundwater monitoring reports. The survey must be performed and stamped by a California-licensed land surveyor registered in good standing with the California Board of Land Surveyors. The report shall include the data presented in an excel spreadsheet .xls format as well as illustrated on a topographic map.
9. The Discharger shall comply with Standard Provisions and Reporting Requirements, January 2012, which is a part of this Order.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 12 April 2013.

Original Signed By

PAMELA C. CREEDON, Executive Officer

vkj

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2013-0031
FOR
TUOLUMNE COUNTY COMMUNITY RESOURCES AGENCY
BIG OAK FLAT (GROVELAND) SANITARY LANDFILL
CLASS III MUNICIPAL SOLID WASTE LANDFILL
POST-CLOSURE MAINTENANCE,
AND CORRECTIVE ACTION
TUOLUMNE COUNTY

This monitoring and reporting program (MRP) is issued pursuant to California Water Code section 13267 and incorporates requirements for groundwater, surface water, and unsaturated zone monitoring and reporting; facility monitoring, maintenance, and reporting; and financial assurances reporting contained in California Code of Regulations, title 27, section 20005, et seq. (hereafter Title 27), Waste Discharge Requirements (WDRs) Order No. R5-2013-0031, and the Standard Provisions and Reporting Requirements (SPRRs) dated January 2012. Compliance with this MRP is ordered by the WDRs and the Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Central Valley Water Board or the Executive Officer.

A. MONITORING

The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, and surface water in accordance with Standard Monitoring Specifications in Section I of the SPRRs and the Monitoring Specifications in Section G of the WDRs. All monitoring shall be conducted in accordance with the approved **1993** *Sample Collection and Analysis Plan*, updated in first quarter 1995, which includes quality assurance/quality control standards.

All compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring program groundwater monitoring wells, leachate/seep, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern (COCs) as indicated and listed in Tables I through VI.

The Discharger may use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program, and are identified in the approved Sample Collection and Analysis Plan.

The monitoring program of this MRP includes:

<u>Section</u>	<u>Monitoring Program</u>
A.1	Groundwater Monitoring
A.2	Unsaturated Zone Monitoring (Not Applicable)
A.3	Leachate Monitoring, Seep Monitoring, and LCRS Testing
A.4	Surface Water Monitoring
A.5	Facility Monitoring
A.6	Corrective Action Monitoring

1. Groundwater Monitoring

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. The detection monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27. The current groundwater detection monitoring system does not meet the applicable requirements of Title 27 as described in Findings 40 thru 45, and 58 thru 61 in the WDRs.

The Discharger shall revise the groundwater detection monitoring system (after review and approval by Central Valley Water Board staff) as needed.

The current groundwater monitoring network consists of the following:

<u>Well</u>	<u>Status</u>	<u>Zone</u>	<u>Units Being Monitored</u>
GMW-1A	Background	Deep	# 1
GMW-2	Detection	Deep	# 1
GMW-3	Detection	Deep	# 1

Groundwater samples shall be collected from the background wells, detection monitoring wells, corrective action monitoring wells, and any additional wells added as part of the approved groundwater monitoring system. The collected samples shall be analyzed for the parameters and constituents listed in Table I in accordance with the specified methods and frequencies. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

Once per quarter, the Discharger shall measure the groundwater elevation in each well (during the same sampling event), determine groundwater flow direction, and estimate groundwater flow rates in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored. The results shall be reported semiannually, including the times of expected highest and lowest elevations of the water levels in the wells, pursuant to Title 27, section 20415(e)(15).

Samples collected for the COC monitoring specified in Table I shall be collected and analyzed in accordance with the methods listed in Table VI every five years. Five-year COCs were last monitored in the 1st Semester 2012 and shall be monitored again in 1st Semester **2017**. The results shall be reported in the Annual Monitoring Report for the year in which the samples were collected.

2. Unsaturated Zone Monitoring (Not Applicable)

There is no unsaturated zone monitoring associated with the landfill. The landfill is unlined and it is not practical to perform this type of monitoring. See Finding 37 in the WDR Order for additional information.

3. Seep Monitoring

Seep Monitoring: Leachate that seeps to the surface from a landfill unit shall be sampled and analyzed for the Field and Monitoring Parameters listed in Table III upon detection. The quantity of leachate shall be estimated and reported as Leachate Flow Rate (in gallons/day). Reporting for leachate seeps shall be conducted as required in Section B.4 of this MRP, below.

4. Surface Water Monitoring

The Discharger shall operate a surface water detection monitoring system for any landfill facility where runoff from landfill areas flows or could flow to waters of the United States. The monitoring system shall comply with the applicable provisions of Title 27, sections 20415 and 20420. At the Big Oak Flat Sanitary Landfill, runoff from landfill areas flows to a sediment pond that upon overflow discharges to Groveland Landfill Creek as permitted under a separate WDRs 97-03-DWQ Order, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities* (NPDES General Permit CAS000001). The current surface water detection monitoring system meets the applicable requirements of Title 27. However, the current surface water monitoring points LJC-1 and LJC-2 are located approximately $\frac{3}{4}$ mile south of the landfill and their effectiveness at detecting water quality impacts from the landfill is debatable. WDRs Order No. R5-2013-0031 Section H.8 requires the Discharger to reevaluate the surface water detection monitoring system to determine if additional/alternative surface water monitoring points are more effective in identifying surface water impacts. If so, then this MRP will be revised.

The current surface water monitoring points for the landfill are:

<u>Mon Pt.</u>	<u>Status</u>
LJC-1	Background or Upstream on Little Jackass Creek
LJC-2	Downstream or Compliance on Little Jackass Creek
GLC-1	Discharge or Compliance on Groveland Landfill Creek
GS-1	Discharge or Compliance from seasonal spring

For surface water detection monitoring, a sample shall be collected at each monitoring point location and analyzed for the monitoring parameters and constituents in accordance with the methods and frequency specified in Table IV. All surface water monitoring samples shall be collected and analyzed for the 5-year COCs specified in Table IV every five years, beginning again in the 1st Semester **2017**.

5. Facility Monitoring

a. Annual Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess repair and maintenance needed for drainage control systems, cover systems, and groundwater monitoring wells; and shall assess preparedness for winter conditions (including but not limited to erosion and sedimentation control). The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. Annual facility inspection reporting shall be submitted as required in Section B.5 of this MRP.

b. Major Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities and all landfill side slopes for damage **within 7 days** following major storm events capable of causing damage or significant erosion. A major storm event includes periods of rapid snow melt in which the site may experience increased snow melt runoff equivalent to a major precipitation storm event. The Discharger shall take photos of any problems areas before and after repairs. Necessary repairs shall be completed **within 30 days** of the inspection. Notification and reporting requirements for major storm events shall be conducted as required in Section B.6 of this MRP.

c. Five-Year Iso-Settlement Survey for Closed Units

The Discharger shall conduct a five-year iso-settlement survey and produce an iso-settlement map accurately depicting the estimated total change in elevation of each portion of the final cover's low-hydraulic-conductivity layer. For each portion of the landfill, this map shall show the total lowering of the surface elevation of the final cover, relative to the baseline topographic map [Title 27, section 21090(e)(1 & 2)]. Reporting shall be in accordance with Section B.7 of this MRP. The next iso-settlement survey shall be conducted in **2013**.

d. **Standard Observations**

The Discharger shall conduct Standard Observations at the landfill in accordance with this section of the MRP. Standard observations shall be conducted in accordance with the following schedule:

<u>Landfill Unit Type</u>	<u>Frequency</u>	<u>Season</u>
Inactive/Closed	Monthly	Wet: 1 October to 30 April
Inactive/Closed	Quarterly	Dry: 1 May to 30 September

The Standard Observations shall include:

- 1) For the landfill unit:
 - a) Evidence of ponded water at any point on the landfill outside of any contact storm water/leachate diversions structures on the active face (show affected area on map); and
 - b) Evidence of erosion and/or of day-lighted refuse.
- 2) Along the perimeter of the landfill unit:
 - a) Evidence of leachate seeps, estimated size of affected area, and flow rate (show affected area on map); and
 - b) Evidence of erosion and/or of day-lighted refuse.
- 3) For receiving waters:
 - a) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area; and
 - b) Discoloration and turbidity - description of color, source, and size of affected area.

Results of Standard Observations shall be submitted in the semiannual monitoring reports required in Section B.2 of this MRP.

6. Corrective Action Monitoring

The Discharger shall conduct corrective action monitoring to demonstrate the effectiveness of corrective action in accordance with Title 27, section 20430 and this MRP. Groundwater monitoring wells that are in a corrective action monitoring program shall be monitored in accordance with the groundwater monitoring requirements in parts A.1 and A.2 of this MRP, except as modified in this part of the MRP for any additional constituents or modified monitored frequencies.

B. REPORTING

The Discharger shall submit the following reports in accordance with the required schedule:

Reporting Schedule

<u>Section</u>	<u>Report</u>	<u>End of Reporting Period</u>	<u>Due Date</u>
B.1	Quarterly Monitoring	31 March	by Semiannual Schedule
		30 June	by Semiannual Schedule
		30 September	by Semiannual Schedule
		31 December	by Semiannual Schedule
B.2	Semiannual Monitoring	30 June	31 July
		31 December	31 January
B.3	Annual Monitoring Report	31 December	31 January
B.4	Seep Reporting	Continuous	Immediately & 7 Days
B.5	Annual Facility Inspection Report	31 October	15 November
B.6	Major Storm Event Reporting	Continuous	7 days from damage discovery
B.7	Survey and Iso-Settlement Map	31 December	31 January
B.8	Financial Assurances Report	31 December	1 June
B.9	Corrective Action Reports	As Required	As Required

Reporting Requirements

The Discharger shall submit monitoring reports **semiannually** with the data and information as required in this Monitoring and Reporting Program and as required in WDRs Order No. R5-2013-0031 and the Standard Provisions and Reporting Requirements (particularly Section I: "Standard Monitoring Specifications" and Section J: "Response to a Release"). In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste

discharge requirements or the lack thereof. Data shall also be submitted in a digital format, such as a computer disk.

Field and laboratory tests shall be reported in each monitoring report. Semiannual and annual monitoring reports shall be submitted to the Central Valley Water Board in accordance with the above schedule for the calendar period in which samples were taken or observations made. In addition, the Discharger shall enter all monitoring data and monitoring reports into the online Geotracker database as required by Division 3 of Title 27.

The results of **all monitoring** conducted at the site shall be reported to the Central Valley Water Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the post-closure period. Such records shall be legible and shall show the following for each sample:

- a) Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
- b) Date, time, and manner of sampling;
- c) Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
- d) Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
- e) Calculation of results; and
- f) Results of analyses, and the MDL and PQL for each analysis. All peaks shall be reported.

Required Reports

1. **Quarterly Monitoring Report:** Monitoring reports shall be submitted semiannually per the schedule and monitoring requirements specified in Section B.2.
2. **Semiannual Monitoring Report:** Monitoring reports shall be submitted semiannually and are due on **31 January and 31 July**. Each semiannual monitoring report shall contain at least the following:
 - a) For each groundwater monitoring point addressed by the report, a description of:
 - 1) The time of water level measurement;
 - 2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
 - 3) The method of purging used to stabilize water in the well bore before the sample is taken including the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; results of pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water;
 - 4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
 - 5) A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.
 - b) A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
 - c) The estimated quarterly groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored based upon water level elevations taken prior to the collection of the water quality data submitted in the report [Title 27, section 20415(e)(15)].
 - d) Cumulative tabulated monitoring data for all monitoring points and constituents for groundwater, unsaturated zone, leachate, and surface water. Concentrations below the reporting limit shall not be reported as "ND" unless the concentration is below the method detection limit and the method detection limit is also given in the table. Otherwise they shall be reported "<" the reporting limit (e.g., <0.10). Units shall be as required in Tables I through IV unless specific justification is given to report in other units. Refer to the SPRRs Section I "Standard Monitoring Specifications" for requirements regarding MDLs and PQLs.
 - e) Laboratory statements of results of all analyses evaluating compliance with requirements.

- f) An evaluation of the concentration of each monitoring parameter (or 5-year COC when five year COC sampling is conducted) as compared to the current concentration limits, and the results of any required verification testing for constituents exceeding a concentration limit. Report any actions taken under Section J: Response to a Release in the Standard Provisions and Reporting Requirements, January 2012, for verified exceedances of a concentration limit.
 - g) An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities. Include a summary of any instances where leachate depth on an MSW landfill liner system exceeded 30 cm (excluding the leachate sump), and information about the required notification and corrective action in Standard Facility Specification E.13 of the SPRRs.
 - h) A summary of all Standard Observations for the reporting period required in Section A.5.d of this MRP.
 - i) A summary of inspection, leak search, and repair of final covers on any closed landfill units in accordance with an approved final post-closure maintenance plan as required by Standard Closure and Post-Closure Maintenance Specifications G.26 through G.29 of the SPRRs.
3. **Annual Monitoring Report:** The Discharger shall submit an Annual Monitoring Report to the Central Valley Water Board by **31 January** covering the reporting period of the previous monitoring year. If desired, the Annual Monitoring Report may be combined with the 2nd semiannual report, but if so, shall clearly state that it is both a 2nd semiannual and annual monitoring report in its title. Each Annual Monitoring Report shall contain the following information:
- a) All monitoring parameters shall be graphed to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. If a 5-year COC event was performed, than these parameters shall also be graphically presented. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
 - b) An evaluation of the monitoring parameters with regards to the cation/anion balance, and a graphical presentation using a Stiff diagram, a Piper graph, or a Schoeller plot.
 - c) All historical monitoring data for which there are detectable results, including data for the previous year, shall be submitted in tabular form in a digital file format such as a computer disk. The Central Valley Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary

for..." statistical analysis [Title 27, section 20420(h)], that facilitates periodic review by the Central Valley Water Board.

- d) Hydrographs of each well showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.
 - e) A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
 - f) A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours, and include a projection of the year in which each discrete landfill module will be filled.
 - g) A written summary of the monitoring results, indicating any changes made or observed since the previous Annual Monitoring Report.
 - h) The results of the annual testing of leachate collection and removal systems required under Standard Facility Specification E.14 of the SPRRs.
 - i) Updated WQPS concentration limits for each monitoring parameter at each monitoring well based on the new data set.
 - j) A comprehensive discussion of any Corrective Action Program required by this MRP or a companion Order.
4. **Seep Reporting:** The Discharger shall report by telephone any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the Central Valley Water Board **within seven days**, containing at least the following information:
- a) A map showing the location(s) of seepage;
 - b) An estimate of the flow rate;
 - c) A description of the nature of the discharge (e.g., all pertinent observations and analyses);
 - d) Verification that samples have been submitted for analyses of the Field Parameters and Monitoring Parameters listed in Table III of this MRP, and an estimated date that the results will be submitted to the Central Valley Water Board; and
 - e) Corrective measures underway or proposed, and corresponding time schedule.
5. **Annual Facility Inspection Reporting:** By **15 November** of each year, the Discharger shall submit a report describing the results of the inspection and the

repair measures implemented, preparations for winter, and include photographs of any problem areas and the repairs. Refer to Section A.5.a of this MRP, above.

6. **Major Storm Event Reporting:** Following major storm events capable of causing damage or significant erosion, the Discharger **immediately** shall notify Central Valley Water Board staff of any damage or significant erosion upon discovery and report subsequent repairs within **14 days** of completion of the repairs, including photographs of the problem and the repairs. Refer to Section A.5.b of this MRP, above.
7. **Survey and Iso-Settlement Map for Closed Landfills:** The Discharger shall conduct a survey and submit an iso-settlement map for each closed area of the landfill every five years pursuant to Title 27, section 21090(e). Refer to Section A.5.c of this MRP, above. The next report is due by 31 January 2014.
8. **Financial Assurances Report:** By **1 June** of each year, the Discharger shall submit a copy of the annual financial assurances report due to CalRecycle that updates the financial assurances for closure, post-closure maintenance, and corrective action. Refer to Financial Assurances Specifications F.1 through F.3 of the WDRs.
9. **Corrective Action Report:** As required. The Discharger shall provide a report describing the results of corrective action monitoring, including interpretation of the results certified by a California-licensed professional civil engineer or geologist that concludes whether the corrective actions implemented by the Discharger is adequately addressing associated water quality impacts. The licensed professional shall provide an updated schedule based on corrective action monitoring when completion of correction will occur such that water quality protection standards are met.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For each waste management unit, the Water Quality Protection Standard shall consist of all COCs, the concentration limit for each constituent of concern, the verification retesting procedure to confirm measurably significant evidence of a release, the point of compliance, and all water quality monitoring points for each monitored medium.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the COCs, the concentration limits, and the point of compliance and all monitoring points. Any proposed changes to the Water Quality Protection Standard other than annual update of the concentration limits shall be submitted in a report for review and approval.

The report shall:

- a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a waste management unit or portion of a unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with Title 27, section 20405.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).
- d. Include a proposed statistical method for calculating concentration limits for monitoring parameters and constituents of concern that are detected in 10% or greater of the background data (naturally-occurring constituents) using a statistical procedure from Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E).
- e. Include a retesting procedure to confirm or deny measurably significant evidence of a release pursuant to Title 27, section 20415(e)(8)(E) and section 20420(j)(1-3).

The Water Quality Protection Standard shall be certified by a California-registered civil engineer or geologist as meeting the requirements of Title 27. If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

The Discharger proposed the methods for calculating concentration limits in the March 1993 *Water Quality Protection Standard Report*. The limits are calculated using intrawell tolerance coefficient at 95% confidence and 95% coverage based on historical background data from each well. Since the intrawell tolerance limit method has been approved each well provides its own background data. The Water Quality Protection Standard shall be updated annually for each monitoring well using new and historical monitoring data. The Water Quality Protection Standards shall not be calculated using data identified as outliers using the EPA 1989 Outlier Test or calculated using data that indicates an upward trend due to a release of COCs to receiving water. The Discharger shall not change the method for establishing concentration limits or

determining compliance with established concentration limits without prior written approval from the Central Valley Water Board.

2. Monitoring Parameters

Monitoring parameters are a select group of constituents that are monitored during each monitoring event that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a waste management unit. The monitoring parameters for all waste management units are those listed in Tables I through V for the specified monitored medium.

3. Constituents of Concern (COCs)

The COCs include a larger group of waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit, and are required to be monitored every five years [Title 27, sections 20395 and 20420(g)]. The COCs for all waste management units at the facility are those listed in Tables I through IV for the specified monitored medium, and Table VI. The Discharger shall monitor all COCs every five years, or more frequently as required in accordance with a Corrective Action Program. The last 5-year COC report was submitted to the Central Valley Water Board in the 2012 *Annual Monitoring Report*, and 5-year COCs are due to be monitored again in **2017**.

4. Concentration Limits

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or
- b. By an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).

The methods for calculating concentration limits were included in the 29 December 1993 *Water Quality Protection Standard Report*. The approved method uses intrawell tolerance coefficient at 95% confidence and 95% coverage based on historical background data from each well. Since the intrawell tolerance limit method has been approved each well provides its own background data. The Discharger shall not change the method for establishing concentration limits or determining compliance with established concentration limits without prior written approval from the Central Valley Water Board.

The Water Quality Protection Standards shall not be calculated using data identified as outliers using the EPA 1989 Outlier Test or calculated using data that indicates an upward trend due to a release of COCs to receiving water. The

most recent concentration limits calculated using the outlier and upward trend exclusion criteria stated above for select parameters are as follows:

Sampling Well	GMW-2	GMW-3	LJC-2	GLC-1	GS-1
Analysis Type	Intrawell	Intrawell	LJC-1 Interwell Comparison	LJC-1 Interwell Comparison	Intrawell
EC ¹ (umhos/cm)	633	503	312	229	171
Bicarbonate Alkalinity as CaCO ₃	169.2	206.3	33.66	33.66	33.66
Calcium	54	54	32.3		
Carbonate Alkalinity as CaCO ₃	2.5	2.5	2.5	2.5	2.5
Chloride (mg/L) ³	13.02	17.09	3.66	3.66	3.66
Magnesium (mg/L)	11.15	10.44	6.74	6.74	6.74
Nitrate as N (mg/L)	0.67	0.21	0.29	0.29	0.29
Potassium (mg/L)	5.35	4.59	27	27	27
Sodium (mg/L)	14.41	30.62	8.81	8.81	8.81
Sulfate (mg/L)	70	52.32	37.18	37.18	37.18
TDS ² (mg/L)	486	326	153	153	153
Turbidity (NTU)	14	43.1	53.3	53.3	20.62
pH (Units)	6.0-9.0	6.0-9.0	6.5-8.5	6.5-8.5	6.5-8.5
VOCs	Non Detect	Non Detect	Non Detect	Non Detect	Non Detect

Notes: The limits in bold are concentration limits that were set by the Discharger and not adjusted due to increasing trends e.g. evidence of a release. Concentration limits not in bold are concentration limits that RWQCB staff calculated after outliers were removed. Outliers should not be used to calculate concentration limits when concentration limits are used for detection monitoring.

¹ Electrical Conductivity

² Total Dissolved Solids

³ Milligrams per liter

5. Retesting Procedures for Confirming Evidence of a Release

If monitoring results indicate measurably significant evidence of a release, as described in Standard Monitoring Specification I.45 of the SPRRs, then:

- a. For analytes that are detected in less than 10% of the background samples (such as non-naturally occurring constituents), the Discharger shall use the non-statistical retesting procedure required in Standard Monitoring Specification I.46 of the SPRRs.
- b. For analytes that are detected in 10% or greater of the background samples (naturally occurring constituents), the Discharger shall use one of the statistical retesting procedure as required in Standard Monitoring Specification I.47 of the SPRRs.

6. Point of Compliance

The point of compliance for the water standard at each waste management unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the unit. The following are current monitoring locations at the point of compliance:

Point of Compliance Monitoring Wells

GMW-2

GMW-3

The current groundwater detection monitoring system does not meet the applicable requirements of Title 27 as described in Findings 40 thru 45, and 58 thru 61 in the WDRs. The points of compliance are subject to change as Discharger may propose and implement a new groundwater detection monitoring system per the WDRs Provisions Section H.8.

7. Compliance Period

The compliance period for each waste management unit shall be the number of years equal to the active life of the unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the waste management unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program [Title 27, section 20410].

8. Monitoring Points

A monitoring point is a well, device, or location specified in the waste discharge requirements, which monitoring is conducted and at which the water quality protection standard applies. The monitoring points for each monitored medium are listed in Section A of this MRP.

D. TRANSMITTAL LETTER FOR ALL REPORTS

A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report. The transmittal letter shall contain a statement by the discharger, or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate, and complete.

The Discharger shall implement the above monitoring program on the effective date of this Program.

Original Signed By

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

12 April 2013

(Date)

vkj

TABLE I
GROUNDWATER DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Field Parameters			
Groundwater Elevation	Ft. & 100ths, M.S.L.	Quarterly	Semiannual
Temperature	°C	Semiannual	Semiannual
Electrical Conductivity	umhos/cm	Semiannual	Semiannual
pH	pH units	Semiannual	Semiannual
Turbidity	Turbidity units	Semiannual	Semiannual
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L ¹	Semiannual	Semiannual
Chloride	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual	Semiannual
Sulfate	mg/L	Semiannual	Semiannual
Carbonate	mg/L	Semiannual	Semiannual
Bicarbonate	mg/L	Semiannual	Semiannual
Calcium	mg/L	Semiannual	Semiannual
Magnesium	mg/L	Semiannual	Semiannual
Potassium	mg/L	Semiannual	Semiannual
Sodium	mg/L	Semiannual	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L ²	Semiannual	Semiannual
5-Year Constituents of Concern (see Table VI)			
Total Organic Carbon	mg/L	5 years	1 st Quarter 2017
Inorganics (dissolved)	ug/L	5 years	and every 5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	5 years	thereafter
Semi-Volatile Organic Compounds (USEPA Method 8270D)	ug/L	5 years	" "
Chlorophenoxy Herbicides (USEPA Method 8151A)	ug/L	5 years	" "
Organophosphorus Compounds (USEPA Method 8141B)	ug/L	5 years	" "

¹ Milligrams per liter

² Micrograms per liter

TABLE II

UNSATURATED ZONE DETECTION MONITORING PROGRAM (NOT APPLICABLE)

TABLE III
SEEP MONITORING ¹

<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Field Parameters			
Total Flow	Gallons	See Note 1	See Note 1
Flow Rate	Gallons/Day	" "	" "
Electrical Conductivity	umhos/cm	" "	" "
pH	pH units	" "	" "
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L	See Note 1	See Note 1
Chloride	mg/L	" "	" "
Carbonate	mg/L	" "	" "
Bicarbonate	mg/L	" "	" "
Nitrate - Nitrogen	mg/L	" "	" "
Sulfate	mg/L	" "	" "
Calcium	mg/L	" "	" "
Magnesium	mg/L	" "	" "
Potassium	mg/L	" "	" "
Sodium	mg/L	" "	" "
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L	" "	" "

¹ Leachate seeps shall be sampled and analyzed for the Field and Monitoring Parameters in this table upon detection. The quantity of leachate shall be estimated and reported in gallons/day. Also, refer to Section B.4

TABLE IV
SURFACE WATER DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Sampling Frequency</u> ¹	<u>Reporting Frequency</u>
Field Parameters			
Temperature	°C	Semiannual	Semiannual
Electrical Conductivity	umhos/cm	Semiannual	Semiannual
pH	pH units	Semiannual	Semiannual
Turbidity	Turbidity units	Semiannual	Semiannual
Flow to Waters of U.S.	Yes or No	Semiannual	Semiannual
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L	Semiannual	Semiannual
Carbonate	mg/L	Semiannual	Semiannual
Bicarbonate	mg/L	Semiannual	Semiannual
Chloride	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual	Semiannual
Sulfate	mg/L	Semiannual	Semiannual
Calcium	mg/L	Semiannual	Semiannual
Magnesium	mg/L	Semiannual	Semiannual
Potassium	mg/L	Semiannual	Semiannual
Sodium	mg/L	Semiannual	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L	Semiannual	Semiannual
5-Year Constituents of Concern (see Table VI)			
Total Organic Carbon	mg/L	5 years	1 st Quarter 2017
Inorganics (dissolved)	ug/L	5 years	and every 5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	5 years	thereafter
Semi-Volatile Organic Compounds (USEPA Method 8270D)	ug/L	5 years	" "
Chlorophenoxy Herbicides (USEPA Method 8151A)	ug/L	5 years	" "
Organophosphorus Compounds (USEPA Method 8141B)	ug/L	5 years	" "

¹ Semiannual surface water monitoring is required twice per year when there is water present at the designated surface water monitoring point any time during the reporting period (1 January to 30 June or 1 July to 31 December). Reporting shall include whether there was flow from the facility to waters of the U.S. when the samples were collected.

TABLE V

MONITORING PARAMETERS FOR DETECTION MONITORING

Surrogates for Metallic Constituents:

pH
Total Dissolved Solids
Electrical Conductivity
Chloride
Sulfate
Nitrate nitrogen

Volatile Organic Compounds, short list:

USEPA Method 8260B

Acetone
Acrylonitrile
Benzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC-12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)
cis-1,2-Dichloroethylene (cis-1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Di-isopropylether (DIPE)
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
2-Hexanone (Methyl butyl ketone)
Hexachlorobutadiene
Hexachloroethane
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)

TABLE V

MONITORING PARAMETERS FOR DETECTION MONITORING

Continued

Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl ethyl ketone (MEK: 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
4-Methyl-2-pentanone (Methyl isobutylketone)
Naphthalene
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride
Xylenes

TABLE VI
5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

<u>Inorganics (dissolved):</u>	<u>USEPA Method</u>
Aluminum	6010
Antimony	7041
Barium	6010
Beryllium	6010
Cadmium	7131A
Chromium, Hexavalent	7199
Chromium	6010
Cobalt	6010
Copper	6010
Silver	6010
Tin	6010
Vanadium	6010
Zinc	6010
Iron	6010
Manganese	6010
Arsenic	7062
Lead	7421
Mercury	7470A
Nickel	7521
Selenium	7742
Thallium	7841
Cyanide	9010C
Sulfide	9030B

Volatile Organic Compounds, extended list:

USEPA Method 8260B

Acetone
Acetonitrile (Methyl cyanide)
Acrolein
Acrylonitrile
Allyl chloride (3-Chloropropene)
Benzene
Bromochloromethane (Chlorobromomethane)
Bromodichloromethane (Dibromochloromethane)
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- 1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC 12)
1,1 -Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1, 1-Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans- 1,2-Dichloroethylene (trans- 1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane (Trimethylene dichloride)
2,2-Dichloropropane (Isopropylidene chloride)
1,1 -Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
2-Hexanone (Methyl butyl ketone)
Isobutyl alcohol
Methacrylonitrile
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
Methyl methacrylate
4-Methyl-2-pentanone (Methyl isobutyl ketone)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Naphthalene
Propionitrile (Ethyl cyanide)
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)
Toluene
1,2,4-Trichlorobenzene

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

1,1,1 -Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene; TCE)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride (Chloroethene)
Xylene (total)

Semi-Volatile Organic Compounds:

USEPA Method 8270D - base, neutral, & acid extractables

Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
Aldrin
4-Aminobiphenyl
Anthracene
Benzo[a]anthracene (Benzanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
Bis(2-ethylhexyl) phthalate
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC (Lindane)
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methylethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)
4-Bromophenyl phenyl ether
Butyl benzyl phthalate (Benzyl butyl phthalate)
Chlordane
p-Chloroaniline
Chlorobenzilate
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene
o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Dieldrin
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-Dimethylphenol (m-Xylenol)
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
Diphenylamine
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethyl methanesulfonate
Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorocyclopentadiene
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isodrin
Isophorone
Isosafrole
Kepone
Methapyrilene
Methoxychlor
3-Methylcholanthrene
Methyl methanesulfonate

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

2-Methylnaphthalene
1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine
o-Nitroaniline (2-Nitroaniline)
m-Nitroaniline (3-Nitroaniline)
p-Nitroaniline (4-Nitroaniline)
Nitrobenzene
o-Nitrophenol (2-Nitrophenol)
p-Nitrophenol (4-Nitrophenol)
N-Nitrosodi-n-butylamine (Di-n-butylnitrosamine)
N-Nitrosodiethylamine (Diethylnitrosamine)
N-Nitrosodimethylamine (Dimethylnitrosamine)
N-Nitrosodiphenylamine (Diphenylnitrosamine)
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine)
N-Nitrosomethylethylamine (Methylethylnitrosamine)
N-Nitrosopiperidine
N-Nitrosopyrrolidine
5-Nitro-o-toluidine
Pentachlorobenzene
Pentachloronitrobenzene (PCNB)
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Polychlorinated biphenyls (PCBs; Aroclors)
Pronamide
Pyrene
Safrole
1,2,4,5-Tetrachlorobenzene
2,3,4,6-Tetrachlorophenol
o-Toluidine
Toxaphene
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

Chlorophenoxy Herbicides:

USEPA Method 8151A

2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Organophosphorus Compounds:

USEPA Method 8141B

Atrazine
Chlorpyrifos
0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)
Diazinon
Dimethoate
Disulfoton
Ethion
Methyl parathion (Parathion methyl)
Parathion
Phorate
Simazine

INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS ORDER R5-2013-0031 TUOLUMNE COUNTY COMMUNITY RESOURCES AGENCY BIG OAK FLAT (GROVELAND) SANITARY LANDFILL COUNTY OF TUOLUMNE

Background

The Tuolumne County Community Resources Agency (hereafter Discharger) owns and operates the closed Class III Big Oak Flat (Groveland) Sanitary Landfill (Facility) located approximately two miles south of the unincorporated town of Groveland at the end of Merrell Road, in Section 33, T1S, R16E, MDB&M.

The closed Facility is on a 10-acre property that the County of Tuolumne (County) initially leased from the United States Department of the Interior Bureau of Land Management (BLM). The Facility consists of one unlined waste management unit (Unit) covering five acres. The existing landfill Unit began operating in 1965. The Facility operated as a burn dump from 1967 to 1975 and then the Facility was operated as a "canyon fill" landfill. By the end of 2000, the total waste volume was estimated to be 124,863 cubic yards. The Facility ceased accepting waste in May 2001. As corrective action to VOCs found in groundwater, the landfill was capped and closed in accordance with a Final Closure and Post-Closure Maintenance Plan. The County completed installation of the closure cap and cover in late 2002. The County acquired the property from BLM on 14 October 2004.

In August 2005, without prior concurrence from the Central Valley Water Board and revision of the Monitoring and Reporting Program No. R5-2002-0142 the Discharger rehabilitated downgradient groundwater monitoring wells GMW-2 and GMW-3. In the process of rehabilitating the wells the Discharger changed the well configuration e.g. well screen locations, pump depth location, and pump type (high flow to low flow). Following the rehabilitation of GMW-2 and GMW-3 the Discharger in its quarterly monitoring reports reported significant improvement in groundwater quality as many VOCs previously detected in trace values were now undetectable. Furthermore, VOCs reported above the PQL were now only detected intermittently as trace values.

Due to unauthorized changes to the Groundwater Monitoring System the Discharger's detection monitoring program for groundwater monitoring at the landfill does not meet the requirements contained in Title 27 Section 20415(b)(B)(3 thru 5).

Summary of Revisions

On 1 July 2012, the Discharger submitted an amended Report of Waste Discharge (ROWD) for the landfill. The information in the amended ROWD has been used in revising these waste discharge requirements (WDRs). The ROWD contains the applicable information required in Title 27. The ROWD and supporting documents contain information related to this revision of the WDRs including:

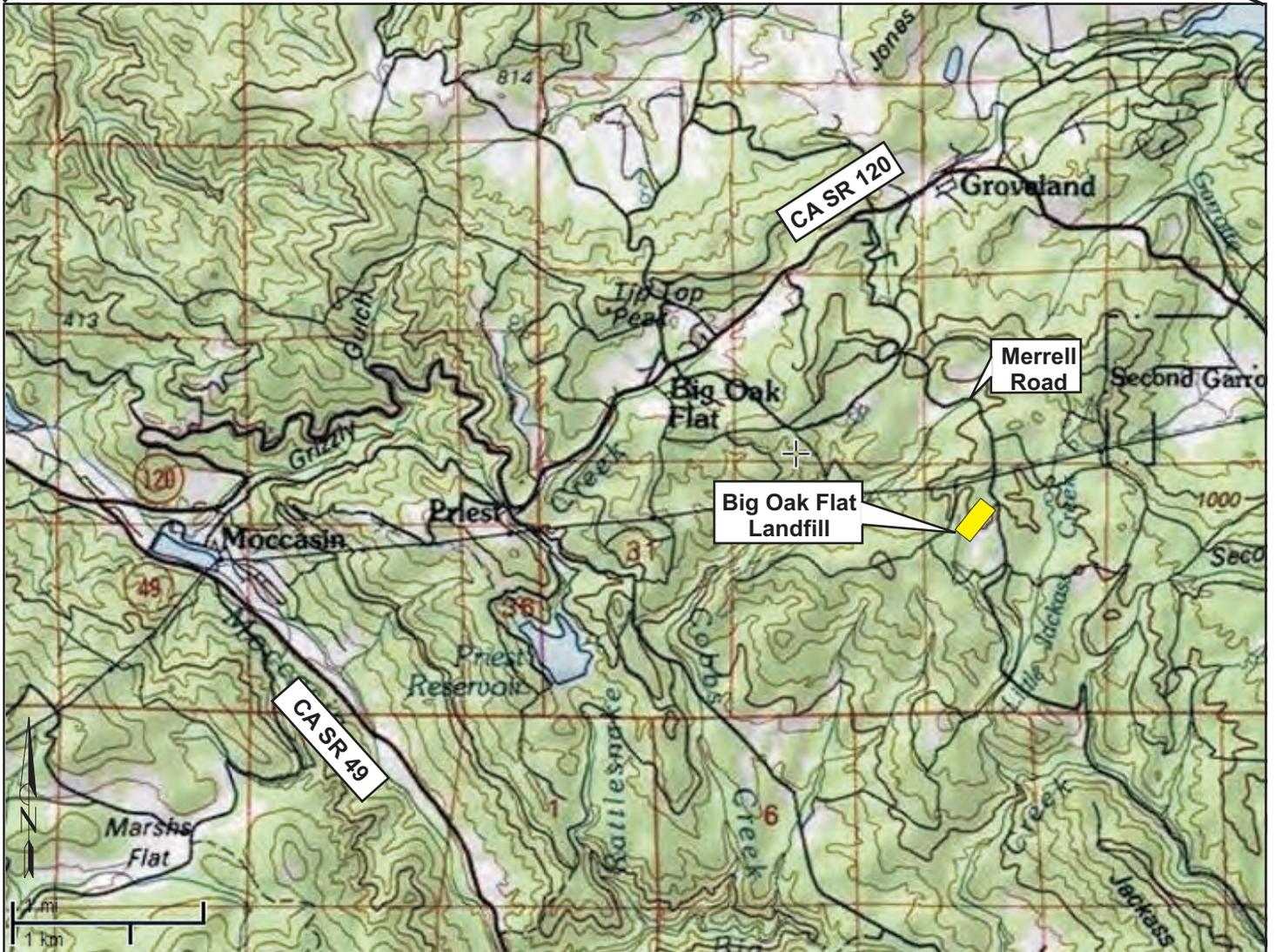
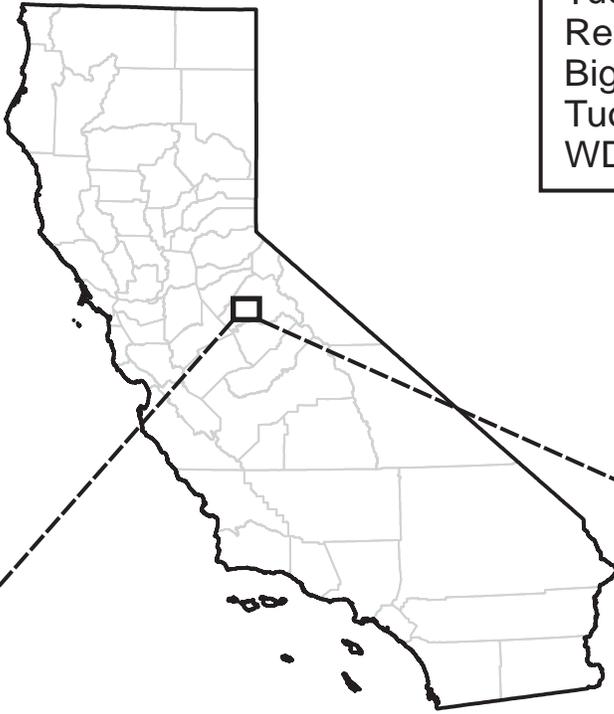
- a. Information describing unauthorized changes made by the Discharger to the groundwater monitoring network in 2005 (See Findings 40 thru 45) whereby the Central

Valley Water Board finds the Facility's Detection Monitoring Program (DMP) to be non-compliant with Title 27, CCR, §20415 (b)(1)(B)(3 thru 5) requirements, and

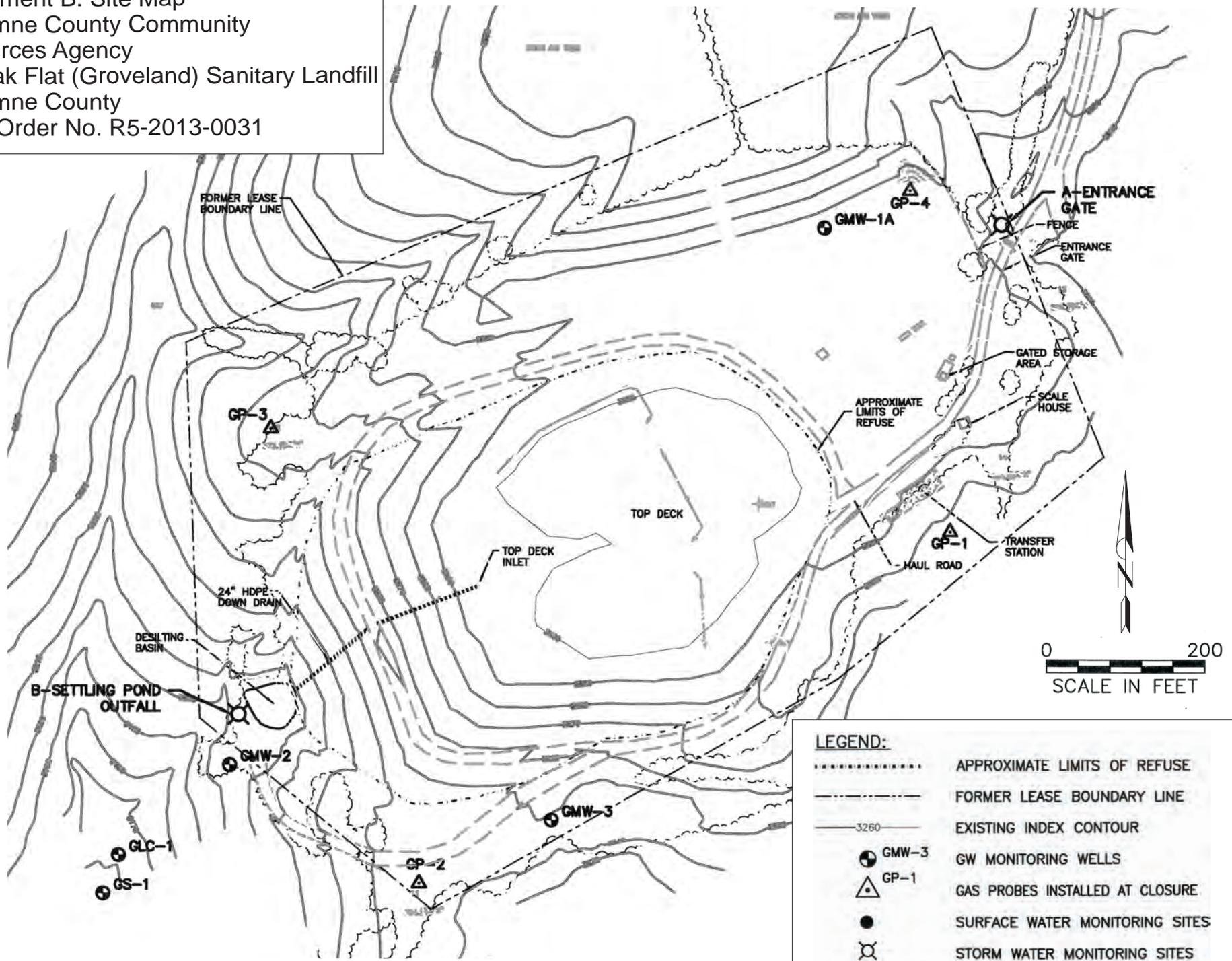
- b. Recommendations by the Discharger to reevaluate the groundwater monitoring network to bring the DMP back into compliance with Title 27 requirements, and
- c. A time schedule describing tasks that the Discharger must perform to evaluate the Water Quality Protection Standard and the Groundwater Monitoring System at the Facility in order to ensure the Facility complies with Title 27 requirements for class III landfills.

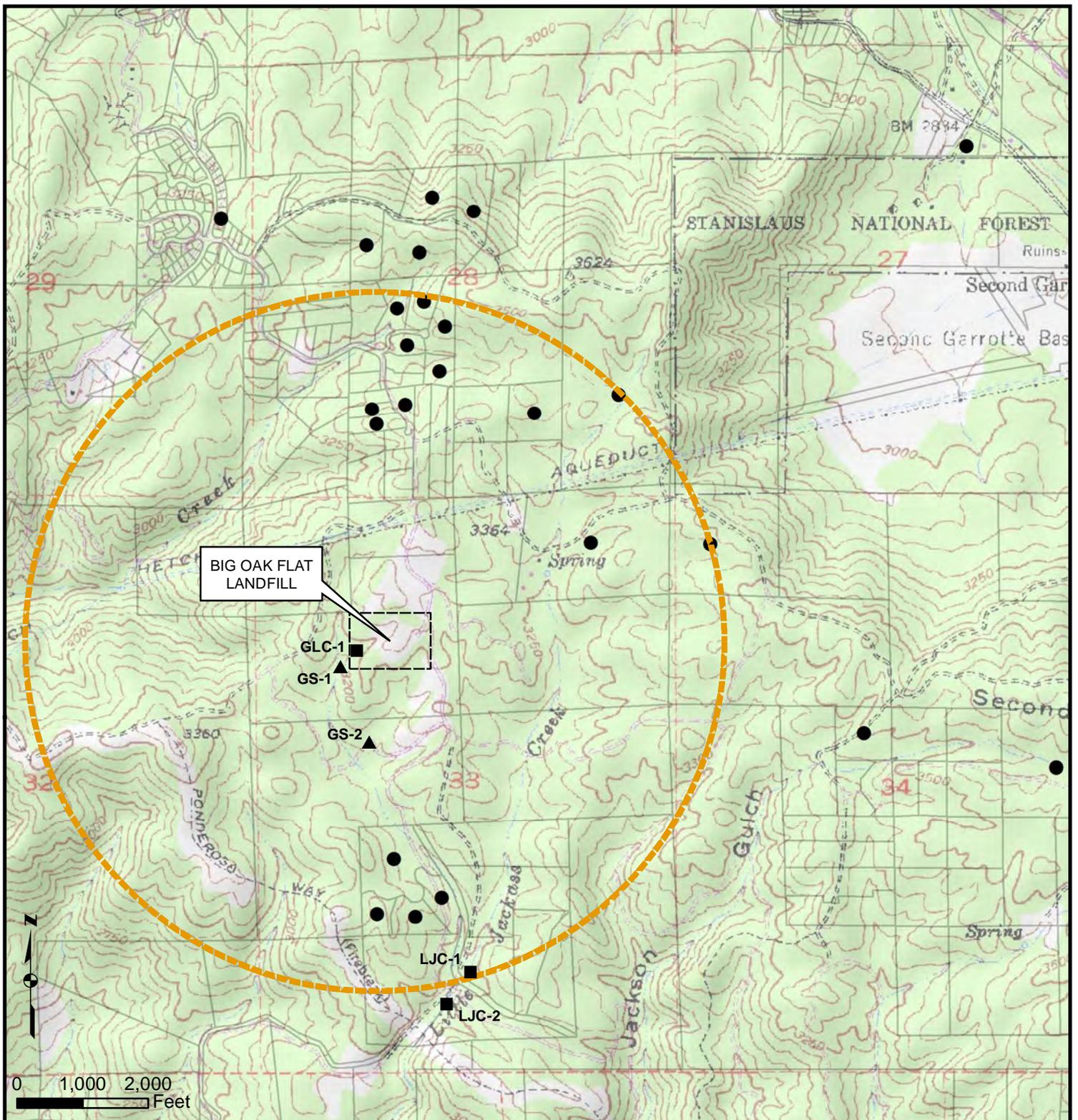
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Attachment A: Location Map
Tuolumne County Community
Resources Agency
Big Oak Flat (Groveland) Sanitary Landfill
Tuolumne County
WDR Order No. R5-2013-0031



Attachment B: Site Map
 Tuolumne County Community
 Resources Agency
 Big Oak Flat (Groveland) Sanitary Landfill
 Tuolumne County
 WDR Order No. R5-2013-0031





Legend

- Domestic/Public Supply Well
- Surface Water Monitoring
- ▲ Spring Location
- 1 Mile Radius

Attachment C:
 Domestic/Public Supply Wells
 and Surface Water Monitoring
 Tuolumne County Community
 Resources Agency
 Big Oak Flat (Groveland) Sanitary Landfill
 WDR Order No. R5-2013-0031

ATTACHMENT D

REQUIREMENTS FOR MONITORING WELL INSTALLATION WORKPLANS AND MONITORING WELL INSTALLATION REPORTS

Prior to installation of any groundwater monitoring wells, the Discharger shall submit a workplan containing, at a minimum, the information listed in Section 1 below. Wells may be installed after Water Board staff approves the workplan. Upon installation of the monitoring wells, the Discharger shall submit a well installation report that includes the information contained in Section 2 below. All workplans and reports must be prepared under the direction of, and signed by, a registered geologist or civil engineer licensed by the State of California.

SECTION 1 -Monitoring Well Installation Workplan and Groundwater Sampling and Analysis Plan

The monitoring well installation workplan shall contain the following minimum information:

A. General Information

1. Purpose of the well installation project,
2. Brief description of local geologic and hydrogeologic conditions,
3. Proposed monitoring well locations and rationale for well locations,
4. Topographic map showing facility location, roads, and surface water bodies,
5. Large scaled site map showing all existing on-site wells, proposed wells, surface drainage courses, surface water bodies, buildings, waste handling facilities, utilities, and major physical and man-made features.

B. Drilling Details

1. On-site supervision of drilling and well installation activities,
2. Description of drilling equipment and techniques,
3. Equipment decontamination procedures,
4. Soil sampling intervals (if appropriate),
5. Logging methods, which shall comply with ASTM D2488-93 *Method for Visual Classification, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) for field work.*

C. Monitoring Well Design – Diagram and Narrative

1. Proposed well construction details:
 - a. Borehole diameter,
 - b. Casing and screen material, diameter, and centralizer spacing (if needed),
 - c. Type of well caps (bottom cap either screw on or secured with stainless steel screws),
 - d. Anticipated depth of well, length of well casing, depth and thickness of saturated zones, and length and position of perforated interval,
 - e. Thickness, position and composition of surface seal, sanitary seal, and sand pack,
 - f. Anticipated screen slot size and filter pack.

D. Well Development (at least 48 hours after sanitary seal placement)

1. Method of development to be used (i.e., surge, bail, pump, etc.),

2. Parameters to be monitored during development and record keeping technique,
3. Method of determining when development is complete,
4. Disposal of development water.

E. Well Survey - Horizontal and Vertical Coordinates

1. Name of the Licensed Land Surveyor or Civil Engineer,
2. Datum for survey measurements,
3. List of well features to be surveyed: top of casing, horizontal and vertical coordinates, etc.,
4. Accuracy: Horizontal within 0.1 foot and Vertical within 0.01-foot.

F. Water Level Measurement

1. The elevation reference point at each monitoring well must be within 0.01-foot,
2. Ground surface elevation at each monitoring well must be within 0.01-foot,
3. Method and time of water level measurement must be specified.

G. Sampling and Laboratory Analysis

Groundwater sampling, field tests, and laboratory analysis must comply with the requirements in the Waste Discharge Requirements, Monitoring and Reporting Program, and Standard Provisions. All Method Detection Limits, Practical Quantitation limits, and "trace" concentrations must be reported on the laboratory reports, as required in the WDRs.

H. Proposed Schedule for Completion of Work

SECTION 2 - Monitoring Well Installation Report

The monitoring well installation report must provide the information listed below. In addition, the report must also clearly identify, describe, and justify any deviations from the approved workplan.

A. General Information:

1. Purpose of the well installation project,
2. Brief description of local geologic and hydrogeologic conditions encountered during installation of the wells,
3. Number of monitoring wells installed and copies of County Well Construction Permits,
4. Topographic map showing facility location, roads, surface water bodies,
5. Scaled site map showing all previously existing wells, newly installed wells, surface water bodies, buildings, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details – Narrative and Graphic

1. On-site supervision of drilling and well installation activities,
2. Drilling contractor and driller's name,
3. Description of drilling equipment and techniques,
4. Equipment decontamination procedures,
5. Soil sampling intervals and logging methods,
6. Well boring log:

- a. Well boring number and date drilled
- b. Borehole diameter and total depth
- c. Total depth of open hole (same as total depth drilled if no caving or back-grouting occurs)
- d. Depth and thickness of saturated zones,
- e. Depth to first encountered groundwater and stabilized groundwater depth,
- f. Detailed description of soils encountered, using ASTM D2488-93 *Method for Visual Classification, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) for Field Work*.

C. Well Construction Details – Diagram and Narrative

1. Well construction details
 - a. Well number, date started, date completed, geologist's name
 - b. Total depth drilled
 - c. Drilling Contractor and driller name and address
 - d. Depth of open hole (same as total depth drilled if no caving occurs)
 - e. Method and materials of grouting excess borehole
 - f. Footage of hole collapsed
 - g. Length of slotted casing installed
 - h. Depth of bottom of casing
 - i. Depth to top of sand pack
 - j. Thickness of sand pack
 - k. Depth to top of bentonite seal
 - l. Thickness of bentonite seal
 - m. Thickness of concrete grout
 - n. Boring diameter
 - o. Casing diameter
 - p. Casing material
 - q. Size of perforations
 - r. Well elevation at top of casing
 - s. Initial and stabilized depth to groundwater
 - t. Date of water level measurement
 - u. Monitoring well number
 - v. Date drilled

E. Well Development

1. Date(s) and method of development of each well,
2. Method of development,
3. How well development completion was determined,
4. Volume of water purged from well and method of development water disposal,
5. Field notes from well development.

F. Well Survey Results

1. Description of the measuring points (i.e. ground surface, top of casing, etc.),
2. Coordinate system, epochs, bench marks, horizontal controls, accuracy, and precision,
3. Vertical survey results with casing elevation with the cap removed within ± 0.01 foot accuracy,
4. Horizontal survey results with coordinates within ± 0.1 foot accuracy,

5. California Registered Civil Engineer or Licensed Surveyor's report, field notes, and stamp/signature in an appendix,
6. Tabulated installation data with well number(s), date well installed, datum, horizontal coordinates, vertical coordinates, ground surface elevation, total depth drilled, elevation of top of screen, elevation of bottom of screen, completed well depth, and depth of pump inlet.

G. Laboratory Analytical Results

All analytical reports prepared for the Discharger's facility must contain, at a minimum, the information within this section.

1. Tabulated field and analytical data with sample location identification numbers, water quality goals, field/analytical results, and highlighted data that is outside water quality goals,
2. Appendix with laboratory reports, COCs, and laboratory signatures on reports,
3. Laboratory reports showing results, reporting units, MDLs, PQLs, "trace" results, flagged results, matrix effects, and QA/QC results,
4. Site map(s) showing iso-concentration lines for Constituents of Concern,
5. Piper Diagrams and Stiff Plots comparing upgradient and downgradient water quality parameters,
6. Discussion of results including, but not limited to, discussion of violations, exceedances, if all field and monitoring parameters were sampled and analyzed, description of groundwater flow direction, comparison of analysis and field sampling results to background and water quality goals, list of potential constituents of concern at each sampling location, and other relevant discussions,
7. Certification statement signed by an authorized representative,
8. Report signed and stamped by California Licensed engineer or geologist.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
FOR
WASTE DISCHARGE REQUIREMENTS
FOR
NONHAZARDOUS SOLID WASTE DISCHARGES
REGULATED BY SUBTITLE D AND/OR TITLE 27
(40 C.F.R. section 258 and Title 27, § 20005 et seq.)

JANUARY 2012

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A. APPLICABILITY

1. These Standard Provisions and Reporting Requirements (SPRRs) are applicable to nonhazardous solid waste disposal sites that are regulated by the Central Valley Regional Water Quality Control Board (hereafter, Central Valley Water Board) pursuant to the provisions of California Code of Regulations, title 27 ("Title 27"), section 20005 et seq., and municipal solid waste (MSW) landfills that are subject to the Federal Subtitle D regulations contained in 40 Code of Federal Regulations section 258 (hereafter, "Subtitle D" or "40 C.F.R. § 258.XX") in accordance with State Water Resources Control Board (State Water Board) Resolution 93-62. The Subtitle D regulations are only applicable to MSW landfills and therefore any requirements in these SPRRs that are referenced as coming from Subtitle D are not applicable to non-MSW waste management units such as Class II surface impoundments, Class II waste piles, and non-MSW landfill units. All Subtitle D requirements in these SPRRs are referenced with "[40 C.F.R. § 258.XX]" after the requirement.
2. "Order," as used throughout this document, means the Waste Discharge Requirements (WDRs) to which these SPRRs are incorporated.
3. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, and do not protect the Discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.
4. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.
5. If there is any conflicting or contradictory language between the WDRs, the Monitoring and Reporting Program (MRP), or the SPRRs, then language in the WDRs shall govern over either the MRP or the SPRRs, and language in the MRP shall govern over the SPRRs.
6. If there is a site-specific need to change a requirement in these SPRRs for a particular landfill facility, the altered requirement shall be placed in the appropriate section of the WDRs and will supersede the corresponding SPRRs requirement. These SPRRs are standard and cannot be changed as part of the permit writing process or in response to comments, but they will be periodically updated on an as-needed basis.
7. Unless otherwise stated, all terms are as defined in Water Code section 13050 and in Title 27, section 20164.

B. TERMS AND CONDITIONS

1. Failure to comply with any waste discharge requirement, monitoring and reporting requirement, or Standard Provisions and Reporting Requirement, or

other order or prohibition issued, reissued, or amended by the Central Valley Water Board or the State Water Board, or intentionally or negligently discharging waste, or causing or permitting waste to be deposited where it is discharged into the waters of the state and creates a condition of pollution or nuisance, is a violation of this Order and the Water Code, which can result in the imposition of civil monetary liability [Wat. Code, § 13350(a)]

2. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to [Wat. Code, § 13381]:
 - a. Violation of any term or condition contained in this Order;
 - b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;
 - c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge; or
 - d. A material change in the character, location, or volume of discharge.
3. Before initiating a new discharge or making a material change in the character, location, or volume of an existing discharge, the Discharger shall file a new report of waste discharge (ROWD), or other appropriate joint technical document (JTD), with the Central Valley Water Board [Wat. Code, § 13260(c) and § 13264(a)]. A material change includes, but is not limited to, the following:
 - a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements;
 - b. A significant change in disposal method, location, or volume (e.g., change from land disposal to land treatment);
 - c. A change in the type of waste being accepted for disposal; or
 - d. A change to previously-approved liner systems or final cover systems that would eliminate components or reduce the engineering properties of components.
4. Representatives of the Central Valley Water Board may inspect the facilities to ascertain compliance with the waste discharge requirements. The inspection shall be made with the consent of the owner or possessor of the facilities or, if the consent is refused, with a duly issued warrant. However, in the event of an emergency affecting the public health or safety, an inspection may be made without consent or the issuance of a warrant [Wat. Code, §13267(c)].

5. The Central Valley Water Board will review this Order periodically and will revise these waste discharge requirements when necessary [Wat. Code, § 13263(e) and Title 27, § 21720(b)].
6. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Central Valley Water Board [Wat. Code, § 13267(b)]. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.
7. A discharge of waste into the waters of the state is a privilege, not a right. No discharge of waste into waters of the state, whether or not the discharge is made pursuant to waste discharge requirements, shall create a vested right to continue the discharge [Wat. Code, § 13263(g)].
8. Technical and monitoring reports specified in this Order are requested pursuant to the Water Code [§13267(b)]. Failure to furnish the reports by the specified deadlines or falsifying information in the reports, are misdemeanors that may be liable civilly in accordance with §13268(b) of the Water Code [Wat. Code, §13268(a)].

C. STANDARD PROHIBITIONS

1. The discharge of liquid or semi-solid waste (waste containing less than 50 percent solids) is prohibited, except for the following when proposed in the ROWD/JTD and approved by this Order:
 - a. Dewatered sewage or water treatment sludge as described in Title 27, section 20220(c) provided it is discharged above a composite liner with a leachate collection and removal system (LCRS) [Title 27, § 20200(d)(3)].
 - b. Leachate and/or landfill gas condensate that is returned to the composite-lined waste management unit (with an LCRS) from which it came [Title 27, § 20340(g) and 40 C.F.R. § 258.28].
2. The discharge of wastes which have the potential to reduce or impair the integrity of containment structures or which, if commingled with other wastes in the waste management unit, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products, which, in turn:
 - a. require a higher level of containment than provided by the unit; or
 - b. are 'restricted wastes'; or
 - c. impair the integrity of containment structures;is prohibited [Title 27, § 20200(b)].

3. The discharge of wastes outside of a waste management unit or portions of a unit specifically designed for their containment is prohibited.
4. The discharge of solid waste containing free liquid or which may contain liquid in excess of the moisture holding capacity as a result of waste management operations, compaction or settlement is prohibited.
5. The discharge of waste to a closed landfill unit is prohibited.
6. The discharge of waste constituents to the unsaturated zone or to groundwater is prohibited.
7. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.

D. STANDARD DISCHARGE SPECIFICATIONS

1. The Discharger is responsible for accurate characterization of wastes, including a determination of whether or not wastes will be compatible with containment features and other wastes at the waste management unit and whether or not the wastes are required to be managed as a hazardous waste [Title 27, § 20200(c)] or designated waste [Title 27, § 20210].
2. Leachate and landfill gas condensate collected from a waste management unit shall be discharged to the unit from which it came, or discharged to an appropriate waste management unit in accordance with Title 27 and in a manner consistent with the waste classification of the liquid [Title 27, § 20200(d) and § 20340(g)].
3. The discharge of leachate or landfill gas condensate is restricted to those portions of a waste management unit that has a composite liner system and LCRS meeting the Federal Subtitle D requirements [40 C.F.R. § 258.28].
4. Leachate and condensate returned to a composite-lined landfill unit (when approved by this Order) shall be discharged and managed such that it does not cause instability of the waste, does not cause leachate seeps, does not generate additional landfill gas that is not extracted from the landfill by an active landfill gas extraction system, does not cause contaminants to enter surface water runoff, and does not cause leachate volumes to exceed the maximum capacity of the LCRS.
5. Any discharge of waste outside the portion of the landfill that was already covered with waste as of the landfill unit's respective Federal Deadline constitutes a "lateral expansion" and requires the installation of an approved composite liner system and LCRS [40 C.F.R. § 258.40(b)].

6. Wastes shall be discharged only into waste management units specifically designed for their containment and/or treatment, as described in this Order.
7. The discharge shall remain within the designated disposal area at all times.
8. The discharge of waste shall not cause a nuisance condition [Wat. Code, § 13050(m)].

E. STANDARD FACILITY SPECIFICATIONS

1. All waste management units shall be designed, constructed, and operated to ensure that wastes, including leachate, will be a minimum of 5 feet above the highest anticipated elevation of underlying groundwater [Title 27, § 20240(c)], including the capillary fringe.
2. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].
3. Interim cover is daily and intermediate cover [Title 27, § 20750(a)]. Interim cover over wastes discharged to a landfill shall be designed and constructed to minimize percolation of liquids through the wastes [Title 27, § 20705(b)].
4. Intermediate cover consisting of compacted earthen material of at least twelve (12) inches shall be placed on all surfaces of the fill where no additional solid waste will be deposited within **180 days** [Title 27, § 20700(a)].
5. During wet weather conditions, the facility shall be operated and graded to minimize leachate generation.
6. The Discharger shall **immediately** notify the Central Valley Water Board staff of any slope failure occurring at a waste management unit. Any failure which threatens the integrity of containment features or the waste management unit shall be promptly corrected in accordance with an approved method [Title 27, § 21710(c)(2)].
7. The Discharger shall **immediately** notify Central Valley Water Board staff of any flooding, unpermitted discharge of waste off-site or outside of waste management units, equipment failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
8. The Discharger shall limit water used for facility maintenance within landfill areas to the minimum amount necessary for dust control and construction.
9. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

10. The Discharger shall lock all groundwater monitoring wells with a lock on the well cap or monitoring well box. All monitoring devices shall be clearly labeled with their designation including all monitoring wells, LCRS risers, and lysimeter risers and shall be easily accessible for required monitoring by authorized personnel. Each monitoring device shall be clearly visible and be protected from damage by equipment or vehicles.
11. The Discharger shall ensure that methane and other landfill gases are adequately vented, removed from landfill units, or otherwise controlled to prevent the danger of adverse health effects, nuisance conditions, degradation, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.
12. The Discharger shall maintain the depth of the fluid in the sump of each landfill unit at the minimum needed for efficient pump operation (the depth at which the pump turns on given the pump intake height and maximum pump cycle frequency).
13. The depth of fluid on the landfill liner shall not exceed **30 centimeters** (cm) [40 C.F.R. § 258.40(a)(2)]. This regulation is interpreted by the Central Valley Water Board to exclude the leachate sump. The Discharger shall **immediately** notify the Central Valley Water Board staff by telephone, and follow up in writing within **seven** days if monitoring reveals that the depth of fluid on any portion of the liner (excluding the sump) exceeds 30 cm (approximately 12 inches). The written notification shall include a timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.
14. Each LCRS 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 [Title 27, § 20340(d)].
15. The Discharger shall maintain a *Storm Water Pollution Prevention Plan and Monitoring Program and Reporting Requirements* in accordance with State Water Board Order No. 97-03-DWQ (or most recent general industrial storm water permit), or retain all storm water on-site.
16. Internal site drainage from surface or subsurface sources shall not contact or percolate through wastes.
17. New MSW landfill units or lateral expansions of existing units shall not be sited in a "wetland" [as defined in 40 C.F.R. § 232.29(r)] unless there is no practical alternative; steps have been taken to assure no net loss of wetland; the landfill unit will not degrade the wetland; the unit will not jeopardize threatened or endangered species or produce adverse modification of a critical habitat or violate any requirement of the Marine Protection, Research, and Sanctuaries Act of 1972 [40 C.F.R. § 258.12].

F. STANDARD CONSTRUCTION SPECIFICATIONS

1. The Discharger shall submit for review and approval at least **90 days** prior to proposed construction, design plans and specifications for new landfill modules that include the following:
 - a. Detailed construction drawings showing all required liner system components, the LCRS, leachate sump, unsaturated zone monitoring system, any proposed landfill gas monitoring and extraction points, and access to the LCRS for required annual testing.
 - b. A Construction Quality Assurance (CQA) Plan prepared by a California-registered civil engineer or certified engineering geologist, and that meets the requirements of Title 27, section 20324.
 - c. A geotechnical evaluation of the area soils, evaluating their use as the base layer or reference to the location of this information in the ROWD/JTD [Title 27, § 21750(f)(4)].
 - d. Information about the seismic design of the proposed new module (or reference to the location of this information in the ROWD/JTD) in accordance with Title 27, section 20370.
 - e. A revised water quality monitoring plan for groundwater detection monitoring (or information showing the existing plan is adequate) in accordance with Title 27, section 20415.
 - f. An Operation Plan (or reference to the location of this information in the ROWD/JTD) meeting the requirements of Title 27, section 21760(b).
2. All containment structures shall be designed by, and construction shall be supervised by, a California registered civil engineer or a certified engineering geologist, and shall be certified by that individual as meeting the prescriptive standards, or approved engineered alternative design, in accordance with this Order prior to waste discharge.
3. The Discharger shall not proceed with construction until the construction plans, specifications, and all applicable construction quality assurance plans have been approved. Waste management units shall receive a final inspection and approval of the construction by Central Valley Water Board staff before use of the unit commences [Title 27, § 20310(e)].
4. Any report, or any amendment or revision of a report, that proposes a design or design change that might affect a waste management unit's containment features or monitoring systems shall be approved by a California registered civil engineer or a certified engineering geologist [Title 27, § 21710(d)].

5. 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, physical contact with waste or leachate, chemical reactions with soil or rock, climatic conditions, the stress of installation, or because of the stress of daily operations [Title 27, § 20320(a)].
6. Waste management units and their respective containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping [Title 27, § 20365(a)].
7. The Discharger shall design storm water conveyance systems for Class III units for a 100-year, 24-hour storm event, and shall design storm water conveyance systems for Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].
8. All Class III landfill units shall be designed to withstand the maximum probable earthquake and Class II waste management units shall be designed to withstand maximum credible earthquake without damage to the foundation or to the structures that control leachate, or surface drainage, or erosion, or gas [Title 27, § 20370(a)].
9. The Discharger shall perform stability analyses that include components to demonstrate the integrity of the landfill foundation, final slopes, and containment systems under both static and dynamic conditions throughout the landfill's life including the closure period and post-closure maintenance period [Title 27, § 21750(f)(5)].
10. New waste management units and expansions of existing units shall not be located on a known Holocene fault [Title 27, § 20260(d)].
11. Liners shall be designed and constructed to contain the fluid, including landfill gas, waste, and leachate [Title 27, § 20330(a)].
12. Hydraulic conductivities 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. It is acceptable for the Discharger to use appropriate compaction tests in conjunction with laboratory hydraulic conductivity tests to determine field permeabilities as long as a reasonable number of field hydraulic conductivity tests are also conducted [Title 27, § 20320(c)].
13. Hydraulic conductivities specified for containment structures other than the final cover shall be relative to the fluids (leachate) to be contained. Hydraulic conductivities for the final cover shall be relative to water [Title 27, § 20320(b)].

14. A test pad for each barrier layer and final cover shall be constructed in a manner duplicating the field construction. Test pad construction methods, with the designated equipment, shall be used to determine if the specified density/moisture-content/hydraulic conductivity relationships determined in the laboratory can be achieved in the field with the compaction equipment to be used and at the specified lift thickness [Title 27, § 20324(g)(1)(A)].
15. Performance requirements for geosynthetic membranes shall include, but are not limited to, a need to limit infiltration of water, to the greatest extent possible; a need to control landfill gas emissions; mechanical compatibility with stresses caused by equipment traffic, and for final covers the result of differential settlement over time and durability throughout the post-closure maintenance period [Title 27, § 20324(i)(1)].
16. The Discharger shall ensure proper preparation of the subgrade for any liner system that includes a GCL so as to provide a smooth surface that is free from rocks, sticks, or other debris that could damage or otherwise limit the performance of the GCL.
17. The Discharger shall propose an electronic leak location survey of the top liner for any new landfill module in the construction quality assurance plan unless the Discharger demonstrates that a leak location survey is not needed.
18. Leachate collection and removal systems are required for Class II landfills and surface impoundments, MSW landfills, and for Class III landfills which have a liner or which accept sewage or water treatment sludge [Title 27, § 20340(a)].
19. All new landfill units or lateral expansions of existing units that require a LCRS shall have a blanket-type LCRS that covers the bottom of the unit and extends as far up the sides as possible. The LCRS 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 unit [Title 27, § 20340(e)].
20. The LCRS shall be designed, constructed, maintained, and operated to collect and remove twice the maximum anticipated daily volume of leachate from the waste management unit [Title 27, § 20340(b)].
21. Leachate collection and removal systems shall be designed and operated to function without clogging through the scheduled closure of the landfill unit and during the post-closure maintenance period.
22. The LCRS shall be designed to maintain the depth of fluid over any portion of the LCRS of no greater than 30 cm [40 C.F.R. § 258.40(a)(2)], excluding the leachate sump. The leachate sump, leachate removal pump, and pump controls shall be designed and set to maintain a fluid depth no greater than the minimum needed for efficient pump operation [Title 27, § 20340(c)].

23. All construction of liner systems and final cover systems shall be performed in accordance with a Construction Quality Assurance Plan certified by a registered civil engineer or a certified engineering geologist [Title 27, § 20323].
24. The Construction Quality Assurance program shall be supervised by a registered civil engineer or a certified engineering geologist who shall be designated the CQA officer [Title 27, § 20324(b)(2)].
25. The Discharger shall ensure that a third party independent of both the Discharger and the construction contractor performs all of the construction quality assurance monitoring and testing during the construction of a liner system.
26. The Discharger shall notify Central Valley Water Board staff at least **14 days** prior to commencing field construction activities including construction of a new lined cell or module, construction of a final cover, or any other construction that requires Central Valley Water Board staff approval under this Order.
27. The Discharger shall submit for review and approval at least **60 days** prior to proposed discharge, final documentation required in Title 27 Section 20324(d)(1)(C) following the completion of construction of a new lined landfill module. The report shall be certified by a registered civil engineer or a certified engineering geologist and include a statement that the liner system was constructed in accordance with the approved design plans and specifications, the CQA Plan, the requirements of the WDRs, and that it meets the performance goals of Title 27. The report shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, the construction quality assurance plan, and the performance goals of Title 27.
28. The Discharger shall not discharge waste onto a newly constructed liner system until the final documentation report has been reviewed and an acceptance letter has been received.
29. Prior to placement of waste in a new landfill unit, the Discharger shall monitor any pan lysimeter for the unit that has received enough rainfall to flood the LCERS sump. If liquid is detected in the pan lysimeter, the Discharger shall verify that the liquid is not from a leak in the primary liner system before waste can be accepted to the new module.

G. STANDARD CLOSURE AND POST-CLOSURE SPECIFICATIONS

1. The Discharger shall submit a final or partial final closure and post-closure maintenance plan at least **two years** prior to the anticipated date of closure [Title 27, § 21780(d)(1)].

2. The Discharger shall notify the Central Valley Water Board in writing that a landfill unit or portion of a unit is to be closed either at the same time that the California Department of Resources Recycling and Recovery (CalRecycle) is notified or **180 days** prior to beginning any final closure activities, whichever is sooner [Title 27, § 21710(c)(5)(A)]. The notice shall include a statement that all closure activities will conform to the most recently approved final or partial final closure plan and that the plan provides for site closure in compliance with all applicable federal and state regulations [Title 27, § 21710(c)(5)(C)].
3. Initiation of closure activities shall begin within **30 days** of final waste receipt, or within **one year** of receipt of most recent waste if additional capacity remains [40 C.F.R. § 258.60(f)].
4. Closure activities shall be completed within **180 days** of the beginning of closure activities unless an extension is granted by the Executive Officer [40 C.F.R. § 258.60(g)].
5. The Discharger shall carry out both mandatory closure and normal closure of a waste management unit or a portion of a unit in accordance with a closure and post-closure maintenance plan approved by the Central Valley Water Board [Title 27, § 20950(a)(1)] through the issuance of closure waste discharge requirements.
6. The Discharger shall notify the Central Valley Water Board that a preliminary closure and post-closure maintenance plan has been prepared and placed in the operating record by the date of initial receipt of waste at any new MSW landfill unit or lateral expansion of any existing unit [40 C.F.R. § 258.60(d)]. This notification shall be included in the cover letter transmitting the preliminary closure and post-closure maintenance plan.
7. In addition to the applicable provisions of Title 27, the preliminary closure and/or the post-closure maintenance plans for MSW landfill units shall include the following:
 - a. A description of the steps necessary to close all MSW landfill units at any point during their active life in accordance with the cover design requirements [40 C.F.R. § 258.60(c)];
 - b. An estimate of the largest area of the landfill unit(s) ever requiring a final cover at any time during the active life of the unit(s) [40 C.F.R. § 258.60(c)(2)];
 - c. An estimate of the maximum inventory of wastes ever on-site over the active life of the waste management facility [40 C.F.R. § 258.60(c)(3)]; and
 - d. A schedule for completing all activities necessary to satisfy the closure criteria in 40 C.F.R. section 258.60 [40 C.F.R. § 258.60(c)(4)].

8. The final closure and post-closure maintenance plan for the waste management unit shall include at least the following: an itemized cost analysis, closure schedule, any proposed final treatment procedures, map, changes to the unit description presented in the most recent ROWD, federal requirements for a MSW facility, land use of the closed unit, and a construction quality assurance plan [Title 27, § 21769(c) & (d)].
9. Closure of each waste management unit shall be under the direct supervision of a registered civil engineer or certified engineering geologist [Title 27, § 20950(b)].
10. The final cover of closed landfills shall be designed, graded, and maintained to prevent ponding and soil erosion due to high run-off velocities [Title 27, § 21090(b)(1)(A)].
11. The final grading design shall be designed and approved by a registered civil engineer or certified engineering geologist [Title 27, § 21090(b)(1)(C)].
12. All final cover designs shall include a minimum 1-foot thick erosion resistant layer [Title 27, § 21090(a)(3)(A)].
13. The Discharger shall close the landfill with minimum 15-foot wide benches every 50 vertical feet [Title 27, § 21090(a)].
14. Final cover slopes shall not be steeper than a horizontal to vertical ratio of one and three quarters to one and designs having any slopes steeper than a horizontal to vertical ratio of three to one, or having a geosynthetic component, shall have these aspects of their design specifically supported in the slope stability report required in Title 27, section 21750(f)(5) [Title 27, § 21090(a)].
15. For any portions of the final cover installed after July 18, 1997, for which the Central Valley Water Board has not approved a slope and foundation stability report on or before that date, the Discharger shall meet the requirements of Title 27, section 21750(f)(5) [Title 27, § 21090(a)(6)].
16. Areas with slopes greater than ten percent, surface drainage courses, and areas subject to erosion by wind or water shall be designed and constructed to prevent such erosion [Title 27, § 21090(b)(2)].
17. The Discharger shall design storm water conveyance systems for closed Class III units for a 100-year, 24-hour storm event, and shall design storm water conveyance systems for closed Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].
18. Closed landfill units shall be provided with at least two permanent surveying monuments, installed by a licensed land surveyor or by a registered civil engineer, from which the location and elevation of all wastes, containment

structures, and monitoring facilities can be determined throughout the post-closure maintenance period [Title 27, § 20950(d)].

19. Following closure of any MSW landfill units, the Discharger shall notify the Executive Officer that the deed to the landfill facility property, or some other instrument that is normally examined during a title search, has been recorded and a copy placed in the operating record. The notation on the deed shall in perpetuity notify any potential purchaser of the property that the land has been used as a landfill facility and that use of the land is restricted to the planned use described in the post-closure maintenance plan [Title 27, § 20515(a)(4) and §21170, and 40 C.F.R. § 258.60(i)].
20. Construction or repair of the final cover system's low-hydraulic conductivity layer is to be carried out in accordance with an approved construction quality assurance plan [Title 27, § 21090(b)(1)(E)].
21. The Discharger shall incorporate into the closure and post-closure maintenance plan a cover-integrity monitoring and maintenance program which includes at least the following: a periodic leak search, periodic identification of other problem areas, prompt cover repair, and vegetation maintenance [Title 27, § 21090(a)(4)].
22. The Discharger shall complete a final cover survey upon completion of closure activities for that portion of the landfill. The final cover surveys shall include an initial survey and map [Title 27, § 21090(e)(1). Every **five years**, the Discharger shall conduct a survey of the closed landfill cover and submit an iso-settlement map accurately depicting the estimated total change in elevation of each portion of the final cover's low-hydraulic-conductivity layer [Title 27, § 21090(e)(2)].
23. Within **30 days** of completion of all closure activities, the Discharger shall certify that all closure activities were performed in accordance with the most recently approved final closure plan and CQA Plan, and in accordance with all applicable regulations. The Discharger shall also certify that closed landfill units shall be maintained in accordance with and approved post-closure maintenance plan [Title 27, § 21710(c)(6)].
24. Within **180 days** of completion of closure construction activities, the Discharger shall submit final documentation of closure, including the Certification of Closure. The closure documents shall include a final construction quality assurance report and any other documents necessary to support the certification [Title 27, § 21880].
25. The post-closure maintenance period shall continue until the Central Valley Water Board determines that wastes remaining in the landfill unit(s) no longer pose a threat to water quality [Title 27, § 20950(a)(1)].

26. The Discharger shall conduct a periodic leak search to monitor of the integrity of the final cover in accordance with the schedule in the approved final post-closure maintenance plan [Title 27, § 21090(a)(4)(A)].
27. The Discharger shall periodically inspect and identify problems with the final cover including areas that require replanting, erosion, areas lacking free drainage, areas damaged by equipment operations, and localized areas identified in the required five-year iso-settlement survey [Title 27, § 21090(a)(4)(B)].
28. The Discharger shall repair the cover promptly in accordance with a cover repair plan to be included in the final post-closure maintenance plan [Title 27, § 21090(a)(4)(C)].
29. Throughout the post-closure maintenance period, the Discharger shall maintain the structural integrity and effectiveness of all containment structures, maintain the final cover as necessary to correct the effects of settlement and other adverse factors, continue to operate the LCRS as long as leachate is generated and detected, maintain the monitoring systems, prevent erosion and related damage of the final cover due to drainage, and protect and maintain surveyed monuments [Title 27, § 21090(c)].
30. Post-closure maintenance shall be conducted for a minimum period of **30 years** or until the waste no longer poses a threat to environmental quality, whichever is greater [Title 27, § 21180(a) and Title 27, § 21900(a)].

H. STANDARD FINANCIAL ASSURANCE PROVISIONS

1. The Discharger shall establish an irrevocable fund for closure and post-closure maintenance to ensure closure and post-closure maintenance of each classified unit in accordance with an approved closure and post-closure maintenance plan [Title 27, § 20950(f) and § 22207(a)].
2. The Discharger shall obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known and reasonably foreseeable releases from the waste management unit [Title 27, §20380(b), § 22221, and § 22222].

I. STANDARD MONITORING SPECIFICATIONS

1. The water quality monitoring program shall include appropriate and consistent sampling and analytical procedures and methods designed to ensure that monitoring results provide a reliable indication of water quality at all monitoring points and background monitoring points [Title 27, § 20415(e)(4) and 40 C.F.R. § 258.53(b)].

2. All monitoring systems shall be designed and certified by a registered geologist or a registered civil engineer [Title 27, § 20415(e)(1)].
3. 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 [Title 27, § 20415(b)(4)(A)].
4. All sample chemical analyses of any material shall be performed by a laboratory certified by the California Department of Health Services [Wat. Code, § 13176(a)].
5. A Detection Monitoring Program for a new landfill facility shall be installed, operational, and one year of monitoring data collected from background monitoring points prior to the discharge of wastes [Title 27, § 20415(e)(6)].
6. Background for water samples or soil-pore gas samples shall be represented by the data from all samples taken from applicable background monitoring points during that reporting period (at least one sample from each background monitoring point).
7. The Discharger shall submit for approval, establish, and maintain an approved Sample Collection and Analysis Plan. The Sample Collection and Analysis Plan shall at a minimum include:
 - a. Sample collection procedures describing purging techniques, sampling equipment, and decontamination of sampling equipment;
 - b. Sample preservation information and shipment procedures;
 - c. Sample analytical methods and procedures;
 - d. Sample quality assurance/quality control (QA/QC) procedures;
 - e. Chain of Custody control; and
 - f. Sample analysis information including sample preparation techniques to avoid matrix interferences, method detection limits (MDLs), practical quantitation limits (PQLs) and reporting limits (RLs), and procedures for reporting trace results between the MDL and PQL.

If required by the Executive Officer, the Discharger shall modify the Sample Collection and Analysis Plan to conform with this Order.

8. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless a longer time period is approved, and shall be taken in a manner

that ensures sample independence to the greatest extent feasible. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) Methods for the Analysis of Organics in Water and Wastewater (USEPA 600 Series), (2) Test Methods for Evaluating Solid Waste (SW-846, latest edition), and (3) Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan. Appropriate sample preparation techniques shall be used to minimize matrix interferences.

9. If methods other than USEPA-approved methods or Standard Methods are used, or there is a proposed alternant USEPA method than the one listed in the MRP, the proposed methodology shall be submitted for review and approval prior to use, including information showing its equivalence to the required method.
10. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., "trace" or "ND") in data from background monitoring points for that medium, the analytical method having the lowest MDL shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
11. The laboratory reporting limit (RL) for all reported monitoring data shall be set no greater than the practical quantitation limit (PQL).
12. **"Trace" results** - results falling between the MDL and the PQL - shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run.
13. Laboratory data shall not be altered or revised by the Discharger. If the Discharger observes potential lab errors, it shall identify the issue in the monitoring report and shall describe steps that will be taken to prevent similar errors in the future.
14. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs. MDLs and PQLs shall be reported.

15. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged in the laboratory report accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The **MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result.** The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.
16. All **QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and signature of a responsible person from the laboratory. **Sample results shall be reported unadjusted for blank results or spike recoveries.** In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged, but the analytical results shall not be adjusted.
17. Unknown chromatographic peaks shall be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.
18. The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative groundwater samples [Title 27, § 20415(b)(4)(B)]. Groundwater samples shall not be field-filtered prior to laboratory analysis [40 C.F.R. § 258.53(b)]. Groundwater samples needing filtering (e.g., samples to be analyzed for dissolved metals) shall be filtered by the laboratory prior to analysis.
19. Groundwater elevations shall be measured in each well immediately prior to purging, each time groundwater is sampled. The owner or operator shall determine the rate and direction of groundwater flow each time groundwater is sampled. Groundwater elevations in wells which monitor the same waste management area shall be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater flow rate and direction [40 C.F.R. § 258.53(d)].
20. Monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to

design specifications throughout the life of the monitoring program [40 C.F.R. § 258.51(c)(2)]. Monitoring devices that cannot be operated and maintained to perform to design specifications shall be replaced after review and approval of a report (i.e., work plan) for the proposed replacement devices.

21. All borings are to be logged during drilling under the direct supervision of a registered geologist or registered civil engineer with expertise in stratigraphic well logging [Title 27, § 20415(e)(2)].
22. Soils are to be described according to the Unified Soil Classification System [Title 27, § 20415(e)(2)(A)]. Rock is to be described in a manner appropriate for the purpose of the investigation [Title 27, § 20415(e)(2)(B)].
23. The Discharger shall submit a work plan for review and approval at least **60 days** prior to installation or abandonment of groundwater monitoring wells.
24. The Discharger shall provide Central Valley Water Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation or abandonment of monitoring devices.
25. The water quality protection standard shall consist of the constituents of concern (COC), concentration limits, and the point of compliance. The water quality protection standard shall apply during the active life of the waste management unit, closure period, post-closure maintenance period, and any compliance period under Title 27, section 20410 [Title 27, § 20390].
26. The point of compliance at which the water quality protection standard applies is a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit [Title 27, § 20405].
27. The compliance period is the minimum period of time during which the Discharger shall conduct a water quality monitoring program and is the number of years equal to the active life of the waste management unit plus the closure period [Title 27, § 20410(a)].
28. The groundwater monitoring system shall include a sufficient number of monitoring points, installed at appropriate locations, to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater that has not been affected by a release from the waste management unit [Title 27, § 20415(b)(1)(A)].
29. The Detection Monitoring Program shall include a sufficient number of monitoring points, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of

groundwater passing the point of compliance to allow the detection of a release from the waste management unit [Title 27, § 20415(b)(1)(B)1.].

30. Additional monitoring points shall be added as necessary to provide the best assurance of the **earliest possible detection** of a release from the waste management unit [Title 27, § 20415(b)(1)(B)2.].
31. The Detection Monitoring Program shall also include a sufficient number of monitoring points installed at appropriate depths and locations to yield groundwater samples from other aquifers or perched zones not already monitored to provide the **earliest possible detection** of a release from the waste management unit [Title 27, § 20415(b)(1)(B)3. and 4., and §20420(b)].
32. A surface water monitoring system shall be established to monitor each surface water body that could be affected by a release from the waste management unit [Title 27, § 20415(c)].
33. An unsaturated zone monitoring system shall be established for each waste management unit [Title 27, § 20415(d)].
34. The Discharger shall notify Central Valley Water Board staff within **seven days** if fluid is detected in a previously dry LCRS, unsaturated zone monitoring system, or if a progressive increase is detected in the volume of fluid in a LCRS [Title 27, § 21710(c)(3)].
35. Driller's logs for all monitoring wells shall to be submitted to the Central Valley Water Board and the Department of Water Resources [Wat. Code, § 13751 and Title 27, § 20415(b)(3)].
36. Groundwater elevation, temperature, electrical conductivity, turbidity, and pH are to be accurately measured at each well each time groundwater is sampled [Title 27, § 21415(e)(13)].
37. The groundwater 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 being monitored shall be determined at least quarterly [Title 27, § 20415(e)(15)].
38. The Discharger shall graph all analytical data from each monitoring point and background monitoring point and shall submit the graphs to the Central Valley Water Board annually [Title 27, § 20415(e)(14)].
39. For each waste management unit, the Discharger shall collect all data necessary for selecting appropriate data analysis methods for establishing background values for each constituent of concern and for each monitoring parameter [Title 27, § 20420(c)]. The Discharger shall propose a data analysis method that includes a detailed description of the criteria to be used for

determining “measurably significant” (as defined in Title 27, section 20164) evidence of a release from the waste management unit and determining compliance with the water quality protection standard [Title 27, § 20415(e)(6) and (7)].

40. For statistical analysis of data, the Discharger shall use one of the methods described in Title 27, section 20415(e)(8)(A)-(E). A non-statistical data analysis method can be used if the method can achieve the goal of the particular monitoring program at least as well as the most appropriate statistical method [Title 27, § 20415(e)(8)]. The Discharger shall use a statistical or nonstatistical data analysis method that complies with Title 27, section 20415(e)(7, 8, 9, and 10), to compare the concentration of each constituent of concern or monitoring parameter with its respective background concentration to determine whether there has been a measurably significant evidence of a release from the waste management unit. For any given monitoring point at which a given constituent has already exhibited a measurably significant indication of a release at that monitoring point, the Discharger may propose to monitor the constituent, at that well, using a concentration-versus-time plot.
41. The Discharger may propose an alternate statistical method [to the methods listed under Title 27, section 20415(e)(8)(A-D)] in accordance with Title 27, section 20415(e)(8)(E), for review and approval.
42. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Title 27, section 20415(e)(7) 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 WDRs or an approved Sample Collection and Analysis Plan for routine laboratory operating conditions that are available to the facility. The Discharger’s technical report (Sample Collection and Analysis Plan and/or Water Quality Protection Standard Report), pursuant to Title 27, section 20415(e)(7), shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, CCR, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a “trace” detection) shall be identified and used in appropriate statistical or non-statistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory’s concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of “ties”.
43. The water quality protection standard for organic compounds which are not naturally occurring and not detected in background groundwater samples shall

be taken as the detection limit of the analytical method used (e.g., USEPA methods 8260 and 8270).

44. Alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate) if part of an approved water quality protection standard. Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Central Valley Water Board staff.
45. **Confirmation of Measurably Significant Evidence of a Release.** Whenever a constituent is detected at a detection monitoring point at a concentration that exceeds the concentration limit from the water quality protection standard, the Discharger shall conduct verification sampling to confirm if the exceedance is due to a release or if it is a false-positive (unless previous monitoring has already confirmed a release for that constituent at that monitoring point). An exceedance of the concentration limit from the water quality protection standard is considered measurably significant evidence of a release that must be either confirmed or denied. There are two separate verification testing procedures:
- a. Standard Monitoring Specification I.46 provides the procedure for analytes that are detected in less than 10% of the background samples such as non-naturally occurring constituents like volatile organic compounds; and
 - b. Standard Monitoring Specification I.47 provides the procedure for analytes that are detected in 10% or greater of the background samples such as naturally occurring constituents like chloride.
46. **Verification Procedure for Analytes Detected in Less than 10% of Background Samples.** The Discharger shall use the following non-statistical method for all analytes that are detected in less than 10% of the background samples. The non-statistical method shall be implemented as follows:
- a. **Initial Determination of Measurably Significant Evidence of a Release.** Identify each analyte in the **current** detection monitoring point sample that exceeds either its respective MDL or PQL, and for which a release has not been previously confirmed. The Discharger shall conclude that the exceedance provides a preliminary indication of a release or a change in the nature or extent of the release, at that monitoring point, if **either**:
 - 1) The data contains two or more analytes that equal or exceed their respective MDLs; or
 - 2) The data contains one or more analyte that equals or exceeds its PQL.

b. **Discrete Retest** [Title 27, § 20415(e)(8)(E) and § 20420(j)(1-3)]:

- 1) In the event that the Discharger or Central Valley Water Board staff concludes (pursuant to paragraph I.46.a., above) that there is a preliminary indication of a release, then the Discharger shall **immediately** notify Central Valley Water Board staff by phone or e-mail and, within **30 days** of such indication, shall collect two new (retest) samples from the monitoring point where the release is preliminarily indicated and analyze them for the constituents that caused the need for the retest.
- 2) **Confirmation of a Release.** As soon as the retest data are available, the Discharger shall conclude that measurably significant evidence of a release is confirmed if (not including the original sample) two or more analytes equal or exceed their respective MDLs or if one or more analyte equals or exceeds its PQL. The Discharger shall then:
 - a) **Immediately** verbally notify the Central Valley Water Board whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of the verbal notification; and
 - b) Carry out the requirements of Section J, **RESPONSE TO A RELEASE** if a release has been confirmed.
 - c) Add any five-year analyte that is confirmed per this method to the monitoring parameter list such that it is monitored during each regular monitoring event.

47. **Verification Procedure for Analytes Detected in 10% or Greater of the Background Samples.** The Discharger shall use either a statistical or non-statistical method pursuant to Title 27, section 20415(e)(8)(E) for all analytes that are detected in 10% or greater of the background samples. The Discharger shall use one of the statistical methods required in Title 27, section 20415(e)(8)(E) unless another method has been proposed by the Discharger in a Water Quality Protection Standard Report (or equivalent report) and approved by the Central Valley Water Board in a Monitoring and Reporting Program pursuant to Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E). The method shall be implemented as follows:

- a. **Initial Determination of Measurably Significant Evidence of a Release.** The Discharger shall compare the value reported by the laboratory for each analyte to the statistically-derived concentration limit from the most recent report (Annual Monitoring Report or Water Quality Protection Standard Report) that uses the approved statistical procedure. If the value exceeds

the concentration limit for that constituent, the Discharger shall conclude that there is measurably significant evidence of a release [Title 27, § 20420(i)].

b. **Retest Method** [Title 27, § 20415(e)(8)(E) and § 20420(j)(1-3)].

- 1) In the event that the Discharger or Central Valley Water Board staff concludes (pursuant to paragraph I.47.a., above) that there is a preliminary indication of a release, then the Discharger shall **immediately** notify Central Valley Water Board staff by phone or e-mail and, within **30 days** [Title 27, § 20415(e)(3)] of such indication, the Discharger shall implement a verification procedure/retest option, in accordance with Title 27, sections 20415(e)(8)(E) and 20420(j)(2). The verification 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) [Title 27, § 20415(e)(8)(E)]. The Discharger may use an alternate method previously approved by the Central Valley Water Board and included in the Monitoring and Reporting Program. The verification procedure shall comply with the requirements of Title 27, section 20415(e)(8)(E) in addition to the performance standards of Title 27, section 20415(e)(9). The retest samples shall be collected from the monitoring point where the release is preliminarily indicated and shall be analyzed for the constituents that caused the need for the retest. For any indicated monitoring parameter or constituent of concern, if the retest results of one or more of the retest data suites confirm the original indication, the Discharger shall conclude that measurably significant evidence of a release has been confirmed.
- 2) **Confirmation of a Release.** As soon as the retest data are available, the Discharger shall evaluate the results pursuant to paragraph I.47.b.1, above and shall:
 - a) **Immediately** verbally notify the Central Valley Water Board whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of the verbal notification; and
 - b) Carry out the requirements of Section J, **RESPONSE TO A RELEASE** if a release has been confirmed.
 - c) Add any five-year analyte that is confirmed per this method to the monitoring parameter list such that it is monitored during each regular monitoring event.

48. Physical Evidence of a Release. If the Discharger determines that there is a significant **physical** evidence of a release, the Discharger shall immediately verbally notify Central Valley Water Board staff and provide written notification **by certified mail within 7 days** of such determination, and within **90 days** shall submit an amended report of waste discharge to establish an Evaluation Monitoring Program [Title 27, § 20385(a)(3) and § 20420(l)(1) & (2)].

J. RESPONSE TO A RELEASE

1. Measurably Significant Evidence of a Release Has Been Confirmed. If the Discharger has confirmed that there is measurably significant evidence of a release from a waste management unit pursuant to Standard Monitoring Specification I.46 or I.47, then the Discharger shall:

- a. **Immediately** sample all monitoring points in the affected medium at that waste management unit and determine the concentration of all monitoring parameters and constituents of concern for comparison with established concentration limits. Because this constituent of concern scan does not involve statistical testing, the Discharger will need to collect and analyze only a single water sample from each monitoring point in the affected medium [Title 27, § 20420(k)(1)].
- b. **Within 14 days** of confirming measurably significant evidence of a release, the Discharger shall (for releases from MSW landfill units) notify all persons who own the land or reside on the land that directly overlies any portion of the plume of contamination if contaminants have migrated off-site if indicated by sampling of detection monitoring wells [40 C.F.R. § 258.55(g)(1)(iii)].
- c. **Within 90 days** of confirming measurably significant evidence of a release, the Discharger shall submit an amended report of waste discharge to establish an Evaluation Monitoring Program meeting the requirements of Title 27, sections 20420(k)(5)(A-D), including but not limited to the results of sampling pursuant to paragraph J.1.a, above. The Evaluation Monitoring Program shall be designed for the collection and analysis of all data necessary to assess the nature and extent of the release and to determine the spatial distribution and concentration of each constituent throughout the zone affected by the release [Title 27, § 20420(k)(5) and § 20425(b)]. For releases from MSW landfill units, the Evaluation Monitoring Program shall also include any additional proposals necessary to comply with 40 C.F.R. § 258.55, particularly the additional monitoring well required by 40 C.F.R. § 258.55(g)(1)(ii).
- d. **Within 180 days** of confirming measurably significant evidence of a release, the Discharger shall submit to the Central Valley Water Board an initial engineering feasibility study for a Corrective Action Program

necessary to meet the requirements of Title 27, section 20430. At a minimum, the initial engineering 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 [Title 27, § 20420(k)(6)].

- e. If the Discharger confirms that there is measurably significant evidence of a release from the waste management unit at any monitoring point, the Discharger may attempt to 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 groundwater, surface water, or the unsaturated zone. The Discharger may make a demonstration pursuant to Title 27, section 20420(k)(7) in addition to or in lieu of submitting both an amended report of waste discharge or an engineering feasibility study; however, the Discharger is not relieved of the requirements and due dates of Title 27, sections 20420(k)(6) & (7) unless Central Valley Water Board staff agree that the demonstration 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 statistical evaluation or from natural variation in groundwater, surface water, or the unsaturated zone. In order to make this demonstration, the Discharger shall notify the Central Valley Water Board by certified mail of the intent to make the demonstration **within seven days** of determining measurably significant evidence of a release, and shall submit a report **within 90 days** of determining measurably significant evidence of a release [Title 27, § 20420(k)(7)].
- f. **Within 90 days** of the date that the Evaluation Monitoring Program from paragraph J.1.c is approved (the date is it established), the Discharger shall complete and submit the following:
 - i) **Results and Assessment for the Evaluation Monitoring Program.** A report with the results and assessment based on the approved Evaluation Monitoring Program [Title 27, § 20425(b)].
 - ii) **Updated Engineering Feasibility Study.** An updated engineering feasibility study for corrective action based on the data collected to delineate the release and data from the ongoing monitoring program required under Title 27, section 20425(e) [Title 27, § 20425(c)].
 - iii) **Amended ROWD for a Corrective Action Program.** An amended report of waste discharge to establish a Corrective Action Program meeting the requirements of Title 27, section 20430 based on the data collected to delineate the release and based on the updated engineering feasibility study [Title 27, § 20425(d)].

- g. The Discharger shall (for releases from MSW landfill units) discuss the results of the updated engineering feasibility study, prior to the final selection of a remedy, in a public meeting with interested and affected parties [40 C.F.R. § 258.56(d)].

K. GENERAL PROVISIONS

1. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Central Valley Water Board office by telephone **as soon as** it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.
2. All reports and transmittal letters shall be signed by persons identified below:
 - a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor.
 - c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
 - d. A duly authorized representative of a person designated in a, b or c above if:
 - 1) The authorization is made in writing by a person described in a, b, or c of this provision;
 - 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility (a duly authorized representative may thus be either a named individual or any individual occupying a named position); and
 - 3) The written authorization is submitted to the Central Valley Water Board.

- e. Any person signing a document under this Section shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”

3. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.
4. The owner of the waste management facility shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and from gases and leachate generated by discharged waste during the active life, closure, and post-closure maintenance period of the waste management units and during subsequent use of the property for other purposes.
5. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of this Order.
6. The Discharger shall notify the Central Valley Water Board of a material change in; the types, quantity, or concentrations of wastes discharged; site operations and features; or proposed closure procedures, including changes in cost estimates. This notification shall be given a reasonable time before the changes are made or become effective. No changes shall be made without Central Valley Water Board approval following authorization for closure pursuant to the site Notification of Closure [Title 27, § 21710(a)(4)].
7. The Discharger shall maintain legible records of the volume and type of each waste discharged at each waste management unit or portion of a unit, and the manner and location of discharge. Such records shall be maintained by the Discharger until the beginning of the post-closure maintenance period. These records shall be on forms approved by the State Water Board or Central Valley Water 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 Water Board or Central Valley Water Board 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 Central Valley Water Board [Title 27, § 21720(f)].

8. In the event of any change in landowner or the operator of the waste management facility, the Discharger shall notify the succeeding owner or operator in writing of the existence of this Order. A copy of that notification shall be sent to the Central Valley Water Board.
9. In the event of any change of ownership or responsibility for construction, operation, closure, or post-closure maintenance of the waste discharge facilities described in this Order, the Discharger shall notify the Central Valley Water Board prior to the effective date of the change and shall include a statement by the new Discharger that construction, operation, closure, or post-closure maintenance will be in compliance with this Order and any revisions thereof [Title 27, § 21710(c)(1)].
10. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Central Valley Water Board requesting transfer of the Order within **14 days** of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory requirements contained in General Provision K.2 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. Transfer of this Order shall be approved or disapproved by the Central Valley Water Board.

L. STORM WATER PROVISIONS

1. New and existing Class III landfills shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return period [Title 27, § 20260(c)].
2. New and existing Class II landfills shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return period [Title 27, § 20250(c)].
3. The Discharger shall design storm water conveyance systems for Class III units for a 100-year, 24-hour storm event, and shall design storm water conveyance systems for Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].
4. MSW landfills located in a 100-year floodplain shall demonstrate that the landfill unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to pose a hazard to human health or the environment [40 C.F.R. § 258.11(a)].

5. Waste management units and their respective 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 for the unit [Title 27, § 20365(a)].
6. Precipitation on landfills or waste piles which is not diverted by covers or drainage control systems shall be collected and managed through the LCRS, which shall be designed and constructed to accommodate the precipitation conditions for each class unit [Title 27, § 20365(b)].
7. Diversion and drainage facilities shall be designed, constructed, and maintained to [Title 27, § 20365(c)]:
 - a. accommodate the anticipated volume of precipitation and peak flows from surface runoff and under the precipitation conditions for the waste management unit:
 - b. effectively divert sheet flow runoff laterally, via the shortest distance, into the drainage and collection facilities;
 - c. prevent surface erosion;
 - d. control and intercept run-on, in order to isolate uncontaminated surface waters from water that might have come into contact with waste;
 - e. take into account:
 - i) for closed waste management units and for closed portions of units, the expected final contours of the closed unit, including its planned drainage pattern;
 - ii) for operating portions of waste management units other than surface impoundments, the unit's drainage pattern at any given time;
 - iii) the possible effects of the waste management unit's drainage pattern on and by the regional watershed;
 - iv) the design capacity of drainage systems of downstream and adjacent properties by providing for the gradual release of retained water downstream in a manner which does not exceed the expected peak flow rate at the point of discharge if there were no waste management facility; and
 - f. preserve the system's function. The Discharger shall periodically remove accumulated sediment from the sedimentation or detention basins as needed to preserve the design capacity of the system.

8. 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 [Title 27, § 20365(d)].
9. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].
10. 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 [Title 27, § 20365(f)].
11. Any drainage layer in the final cover shall be designed and constructed to intersect with the final drainage system for the waste management unit in a manner promoting free drainage from all portions of the drainage layer [Title 27, §20365(f)].