CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2018-0007

WASTE DISCHARGE REQUIREMENTS FOR RECOLOGY OSTROM ROAD RECOLOGY OSTROM ROAD LANDFILL CLASS II LANDFILL CLASS II SURFACE IMPOUNDMENTS BIOSOLIDS SLUDGE DRYING BEDS CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE MAINTENANCE AND CORRECTIVE ACTION YUBA COUNTY

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

1. Recology Ostrom Road ("Discharger"), a wholly owned subsidiary of Recology, Inc., owns and operates the Recology Ostrom Road Landfill ("Facility"). The site is located in unincorporated Yuba County and is immediately south of Ostrom Road approximately six miles east of State Highway 65 and one mile east of Jasper Lane. Nearby population centers include the City of Marysville approximately fourteen miles northwest of the site, and the City of Wheatland about five miles southwest of the site. The site occupies portions of Sections 10, 11, 14 and 15 of Township 14 North, Range 5 East, Mount Diablo Base Meridian (MDBN), as shown in Attachment A. 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 part 258, in accordance with State Water Resources Control Board (State Water Board) Resolution 93-62.

2. The following attached documents are incorporated as part of this Order:

   a. Attachment A – Site Location Map

   b. Attachment B – Predevelopment Topography Map

   c. Attachment C – Water Supply Wells Within 1-mile Radius

   d. Attachment D – Floodplain Map

   e. Attachment E – Existing and Future Proposed Site Plan

   f. Attachment F – Existing Facility Monitoring System Locations (Groundwater Regional Zone, Unsaturated Zone, and Surface Water)

   g. Attachment G– Existing Groundwater Shallow Zone Monitoring System Locations

   h. Attachment H – Existing Landfill Gas Extraction and Monitoring and Map

i. Attachment I – Proposed Landfill Base Grading Plan

j. Attachment J – Proposed Final Closure Cover Drainage Plan

k. Attachment K – Regional and Shallow Groundwater Elevation Contour Maps

l. Attachment L – Side Slope And Sump Liner Design

m. Attachment M – Proposed Engineered Alternative Liner Design

n. Attachment N – Information Sheet

o. Attachment O – Standard Provisions and Reporting Requirements for Landfills, dated December 2015 (Landfill SPRRs); and

p. Attachment P – Standard Provisions and Reporting Requirements for Class II Surface Impoundments dated April 2016 (Class II SPRRs).

3. The 261-acre Facility is comprised of Assessor's Parcel Number (APN) 15-080-17. The Facility has been in operation since 1995, and to date, approximately 70 acres out of a total landfill development of 225 acres has been constructed and approved for operation. The pre-disposal topography is shown in Attachment B. As shown, the pre-disposal topography is relatively flat and slopes gently from east to west. The Facility is currently permitted to develop and operate two separate Class II waste disposal modules (Waste Management Units (WMUs) 1 and 2) with a total footprint of 221 acres. The disposal WMUs are separated by a former 40-foot wide 4-acre access easement. The Discharger proposes to incorporate the respective WMUs to form a single contiguous disposal footprint of 225 acres as shown in Attachment B. The two disposal WMUs will ultimately consist of 18 cells (Cells 1A through 9A and 1B through 9B).

4. The Discharger's current plans indicate that the landfill will reach capacity by the year 2102. Site life calculations are based on a remaining refuse capacity as of 30 June 2016 of approximately 24,395,000 tons, which assumes a compacted effective refuse density of 1,395 pounds per cubic yard and accounts for settlement.

5. On 13 December 2016, the Discharger submitted a revised Report of Waste Discharge (ROWD) as part of the Joint Technical Document (JTD) for the landfill ROWD/JTD. The December 2016 ROWD/JTD was revised in June 2017 (Revision 10). On 3 November 2017 the Discharger provided an amended ROWD. The information in the ROWD/JTD has been used in revising these waste discharge requirements (WDRs). The ROWD contains the applicable information required in Title 27. The ROWD/JTD and supporting documents contain information related to this revision of the WDRs which include the following:

   a. Specifications that the Discharger provide a recommended two percent (minimum one percent) downward post settlement slope towards the leachate collection and removal system (LCRS) sump between all points on the base of each future waste management unit (WMU) cell to ensure proper functionality of its LCRS throughout the life of the WMU.

b. Specifications that the Discharger maintain 2.5 feet separation between highest anticipated groundwater elevation including capillary fringe and waste along the base and side slopes of new and existing WMUs. This requirement is applicable to separation from any regional and shallow (perched) groundwater conditions that currently exist at the Facility.

c. Specifications that require the Discharger to provide a “capillary break” between highest anticipated groundwater including capillary fringe and waste along the base and side slope of any existing and future WMU to ensure minimum siting criteria separation including any approved engineered alternative is maintained.

d. Specifications that require the unsaturated zone detection monitoring system to be installed directly below the lowest point in the single composite liner system and in direct communication with the unsaturated zone where an unsaturated zone exists at all times.

e. Provisions requiring the Discharger to submit a preliminary base and side slope liner design and unsaturated zone monitoring system for future WMU cells that complies with Finding 5, Items a through d.

f. Provisions requiring the Discharger to submit work plan detailing necessary corrective action to ensure 2.5 feet of separation between groundwater including capillary fringe and the base and side slopes of existing WMU 1. The separation requirement applies to shallow and regional groundwater zones.

g. Provisions requiring the Discharger to assess the need for additional corrective action for a known ongoing release of volatile organic compounds (VOCs) from WMU 1 to the unsaturated and groundwater zones.

h. Provisions requiring The Discharger to submit a work plan to include surface water monitoring of its stormwater sedimentation basins and update its WQPS and Sampling and Analysis Plan.

i. Provisions requiring the Discharger to investigate whether stormwater collection, conveyance, and storage at and around the facility is inhibiting the Discharger from collecting representative unsaturated zone and groundwater samples for its detection water quality monitoring program and/or causing the Discharger to violate the Facility's groundwater separation requirements.

j. Provisions requiring The Discharger to characterize onsite materials used as an operations layer (operations soil) during construction of any new WMU cell to ensure that the operations layer does not inhibit leachate from reaching the WMU leachate collection and removal system (LCRS).

k. Provisions that require the Discharger to perform a revised leachate and gas condensate water balance for the facility to determine necessary leachate and gas condensate storage capacity in existing leachate and gas condensate storage tanks and/or a future Class II surface impoundment prior to onset of the wet season.

l. Provisions requiring the Discharger shall certify landfill stability in accordance with Title 27 section 21750 subdivision (f)(5) based on the shallow groundwater zone along the side slopes and base of WMU cells.

m. Clarification of prohibitions, limitations, and specifications related to return of leachate and gas condensate to a WMU.

n. Clarification on the prohibitions, limitations, and specifications related to storage, dewatering, and disposal of dewatered sewage and water treatment sludge at a proposed Biosolids Management Facility (BMF).

o. Revised specification for minimum final closure cover components and requirement that the Discharger submit a final closure cover design report that complies with Title 27 section 21090 subdivision (a).

p. Update to include the addition of new wood waste coloring operation at the Facility (JTD amendment approved June 2016).

q. Requirement for Discharger to report current concentration limits for groundwater, unsaturated zone, and surface water with each monitoring report.

r. Updated Closure and Postclosure cost estimates per current wage and equipment rates.

s. Updated Seismic Hazard Evaluation.

t. Changes to the way the Discharger determines whether it must perform EPA method TO-15 gas analysis for VOCs based on unsaturated zone gas sampling for methane and total volatile organic compounds (VOCs).

u. Updates which include current corrective action measures and associated additional monitoring requirements to determine the effectiveness of the Discharger's current corrective action program.

6. The Facility was originally permitted as a Class III Facility and regulated by WDRs Order No. 94-306 adopted by the Central Valley Water Board in October 1994, and Solid Waste Facilities Permit (SWFP) No. 58 AA 0011 adopted by the California Integrated Waste Management Board (CIWMB) on December 15, 1993. An application for Class II WDRs for the Facility was submitted to the Central Valley Water Board on 23 January 1996. The application package included a December 1995 addendum to the ROWD, which addressed site drainage and landfill stability under Class II requirements. The drainage and stability analyses in this addendum were included in the *Class II Permit Revision Report for Surface Water Drainage and Seismic Slope Stability Analysis* prepared by Anderson Consulting Group. Based on this application package, the Facility on 9 August 1996 was permitted as a Class II Facility (WDR Order No. 96-218) for the discharge of non-hazardous waste, municipal solid waste, and designated waste. This Order continues to classify the landfill units as Class II units in accordance with Title 27.

7. The existing and future landfill units authorized by this Order are described as follows:

WMU	Area	Liner/LCRS[1] Components[2]	Unit Classification & Status
WMU 1, Cell 1, Phases 1-2; and Cell 2A, Phases 1[3]-2	Varies	Base floor liner system consists of from top to bottom: 12-inches of operations soil; 8-oz. geotextile filter fabric; 12-inch thick LCRS gravel[4]; 60-mil HDPE geomembrane and; 24-inches of low-permeability soil liner[5]. Side slope liner system consists of from top to bottom: 24-inches of operations soil; LCRS geocomposite drainage layer; 60-mil HDPE geomembrane and; 24-inches of low-permeability soil liner[5].	Class II, Active.
WMU 1, Cell 2B, Phase 3	6.9 acres	Base floor liner system consists of from top to bottom: 12-inches of operations soil; an 8-oz. geotextile filter fabric; 12-inch thick LCRS gravel[4]; 60-mil HDPE geomembrane, 30-inches of low-permeability soil liner[5], 8-oz leak detection geocomposite; 60-mil HDPE geomembrane and; 24-inches of low-permeability soil liner. Side slope liner system consists of from top to bottom: 24-inches of operations soil; LCRS geocomposite drainage layer; 60-mil HDPE geomembrane and; 30-inches of low-permeability soil liner[5].	Class II, Active.

[1] LCRS – Leachate collection and removal system.

[2] All liner systems are composite liner systems unless otherwise noted.

[3] Cell 2, Phase 1 sump was constructed with a 2.5-feet-thick gravel vadose zone to provide a capillary break beneath the liner system.

[4] Hydraulic conductivity greater than or equal to 1 cm/s.

[5] Hydraulic conductivity less than or equal to 1×10^{-7} cm/s.

WMU	Area	Liner/LCRS[1] Components[2]	Unit Classification & Status
WMU 1, Cell 1, Phase 4; Cell 3, Phases 1-2; and Cell 2, Phase 4	Varies	Base floor liner system consists of from top to bottom: 12-inches of operations soil; a 8-oz. geotextile filter; 12-inch thick LCRS gravel[4, 6,] 60-mil textured HDPE geomembrane; leak detection system consisting of a minimum 24-inches of low-permeability soil[5] plus additional 6-inches of "foundation" soil, geocomposite leak detection drainage layer, and a 60-mil HDPE geomembrane; and subgrade. Side slope liner system consists of from top to bottom: 24-inches of operations soil; LCRS geocomposite drainage layer; 60-mil HDPE geomembrane; minimum 24-inches of low-permeability soil[5] plus an additional 6-inches of "foundation" soil; secondary 60-mil HDPE geomembrane; and subgrade.	Class II, Active.
WMU 1, Cells 4-5; WMU 2, Cells 6-9	To Be Determined	To be determined. See Specifications section D for minimum base floor and side slope liner system requirements.	Class II, Future
Class II Surface Impoundment	To Be Determined	Prepared subgrade overlain with GCL, 60-mil HDPE geomembrane, geocomposite LCRS drainage layer, and 60-mil HDPE geomembrane.	**Class II. Future.** If used to accept leachate and gas condensate from WMU 1 and WMU 2
Class II Surface Impoundments	Two, up to 5-acres each	Prepared subgrade overlain with GCL, 60-mil HDPE geomembrane, geocomposite LCRS drainage layer, and 60-mil HDPE geomembrane.	**Class II. Future.** Will accept dewatered sewage and sludge for drying in Biosolids Sludge Drying Beds.
Biosolids Sludge Drying Beds	10.5 acres total	Prepared subgrade consisting of low permeability soils overlain with 60-mil HDPE geomembrane, LCRS drainage layer, and 2-feet of operations layer.	**Class II. Future.** To be used for drying dewatered sewage and sludge prior to disposal in WMUs or diversion for beneficial reuse.

8. Other existing on-site facilities (see Attachment E) at the Recology Ostrom Road Landfill include: temporary scale facilities, a hazardous waste storage bin, temporary trailer for administrative offices, an active landfill gas extraction system, a landfill gas flare, a landfill

6 LCRS gravel thickness reduced to 9 inches on WMU 1, Cell 3 Phase 2.

gas to energy facility (LFGTE), a temporary concrete processing area, and a wood mulching and coloring operation that processes wood materials into different consumer products.

9. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated federal MSW regulations under the former "Subtitle D" of Resource Conservation and Recovery Act (RCRA). These MSW regulations are codified under 40 Code of Federal Regulations part 258. Notwithstanding the subsequent reorganization of RCRA, the federal MSW regulations will be referred to herein as either "Subtitle D," or alternatively, "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.

10. 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-H of these WDRs, and in the Landfill SPRRs and Class II SPRRs (incorporated herein). Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) No. R5-2018-0007, and in the applicable SPRRs. Generally, requirements that are regulation-based, or otherwise applicable to all MSW landfills, are considered "standard"; for this reason, they are included in the applicable SPRRs. Any site-specific changes to a requirement in the applicable SPRRs are included in the applicable section (A through H) of these WDRs, and the requirement in the WDRs supersedes the requirement in the applicable SPRRs.

11. 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 AND UNIT CLASSIFICATION

12. The Discharger proposes to continue to discharge nonhazardous solid waste, including municipal solid waste, inert construction and demolition (C&D) debris, and nonhazardous C&D to lined Class II landfill units at the Facility. Non-hazardous solid wastes include municipal solid waste, sludge, and special wastes. Other wastes requiring special handling include asbestos containing waste (ACW), food processing wastes, dead animals, agricultural wastes, tires, and ash. These classified wastes may be discharged only in accordance with Title 27, Resolution 93-62, and Subtitle D (40 C.F.R. part 258) as required by this Order.

13. The Discharger also proposes to continue to discharge designated waste to Class II landfill units including but not limited to contaminated non-hazardous soil (C-Soil), industrial sludges, dredge debris, slab/construction/demolition debris, treated wood,

commercial/industrial waste, dewatered sewage and water treatment sludge. These classified wastes may be discharged only in accordance with Title 27, Resolution 93-62 and Subtitle D (40 C.F.R. part 258) as per this Order.

14. Water Code section 13173 defines “Designated Waste” as either of the following:

    a. Hazardous waste that has been granted a variance from hazardous waste management requirements pursuant to Health and Safety Code section 25143.

    b. Nonhazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a WMU, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan.

    Designated waste can be discharged only at Class I WMUs; or at Class II WMUs that comply with Title 27, and have been approved by the Central Valley Water Board for containment of the particular kind of waste to be discharged.

15. The Discharger proposes to continue to discharge wastes containing greater than one percent (>1%) friable asbestos to the landfill units. These wastes are classified as ‘hazardous’ under California Code of Regulations, title 22 (Title 22). However, these wastes do not pose a threat to groundwater quality and California Health and Safety Code, section 25143.7 permits their disposal in any landfill that has WDRs that specifically permit the discharge, provided that the wastes are handled and disposed of in accordance with applicable statutes and regulations.

16. The landfill accepts asbestos-containing wastes (ACW), consistent with section 25143.7 of the Health and Safety Code and section 17897 of Title 14 CCR.

17. The landfill currently accepts dewatered sewage sludge (biosolids) and proposes to accept other wastes requiring special handling (“special wastes”, as defined in Title 27). Wastes requiring special handling include food processing wastes, dead animals, agricultural wastes, tires, and ash.

18. In addition to waste disposal operations, the Discharger proposes to construct a Biosolids Management Facility (BMF). The BMF (see Attachment E) will accept and store de-watered sewage sludge and water treatment sludge in future Class II surface impoundment(s) to be temporarily located in WMU 2, cell 7A and cell 8A footprint. Cell 8A may include up to two 5-acre Class II surface impoundments in which each surface impoundment can store up to 25,000 tons of dewatered sewage and water treatment sludge during the winter months. The sewage and sludge will be stored in the surface impoundment(s) during the wet season and removed from the WMU to Biosolids Sludge Drying Beds (BSDBs) at the beginning of the dry season for drying the sewage and sludge to avoid having to mix the waste with other materials to increase its moisture holding capacity prior to disposal in the WMUs or diversion for beneficial reuse. The Class II surface impoundment(s) are contained within the permitted footprint of the Class II landfill and will be clean-closed as the site is developed.

19. The Discharger proposes to conduct sewage and sludge drying operations in a 10.5-acre BSDBs area to be constructed in WMU 2 (see Attachment E). The BSDBs will be constructed using a liner system to limit the discharge of waste containing constituents of concern (COCs). The Discharger proposes to remove all waste from the BSDBs prior to onset of the wet season (by 15 October).

20. The Discharger proposes to continue to discharge treated wood waste in the composite-lined units at the landfill. Title 22 of the California Code of Regulations (Title 22) defines "treated wood" as wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act. (7 U.S.C. § 136 et seq.) This may include but is not limited to waste wood that has been treated with chromated copper arsenate (CCA), pentachlorophenol, creosote, acid copper chromate (ACC), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), or chromated zinc chloride (CZC).

21. Title 22, section 67386.11 allows treated wood waste to be discharged to a composite-lined portion of a MSW landfill that is regulated by WDRs issued pursuant to the Water Code provided that the landfill owner/operator:

    a. Comply with the following prohibitions in Title 22, section 67386.3:

        i. Treated wood waste shall not be burned, scavenged, commingled with other waste prior to disposal, stored in contact with the ground, recycled without treatment (except as in paragraph a.iii, below), treated except in compliance with Title 22, section 67386.10, or disposed to land except in compliance with Title 22, section 67386.11.

        ii. Any label or mark that identifies the wood and treated wood waste shall not be removed, defaced, or destroyed.

        iii. Treated wood waste may be recycled only by reuse when all of the following apply:

            (1) Reuse is on-site.

            (2) Reuse is consistent with FIFRA approved use of the preservative.

            (3) Prior to reuse, treated wood waste is handled in compliance with Title 22, division 4.5, chapter 34.

    b. Ensure treated wood waste is managed at the landfill according to Title 22, division 4.5, chapter 34 prior to disposal.

    c. Monitor the landfill for a release of constituents of concern associated with treated wood wastes and if a verified release is detected from the unit where treated wood is discharged, the disposal of treated wood will be terminated at the unit with the verified release until corrective action remediates the release.

    d. Handle treated wood waste in a manner consistent with the applicable sections of the California Occupational Safety and Health Act of 1973.

22. Title 27, section 20690 allows the use of alternative daily cover (ADC) at MSW landfills upon approval by the Local Enforcement Agency (LEA) and concurrence from CalRecycle. Title 27, section 20705 provides the Water Board's regulations for all daily and intermediate cover including that it shall minimize the percolation of liquids through waste and that the cover shall consist of materials that meet the landfill unit classification (Class II or Class III). The regulations also require that for non-composite lined portions of the landfill, that any contaminants in the daily or intermediate cover are mobilized only at concentrations that would not adversely affect beneficial uses of waters of the state in the event of a release. For composite-lined portions of the landfill, the regulations require that constituents and breakdown products in the cover material are listed in the water quality protection standard.

23. The Discharger uses the following materials for ADC: earthen materials, processed green materials and/or construction demolition waste (which includes processed C&D fines and unders), green waste, geosynthetic blankets and plastic tarps, foam products, ash and cement kiln dust, treated auto-shredder waste, spray applied cementitious waste, compost, contaminated soils, shredded tires, and non-hazardous sludge materials originating from the treatment of municipal wastewater where the sludge material contains at least 50 percent solids (by weight). The Discharger has demonstrated that these materials will minimize percolation of liquids through waste, that they meet the unit classification where they will be discharged, and that the constituents and breakdown products are included in the water quality protection standard.

24. Landfills propose new ADC materials regularly in order to preserve landfill air space and to beneficially reuse waste materials. Title 27, section 20686 includes regulations for beneficial reuse, including use of ADC. Approval of ADC is primarily handled by the LEA and CalRecycle under Title 27, section 20690. This Order allows any ADC proposed for use at the Facility after the adoption of this Order to be approved by Central Valley Water Board staff provided the Discharger has demonstrated it meets the requirements in Title 27, section 20705. This Order also includes a requirement that ADC only be used in internal areas of the landfill unless the Discharger demonstrates that runoff from the particular ADC is not a threat to surface water quality. The demonstration can take sedimentation basins into account.

25. The Discharger proposes to return leachate and landfill gas condensate to the composite-lined landfill units from which they came. Title 27, section 20340, subdivision (g) requires that leachate be returned to the unit from which it came or be discharged in a manner approved by the Central Valley Water Board. This section of Title 27 also references State Water Board Resolution 93-62, regarding liquids restrictions in 40 C.F.R. section 258.28 for MSW landfills. 40 C.F.R. section 258.28 states that liquid waste may not be placed in MSW landfill units unless the waste is leachate or gas condensate derived from the landfill unit and it is designed with a composite liner and an LCRS. Therefore, leachate and landfill gas condensate from composite lined units with an LCRS may be returned to the unit from which they came. Furthermore, Title 27 sections 20200 subdivision (d), 20220 subdivision (c), and 20340 subdivision (g) limits the use of leachate and landfill gas condensate to dust control purposes (non-disposal of liquids). This Order includes requirements for returning leachate and landfill gas condensate back to composite-lined units such that the liquid waste is not exposed to surface water runoff, will not cause instability of the landfill, will not seep from the edges of the units, and is returned for non-disposal purposes (i.e., dust control only).

SITE DESCRIPTION

26. The site is located on the eastern portion of the Sacramento Valley, on a relatively flat, broad plain that stretches from the foothills of the Sierra Nevada on the east to the Feather River on the west. The majority of the site was leveled for rice production by a previous owner and therefore does not exhibit any significant natural relief.

27. The geology of the site and surrounding region is dominated by westward-dipping Cretaceous and Quaternary sedimentary units. In the Central Valley, these sedimentary units can be up to 2,000 feet thick. These sedimentary units are underlain at depth by granite basement rocks of the Sierra Nevada and precretaceous metamorphic rocks. The metamorphic rocks are exposed approximately two miles east of the site.

28. Geologic units at the site include the following from youngest to oldest: (1) Younger alluvium; (2) Older Alluvium; (3) Pliocene Laguna Formation; and (4) Miocene-Pliocene Mehrten Formation. The younger alluvium generally consists of thin deposits of unconsolidated gravel, sand, and silt. These deposits have been primarily mapped as Holocene alluvium and Basin deposits within active stream channels in the site vicinity. Basin deposits are the older, finer-grained distal facies of the alluvium. The older alluvium consists of poorly consolidated, reddish gravel, sand, silt, and clay. This geologic unit occurs at the ground surface over much of the site and surrounding area and is the geologic unit encountered below the landfill base grades. This unit has been referred to as the Victor Formation by previous site studies (EMCON, 1992). The older alluvium is distinguished from the younger alluvium by the presence of a mature soil profile containing a dense, clay-rich B-horizon.

29. Groundwater in the site vicinity occurs within the younger alluvium, older alluvium, and Laguna Formation. These units consist of coarse-grained bodies of sand and gravel contained within a matrix of silt and clay. The more permeable sands and gravels are generally connected hydraulically by direct contact or through the less permeable silt and clay. Groundwater is generally unconfined, although some localized confinement can occur. Groundwater is primarily recharged by percolation of rainfall and surface water along the eastern boundary of the valley, and through the Yuba, Bear, and Feather Rivers, where the sediments are coarser-grained and more permeable. In the past, the Discharger stated that percolation of tail water from irrigated fields was also a significant source of groundwater recharge. Percolation in the vicinity of the site is generally low wherever the low-permeability B-soil horizon (a feature of the older alluvium) has not been disrupted. Percolating vadose water may collect in coarse-grained soil lenses as it migrates downward. Groundwater occurs in the uppermost aquifer (Regional Zone) in coarse-grained units comprised primarily of sands and gravels. Current depth-to-water measurements in Regional Zone groundwater monitoring wells generally range from 30 feet below ground surface (bgs) (upgradient) to 45 feet bgs (downgradient). Regional Zone groundwater flow direction is toward the west.

30. Shallow perched vadose water (Shallow Zone) occurs seasonally in some areas in coarse-grained units within the vadose zone (at depths between 10 and 25 feet bgs). Based on grain-size distribution tests completed on soils at the site, EFW (1998) estimated a capillary rise of 2.5 feet for the sandy clay samples and 0.1 to 2.5 feet for sand and gravel samples with varying amounts of silts and clays. Published capillary rise data for other fine-grained soils typically range from 2 to 6 feet (EFW, 1998). Both

groundwater levels and capillary rise levels are expected to fluctuate seasonally. EFW (1998) concluded that a reasonable average capillary rise across the site at any point in time is approximately 2.5 feet.

31. Field permeability tests performed by EMCON (1983) on the upper 5 to 15 feet of soils measured in-situ permeability values between 1×10^{-5} to 2×10^{-6}cm/sec. Slug tests performed by EFW on the water bearing zones resulted in measured permeability values of 1×10^{-3} to 1×10^{-6} cm/sec with a geometric mean of 7×10^{-4} cm/sec.

32. The closest known faults are part of the Foothills fault zone located five miles east of the Facility, which has an estimated maximum credible earthquake (MCE) moment magnitude of 6.5. The Facility is located on a thick sequence of soil. In addition, the motion along the Foothills fault zone is normal-slip and not strike-slip. Therefore, the calculated peak ground acceleration (PGA) is increased by 20 percent to account for the normal-slip motion. This results in a design PGA of 0.36g based on a maximum credible earthquake (MCE). In August 2016, the Discharger's consultant, Golder Associates (Golder) completed an updated seismic hazard evaluation for the Recology Ostrom Road facility. Based on the most recent attenuation relationships and a review of potential seismotectonic sources, Golder determined that the design PGA for the site is 0.26g for the MCE. The PGA associated with an earthquake with a probability of exceedance of 10 percent in a 250-year period for the site (per Subtitle D) was estimated to be approximately 0.25g by Algermissen (1990)[7]. Using the 2008 USGS Deaggregation Program, the PGA associated with an earthquake with a probability of exceedance of 10 percent in a 250-year period for the site is estimated to be is approximately 0.20g. Therefore, the Discharger's consultant concluded that the ground accelerations associated with an MCE event as required by Title 27 CCR result in more stringent design criteria than that required by Subtitle D.

33. The Facility receives an average of 25 inches of precipitation per year as measured at the Beale Air Force Base. The majority of the rainfall occurs between November and April. During the period between 1950 and 1997, a maximum annual precipitation of 46.3 inches was recorded in Marysville in 1983.

34. The 1000-year, 24-hour precipitation event is 8.12 inches, based on National Oceanic and Atmospheric Administration (NOAA), 2016, Point Precipitation Frequency Estimates. Pan evaporation data from Marysville between 1949 and 1953 averaged 55.6 inches annually with an average minimum of 0.96 inches in December and an average maximum of 10.2 inches in July.

35. The Facility is generally located adjacent to the 100-year flood plain (see Attachment D) based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Yuba County, Panel 400, dated 17 May 1982. Following the heavy storms in January 1997, high water marks adjacent to the landfill were staked. These elevations were approximately two feet higher than those indicated on the old FEMA map. Due to relatively limited hydrologic information for the general area, the recurrence time associated with the January 1997 storm is not known. As a result, the Discharger commenced a flood hazard study for the site. The results of the study concluded that the

[7] Algermissen, 1990, "Probabilistic Earthquake and Velocity Maps for the Continental United State and Puerto Rico," U.S. Geological Survey Miscellaneous Field Studies Map MF-2120.

Discharger should maintain a minimum two-foot freeboard above the January 1997 high water elevations to ensure adequate flood protection from extreme flood events. To meet the recommended design elevation, two small segments of the southern perimeter road were raised by approximately one to three feet, and interim flood control measures were implemented by the end of 1997. The Discharger has reported that the minor perimeter improvements will have no significant impact on restricting the base flood flow or reducing the temporary water storage.

36. The lands immediately surrounding the Facility primarily consist of active cattle grazing. Designated land uses surrounding the Facility include *Public* to the north (Beale Air Force Base) and *Potential Landfill and Landfill Buffer Area*, and *Exclusive Agriculture* to the west, south and east. The nearest residence is located more than 2,000 feet west of the permitted landfill. Other residences areas along Jasper Lane are more than 5,000 feet southwest of the landfill. The postclosure end use of the site will be consistent with surrounding terrain, land uses, and zoning. The site will be maintained as non-irrigated open space.

37. Groundwater use in the site vicinity is primarily for agricultural purposes with some use for domestic water supply. Attachment C shows groundwater wells located within one mile of the site. Groundwater usage has been declining since 1983 as surface water sources are developed resulting in a regional rebound in groundwater levels. The Discharger has identified sixteen domestic and two agricultural water supply wells within one mile of the site.

38. Surface water drainage from the site is primarily to the south towards Best Slough, which borders the southern end of the landfill property. A small portion of the northwestern part of the site drains to Hutchinson Creek, which flows northward through Beale AFB. Best Slough is a natural overflow channel of Dry Creek, and begins approximately three miles upstream from the landfill site. Best Slough runs along the southern boundary of the site and discharges into the Feather River approximately 10 miles to the west. The 100-year flood flows for Best Slough have been estimated to be around 7,900 cubic feet per second. Storm water sedimentation basins are located east and west of the landfill as shown on Attachment E. The sedimentation basins detain storm water for sedimentation control during the rainy season and are normally dry during the summer months. The east sedimentation basin is pumped to a perimeter conveyance ditch that discharges to the west sedimentation basin where it can drain at times to Best Slough. Best Slough eventually flows into the Sacramento River via the Feather River.

SURFACE WATER AND GROUNDWATER CONDITIONS

39. The *Water Quality Control Plan for Sacramento and San Joaquin River Basins, Fourth Edition* (Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.

40. The designated beneficial uses of Sacramento River, as specified in the Basin Plan, are municipal and domestic supply (MUN), agricultural irrigation supply and stock watering (AGR), hydroelectric power generation (POW), recreation (REC-1), freshwater habitat (COLD), fish migration and spawning (SPWN), wildlife habitat (WILD), ground water recharge (GWR), fresh water replenishment (FRSH), preservation of rare and endangered species (RARE), and esthetic enjoyment (REC-2).

41. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are domestic and municipal supply (MUN), agricultural supply (AGR), and industrial supply (IND), and industrial process supply (PRO).

42. The first encountered groundwater in the continuous water bearing zone (Regional Zone) is approximately 42 to 90 feet below ground surface (bgs). Groundwater elevations currently range from approximately 80 feet above mean sea level (MSL) to 100 feet MSL. Groundwater is generally unconfined, although some localized confinement can occur. Historical groundwater data from 1913 indicates that prior to agricultural development, groundwater was encountered approximately 20 to 30 feet bgs. Following the extensive development of irrigation in the late 1940's, overdraft of groundwater supplies caused groundwater levels in the area to decline greatly. In 1983, surface water was introduced as a source for irrigation and groundwater levels have subsequently increased.

43. Regional Zone groundwater flow is generally toward the west with a groundwater gradient in the active area of the landfill of approximately 0.007 (32 feet per mile). Perched shallow groundwater (Shallow Zone) occurs in areas. Recharge is believed to occur from Best Slough and the other areas surrounding the site.

44. In a October 2008 Construction Quality Assurance (CQA) Final Report for WMU 1 Cell 3, and Cell 2, Phase 4 Liner System the Discharger's consultant, Golder Associates stated that "*portions of the native excavation slopes and floor contained coarse gravels within clay soils (CL) exposed in the subgrade surface*." Furthermore, the consultant stated that "*consistent with past liner construction projects at the NWSORL (Facility), localized wet zones were encountered. One area occurred above the sump on the north side slope (measured approximately 10 feet wide by 10 feet long). A second area occurred on the floor of Cell 3, Phase 1 (measured approximately 4 feet wide by 10 feet long).*"

45. Shallow perched groundwater has been observed at the Facility. Title 27 section 20415 subdivision (b)(1)(B)(3-5) states that for a groundwater detection monitoring program (DMP) that besides monitoring the uppermost aquifer (Regional Zone) the Discharger shall have:

    a. a sufficient number of Monitoring Points and Background Monitoring Points installed at appropriate locations and depths to yield ground water samples from portions of the zone of saturation, including other aquifers, not monitored pursuant to ¶(b)(1)(B)1. and ¶(b)(1)(B)2., to provide the best assurance of the earliest possible detection of a release from the Unit;

    b. a sufficient number of Monitoring Points and Background Monitoring Points installed at appropriate locations and depths to yield ground water samples from zones of perched water to provide the best assurance of the earliest possible detection of a release from the Unit; and

    c. Monitoring Point locations and depths that include the zone(s) of highest hydraulic conductivity in each ground water body monitored pursuant to this subsection [i.e., under ¶(b), inclusive].

46. Based on Title 27 requirements for detection monitoring including other zones of saturation, other aquifers, zones of perched water, and zones of highest hydraulic

conductivity Central Valley Water Board staff issued a Notice of Violation (NOV) dated 7 January 2016 requiring the Discharger to monitor the upper portion of the Regional Zone that exists at the Facility. As a result, in August 2016 the Discharger installed eleven additional groundwater monitoring wells to monitor the upper portion of the Regional Zone along the north, west, and southern edges of the extent of waste in WMU 1. These additional groundwater monitoring wells include three wells (MW-2S, MW-5S, MW-7S) along the northern boundary of WMU 1, seven temporary wells (MW-8S, MW-6S, T-4, MW-4S, T-2S, T-3, and T-1S) along the western boundary of Cell 1, and one well (MW-16S) along the southern boundary of Cell1 (see Attachment G).

47. Monitoring data from 2005 to 2016 in background monitoring well MW-1 indicate the uppermost aquifer (Regional Zone) background groundwater quality has total dissolved solids (TDS) ranging between 42 and 210 milligrams per liter (mg/L).

LEACHATE MONITORING

48. The Discharger performs leachate monitoring to characterize waste in accordance with Title 27 section 20200, subdivision (c). The results of the Discharger's leachate monitoring are shown in the table below:

WMU 1 Leachate Sumps Monitoring Results, 2005-2016 (Note: Leachate results not reported in 2012), (Source: Geotracker)									
Parameter Name	**# Detects**	**% Detects**	**Units**	**Min**	**Max**	**Average**	**Std Dev**	**WQO**	**WQO Limit**
Calcium	57	100%	mg/L	26	320	206	61	-	-
Chloride	57	100%	mg/L	22	1,900	**900**	525	**250**	CA 2nd MCL
Potassium	57	100%	mg/L	1	220	65	54	-	-
Magnesium	57	100%	mg/L	14	500	208	100	-	-
Sodium	57	100%	mg/L	18	950	**419**	267	**30**	Taste and Odor
Total Dissolved Solids	57	100%	mg/L	130	6,700	**3,185**	1,534	**500**	CA 2nd MCL
Bicarbonate Alkalinity as CACO3	54	95%	mg/L	77	3,500	1,399	691	-	-
Nitrogen, Nitrate-Nitrite	45	79%	mg/L	0.011	**13**	0.679	2	**10**	CA 1st MCL
Sulfate	44	77%	mg/L	0.820	**650**	42	105	**250**	CA 2nd MCL
Total Organic Carbon (TOC)	16	28%	mg/L	15	4,500	638	1,096	-	-
1,4-Dichlorobenzene	57	100%	ug/L	0.3	27	**12**	7	**5**	CA 1st MCL
Ethylbenzene	57	100%	ug/L	0.5	**87**	27	19	**29**	Taste and Odor
Toluene	56	98%	ug/L	0.3	**550**	45	91	**150**	CA 1st MCL
Methyl-tert-butyl ether (MTBE)	56	98%	ug/L	0.6	190	**20**	37	**13**	CA 1st MCL
Xylenes	56	98%	ug/L	3	170	**62**	41	**17**	Taste and Odor
Benzene	55	96%	ug/L	0.6	28	**11**	8	**1**	CA 1st MCL
1,3,5-Trimethylbenzene	54	95%	ug/L	0.2	6	2	1	15	Taste and Odor
Acetone	52	91%	ug/L	9	**36,000**	3,226	7,371	**20,000**	Taste and Odor
n-Propylbenzene	52	91%	ug/L	0.1	3	1	0.8	260	CA Notification Level
1,2,4-Trimethylbenzene	52	91%	ug/L	0.5	17	7	5	330	CA Notification Level
Naphthalene	51	89%	ug/L	2	**36**	9	8	**21**	Taste and Odor
tert-Butyl alcohol (TBA)	51	89%	ug/L	110	7,500	**1,760**	1,624	**1200**	CA Notification Level
Vinyl chloride	49	86%	ug/L	0.2	15	**4**	3	**0.5**	CA 1st MCL
1,1-Dichloroethane	45	79%	ug/L	0.1	**25**	2	4	**5**	CA 1st MCL
1,2-Dichloroethane	45	79%	ug/L	0.2	56	**7**	11	**0.5**	CA 1st MCL
Chlorobenzene	41	72%	ug/L	0.3	2	1	0.5	50	Taste and Odor
cis-1,2-Dichloroethene	40	70%	ug/L	0.2	**15**	2	3	**6**	CA 1st MCL
2-Butanone	37	65%	ug/L	3	**38,000**	5,187	9,056	**8400**	Taste and Odor
Chloroethane	32	56%	ug/L	0.3	**16**	2	3	**16**	Taste and Odor
1,2-Dichlorobenzene	32	56%	ug/L	0.1	0.8	0.3	0.2	24	Taste and Odor
1,2-Dichloropropane	28	49%	ug/L	0.1	3	1	0.8	5	CA 1st MCL
tert-Amyl methyl ether (TAME)	27	47%	ug/L	0.3	8	1	2	-	-
Trichloroethene (TCE)	27	47%	ug/L	0.1	2	0.6	0.5	5	CA 1st MCL
4-Methyl-2-pentanone (MIBK)	26	46%	ug/L	2	**580**	100	140	**120**	CA Notification Level
Dichlorodifluoromethane	24	42%	ug/L	0.1	4	0.6	0.7	-	-
Di-isopropyl ether (DIPE)	23	40%	ug/L	0.4	19	**3**	4	**0.8**	Taste and Odor
Ethyl tert-butyl ether (ETBE)	22	39%	ug/L	0.4	4	1	0.8	-	-
n-Butylbenzene	21	37%	ug/L	0.1	2	0.4	0.4	260	CA Notification Level
trans-1,2-Dichloroethene	21	37%	ug/L	0.1	0.9	0.3	0.2	10	CA 1st MCL
Carbon disulfide	19	33%	ug/L	0.4	12	**2**	3	**0.39**	Taste and Odor
Methylene chloride	19	33%	ug/L	0.2	**5**	1	0.9	**5**	CA 1st MCL
1,4-Dioxane	18	32%	ug/L	45	510	**142**	122	**1**	CA Notification Level
Tetrachloroethene (PCE)	18	32%	ug/L	0.1	2	0.6	0.6	5	CA 1st MCL
Ethanol (EtOH)	17	30%	ug/L	1,200	690,000	136,047	205,222	760,000	Taste and Odor
Styrene	17	30%	ug/L	0.3	3	1	0.7	10	CA 2nd MCL
Note: Monitoring results in bold exceed the WQO limit (bold).									

Leachate monitoring confirms that waste and waste constituents of concern (COCs) must be contained within the WMU in order to protect receiving water quality.

49. The Discharger is required in accordance with Title 27 section 20340, subdivision (h) to quantify on a monthly basis the amount of leachate collected. Below are monthly leachate collection and removal totals reported by the Discharger:

Quantity of Leachate Removed from LCRS Sumps (x 1000 gallons)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Annual Totals**
2010[1]	201	179	143	129	118	93	51	60	50	68	66	210	**1,367**
2011[1]	182	180	321	296	153	89	89	46	58	86	61	79	**1,641**
2012[1]	105	90	202	280	204	87	126	156	109	101	95	373	**1,929**
2013	402	186	162	120	132	180	108	78	72	48	72	96	**1,656**

Quantity of Leachate Removed from LCRS Sumps (x 1000 gallons)													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Annual Totals**
2014	96	165	210	180	113	82	114	90	83	28	96	700	**1,955**
2015	296	215	165	126	93	99	84	89	44	66	105	94	**1,473**
2016	381	240	570	258	138	96	90	108	60	120	132	360	**2,553**
2017	946	876	618	444	223	228	-	-	-	-	-	-	**3,334**
Monthly Totals[2]	**1,662**	**1,254**	**1,772**	**1,389**	**950**	**726**	**662**	**627**	**476**	**517**	**626**	**1,911**	

[1] Monthly quantities include leachate removed from LCRS Sumps 1-A and 2-A and recirculated back into WMUs.

[2] Monthly totals do not include 2017 leachate quantities.

On 30 January 2017, the Discharger notified Central Valley Water Board staff that it was in violation of WDRs Order R5-2009-0020 due to heavy rainfall. The Discharger was unable to comply with Title 27 requirements to maintain less than one-foot of hydraulic head on the primary containment liner. The Discharger stated in its 2017 1st Semiannual Monitoring Report that "*the short term, six day increase in leachate levels caused temporary shortage of storage tank capacity at the site*". Currently the Discharger removes leachate and transfers it to temporary storage tanks and periodically either returns the leachate to the WMU for dust control or disposes of the leachate by transporting it to a wastewater treatment plant. These revised WDRs in section H, Provisions, require the Discharger to submit a Water Balance Analysis Report that determines the amount of storage capacity on site necessary to contain leachate at the beginning of the wet season and prevent excessive head on the primary liner per the specifications in these WDRs. Containment capacity must consider amongst other things, leachate production from a 100-year wet season including storage capacity for the 1000-year design storm, and maintain the necessary freeboard to operate safely above ground storage tanks or maintain a minimum 2-feet of freeboard including storage capacity for the design storm in any Class II surface impoundment.

GROUNDWATER MONITORING

50. Groundwater exists at the site in two zones: (1) a deeper regional groundwater zone (Regional Zone, see Attachment F) which exists year around and lies below the entire site at about 42 to 90 bgs, and (2) a shallow perched zone (Shallow Zone, see Attachment G) which exists throughout the landfill much of the year at about 10 feet to greater than 20 feet bgs.

51. In 1981, prior to landfill development, five groundwater monitoring wells (1, 4, 7, 10, and 12) monitored groundwater beneath the Recology Ostrom Road site. In June 1993, EMCON abandoned wells 4, 7, and 10 and installed four groundwater monitoring wells (MW-1, MW-2, MW-3, and MW-4). Monitoring well MW- 5 was installed on June 1, 1995 as an additional downgradient monitoring well adjacent to Cell 1. MW-6 was installed in 1999. Additional monitoring wells were installed in 2001 (MW-7, MW-8) and 2003 (MW-16, T-1, and T-2) as the facility was developed. The current regional groundwater monitoring network (Regional Zone) consists of one background well (MW-1) and ten downgradient wells (MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-16, T-1, and T-2) as shown on Attachment F. These wells were installed to monitor the uppermost aquifer to allow for earliest detection of a release.

52. Shallow piezometers have been installed at the Facility to monitor a shallow coarse-grained unit in the unsaturated zone, which seasonally contains perched water (Shallow Zone). Piezometers PZ-11 and PZ-12 were installed in 2001; PZ-13 was installed in 2002. These piezometers, located among the northern boundary of Cells 1 and 2, are checked for water quarterly. If water is detected, a sample is collected and analyzed in accordance with the MRP.

53. Detection monitoring occurs semiannually. In 2009, trace concentrations of volatile organic compounds (VOCs) were detected in samples from groundwater wells T-2 and MW-4. In 2013, samples from groundwater well MW-6 contained intermittent single trace VOC detections. The inorganic groundwater chemistry and detected VOCs in these wells were indicative of landfill gas effects. On 20 June 2013, the Discharger submitted an Engineering Feasibility Study and Corrective Action Program for Southern Boundary of Cell 3B due detection of VOCs and elevated concentrations of bicarbonate alkalinity and total dissolved solids (TDS) in pan lysimeter PL-3B and leak detection sump LD-3B. Furthermore, monitoring wells T-2, MW-4, and MW-6, were placed into corrective action monitoring and are sampled quarterly. Corrective actions targeting more effective landfill gas controls to prevent lateral migration of landfill gas from the waste unit were implemented, and the wells were placed in a proposed corrective action monitoring program to assess the effectiveness of the corrective actions. Key corrective actions taken to improve landfill gas control (see Attachment H) have included 1) installation of additional gas extraction wells in the waste units as zones requiring additional gas extraction were identified, and as the facility has been developed, 2) installation of a perimeter landfill gas barrier and collection system along the western edge of WMU 1, Cell 1 and around the southwestern corner of Cell 1, and 2) continual system adjustments and retrofits to ensure sufficient gas system capacity (e.g. replace main header with a larger-diameter pipe, retrofit leachate sumps to allow stronger more consistent vacuum for gas extraction at the sumps). Recent monitoring results in 2016 have demonstrated that the number of VOC detections in wells MW-4 and T-2 has decreased.

54. However, on 6 January 2016, Central Valley Water Board staff issued a Notice of Violation (NOV) for continued detections of VOCs in monitoring wells T-2, MW-4, and MW-6. The NOV also required the Discharger to submit a work plan to monitor the groundwater within the upper portion of the Regional Zone that exists at the Facility. Eleven additional groundwater monitoring wells were installed in August 2016 to monitor the unconfined water table within the upper portion of the Regional Zone. These additional groundwater monitoring wells include three wells (MW-2S, MW-5S, MW-7S) along the northern boundary of WMU 1, seven wells (MW-8S, MW-6S, T-4, MW-4S, T-2S, T-3, and T-1S) along the western boundary of Cell 1, and one well (MW-16S) along the southern boundary of Cell 1 (see Attachment F). Wells designated with the prefix “PZ” and "VZW" were screened to monitor groundwater that exists most of the year within the Shallow Zone. Wells designated with the suffix "S" such as MW-_S and T-_S were screened to monitor the Regional Zone water table.

55. The purpose of installing and monitoring these wells in the upper portion of the Regional Zone and the Shallow Zone as part of the Discharger’s Detection Monitoring Program (DMP) is to have sufficient number of monitoring points in the Regional and Shallow Zone to detect a release from the landfill at the earliest possible time. Monitoring points are located in areas that are likely to detect a release. These include the Point of Compliance (downgradient) and sumps. Wells that are located in these areas are critical to

determining if a release has occurred to the Regional Zone and Shallow Zone and what the characteristics of the release are.

56. Multiple wells in the Discharger's DMP have recorded groundwater levels but have not produced groundwater samples. These include wells VZW-4, -5, VZW-T1 and VZW-T4. The newest well locations located approximately 500 to 600 feet west of the POC boundary also were constructed as dry wells. These include VZW-17, -18, and -19. Dry wells or wells that do not have enough groundwater in the well casing do not meet the intent of Title 27, section 20415 subdivision (a)(1)(B)(3-5) which states that other zones of saturation, other aquifers, zones of perched water, and zones of highest hydraulic conductivity shall be monitored. The cause of the wells becoming dry at certain times of the year may be that these wells may be installed in areas of the Shallow Zone where groundwater may exist seasonally due to perched conditions.

57. Therefore, at the time this Order was adopted, the Discharger's detection monitoring program (DMP) for groundwater at the landfill **may not satisfy** the requirements of Title 27 based on Finding above since it is unclear how groundwater in the Shallow Zone interacts hydraulically with the Regional Zone. This Order in Provisions H requires the Discharger to submit a work plan to update its site conceptual model to determine but not limited to (1) the vertical and lateral extent of groundwater in the Shallow Zone surrounding WMU; (2) identify all areas of highest hydraulic conductivity that should be monitored within the Shallow Zone; (3) the extent of the basal layer that exists between the Shallow Zone and the Regional Zone; (4) the permeability of the basal layer; (5) water sources that recharge the Shallow Zone; and (5) the period of time when perched groundwater exists in the Shallow Zone taking into account the amount of water coming from its sources i.e., timing and amount of precipitation received during the wet season1. The work plan shall provide an evaluation of all DMP wells and certify the DMP meets the intent of Title 27. The evaluation shall also include cross-sections defining the groundwater zone a particular well is monitoring.

58. Groundwater monitoring results below show that VOCs have been detected in groundwater and continue to be detected in groundwater monitoring wells T-2, MW-4, MW-6, and PZ-11. Furthermore, VOCs have been detected in the Shallow Zone groundwater monitoring well VZW-6 and the Regional Zone water table groundwater monitoring well T-2S recently in 2017.

	Number of VOC Detections per Year (Source: Geotracker database)											
	Year											
Groundwater Monitoring Point	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
T-1S	-	-	-	-	-	-	-	-	-	-	-	-
T-1	2	-	1	-	2	-	-	-	-	-	-	-
T-3	-	-	-	-	-	-	-	-	-	-	-	-
T-2S	-	-	-	-	-	-	-	-	-	-	-	**3**
T-2	**5**	**5**	**6**	**8**	**9**	**11**	**11**	**21**	**12**	**5**	**3**	**1**
MW-4	**3**	**4**	**2**	**-**	**4**	**11**	**11**	**12**	**11**	**9**	**7**	**6**

Groundwater Monitoring Point	Number of VOC Detections per Year (Source: Geotracker database)											
	Year											
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MW-4S	-	-	-	-	-	-	-	-	-	-	-	-
T-4	-	-	-	-	-	-	-	-	-	-	-	**4**
MW-6	**5**	**-**	**2**	**-**	**2**	**1**	**-**	**1**	**2**	**3**	**4**	**1**
MW-6S	-	-	-	-	-	-	-	-	-	-	-	-
VZW-6	-	-	-	-	-	-	-	-	-	-	-	**3**
MW-8	4	4	-	-	2	-	-	1	-	-	-	-
MW-5	3	2	3	-	2	-	-	-	-	-	-	-
MW-5S	-	-	-	-	-	-	-	-	-	-	-	-
PZ-13	-	2	-	-	-	-	-	-	-	-	-	-
MW-7	5	-	2	-	-	-	-	-	-	-	-	-
MW-7S	-	-	-	-	-	-	-	-	-	-	-	-
PZ-11	**32**	**-**	**31**	**23**	**20**	**20**	**14**	**14**	**9**	**3**	**5**	**3**
MW-2	2	-	-	-	1	-	-	-	-	-	-	-
MW-1 (background)	4	-	-	-	1	-	-	-	-	-	-	-
VZW-1 (background)	-	-	-	-	-	-	-	-	-	-	-	-
MW-3	-	2	-	-	-	1	1	-	-	-	-	-
MW-16	2	1	-	-	2	-	-	-	-	-	-	-
MW-16S	-	-	-	-	-	-	-	-	-	-	-	-

59. These revised WDRs in Provisions H and in R5-2018-0007 require the Discharger to prepare a workplan to assess the effectiveness of current corrective action for a release of VOCs to groundwater and propose additional measures if necessary to address the release of VOCs from the WMU to groundwater.

SURFACE WATER MONITORING

60. The landfill lies within the watershed of the Best Slough, which borders the southern portion of the site. Best Slough is formed by an intermittent stream that meanders over a broad alluvial channel. Its headwaters are found 3 miles north of the site where Dry Creek passes through Beale Air Force Base. When flows in Dry Creek are sufficiently large, there is an overflow into Best Slough. The landfill is located on a gentle south facing slope.

61. Surface drainage from the landfill generally follows topography and flows to the south toward Best Slough. No prominent drainages are developed within the site, and surface water flows across the site predominantly as sheet flow. Surface water is sampled where it begins to flow past the waste management facility within Best Slough at monitoring point SW-1 (background), and downstream of the site at monitoring point SW-3 within Best

Slough. Monitoring point SW-1 monitors surface water at a point where it flows adjacent to the landfill site within Best Slough (upstream), and monitoring point SW-3 monitors surface water at the furthest downstream point on the site within Best Slough. The surface water monitoring locations are sampled during the first storm of the rainy season that produces significant flow to require discharge from the sedimentation basins, consistent with the monitoring and reporting program of the WDRs.

62. At the time this Order was adopted, the Discharger's surface water detection monitoring program (DMP) **did not satisfy** the requirements of Title 27, section 20415, subdivision (c). Section A.13 through A.15 (Prohibitions) of the prior WDRs Order No. R5-2009-0020 prohibited the discharge of liquid waste or leachate to surface waters. Currently, the Discharger does not monitor water quality at its sedimentation basins. Section H (Provisions) of these WDRs requires the Discharger to submit a work plan to monitor background surface water quality if available as well as surface water quality entering, leaving, and within sedimentation basins. Section A.6 of this Order (Prohibitions) continues to prohibit the discharge of liquid waste or leachate to surface waters. These revised WDRs also require the Discharger to update its Water Quality Protection Standards (WQPS) and Sampling and Analysis Plan (SAP) to include the additional surface water monitoring points.

63. In 2017 the Discharger has monitored groundwater elevations in recently installed groundwater monitoring wells in the Shallow Zone at the Facility. Attachment K shows Shallow and Regional Zone groundwater elevation contour maps for March and June 2017 monitoring events. Attachment E shows the location of the Discharger's two storm water sedimentation basins. Unlined stormwater retention ponds located in close proximity to a WMU are capable of changing the underlying local hydrogeology characteristics at a landfill due to artificial recharge. Artificially changing the hydrogeology at a facility can interfere with the Discharger's ability to obtain representative samples of groundwater quality due to dilution. Dilution can prevent the Discharger's detection monitoring system from providing earliest detection of a release from a WMU. Furthermore, storm water in the sedimentation basins may be contributing to groundwater elevations in the Shallow Zone (perched groundwater) which is currently causing the Discharger to violate its groundwater separation requirements along the side slopes and potentially at LCRS sumps. These revised WDRs in Provisions H require the Discharger to investigate whether stormwater collection, conveyance, and storage at and around the facility is inhibiting the Discharger from collecting representative unsaturated zone and groundwater samples for water quality detection monitoring programs and/or causing the Discharger to violate the Facility's groundwater separation requirements.

UNSATURATED ZONE MONITORING

64. The unsaturated zone monitoring network currently includes background vacuum lysimeter VZ-1 and downgradient vacuum lysimeter VZ-2. Pan lysimeters were constructed beneath the sumps of WMU 1, Cells 1 (PL-1A, PL-1B), Cells 2 (PL-2A, PL-2B), and Cells 3 (PL-3A, PL-3B). These monitoring points are shown on Attachment F. The pan lysimeters are constructed beneath the sumps, as these locations are the primary collection points where fluids will accumulate. In the current detection monitoring program, water samples are collected from the pan lysimeters semiannually when sufficient fluid is present, and the samples are analyzed for the parameters contained in the MRP associated with WDR Order No. R5-2009-0020.

65. Gas samples also are collected quarterly from the pan lysimeters for the gas constituents required by the MRP. Future cells will be constructed with similar pan lysimeter monitoring devices beneath the sumps. The unsaturated monitoring systems will be designed by a Registered Geologist or Registered Civil Engineer. At the time this Order was adopted, the Discharger's DMP for unsaturated zone monitoring of soil-pore liquid and soil-pore gas at the landfill **satisfies** the requirements contained in Title 27.

66. Unsaturated zone monitoring results below show that VOCs have been detected in the unsaturated zone beneath WMU 1 and continue to be detected in unsaturated zone monitoring points PL-1B and PL-3A. Furthermore, VOCs have been detected in unsaturated zone monitoring points PL-1B and PL-3B recently in 2016.

Unsaturated Zone Monitoring Point	**Number of VOC Detections per Year (Source: Geotracker database)**											
	Year											
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
VZ-1 (background)	2	1	2	-	-	-	-	-	-	-	-	-
VZ-2	9	4	1	-	2	1	-	-	3	-	-	-
PL-1A	43	46	74	15	2	5	3	-	6	-	-	-
PL-1B	**-**	**66**	**61**	**17**	**4**	**18**	**21**	**3**	**12**	**12**	**5**	**1**
PL-2A	62	33	5	-	-	-	-	-	-	-	-	**1**
PL-2B	7	3	6	-	2	-	1	-	-	13	-	-
PL-3A	**-**	**-**	**-**	**-**	**-**	**-**	**51**	**16**	**15**	**28**	**3**	**12**
PL-3B	-	-	-	-	-	-	-	20	13	-	-	**4**

67. These revised WDRs in Provisions H and in MRP R5-2018-0007 require the Discharger to perform corrective action for a release of COCs to the unsaturated zone.

68. Unsaturated zone monitoring results below show that VOCs have been detected in the leak detection system below WMU 1 and continue to be detected in leak detection system monitoring point LD-3A. Furthermore, VOCs have been detected in leak detection system monitoring point LD-3B recently in 2016.

Leak Detection Monitoring Point	Number of VOC Detections per Year (Source: Geotracker database)											
	Year											
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
LD-1B	-	-	-	-	-	-	-	-	-	-	-	-
LD-2B	-	-	-	-	-	-	-	-	-	-	-	-
LD-3A	-	-	-	-	-	-	4	11	-	2	-	**5**
LD-3B	-	-	-	-	-	-	-	-	13	-	-	**3**

69. These revised WDRs in Provisions H and in R5-2018-0007 require the Discharger to perform corrective action for a release of COCs into the leak detection system.

GROUNDWATER DEGRADATION, NON-COMPLIANCE, AND CORRECTIVE ACTION

70. On 20 June 2013, the Discharger submitted an *Engineering Feasibility Study and Corrective Action Program for Southern Boundary of Cell 3B* due detection of VOCs and elevated concentrations of bicarbonate alkalinity and total dissolved solids (TDS) in pan lysimeter PL-3B and leak detection sump LD-3B which is a violation of the Discharger's water quality protection standards (concentration limits). The Discharger attributed the release to landfill gas. As corrective action the Discharger proposed improving its Gas Collection and Control System (GCCS). The Discharger made several improvements (see Attachment H) including: 1) installation of additional gas extraction wells in the waste units as zones requiring additional gas extraction were identified, and as the facility has been developed; 2) installation of a perimeter landfill gas barrier and collection system along the western edge of WMU 1, cell 1 and around the southwestern corner of cell 1; and 3) continual system adjustments and retrofits to ensure sufficient gas system capacity (e.g. replace main header with a larger-diameter pipe, retrofit leachate sumps to allow stronger more consistent vacuum for gas extraction at the sumps).

71. Corrective action measures for the releases of VOCs, which is a violation of the Discharger's WQPS, from Landfill cells 1A and 2A consist of implementation of landfill gas control measures described in Finding 71 above and an automated leachate extraction system in Sumps 1A and 2A. Operation of the landfill gas control system commenced on 30 October 2002. Automated pumping systems have also been installed in both cells 1A and 2A leachate sumps. Pressure transducers have been installed in underlying Pan Lysimeters PL-1A and PL-2A allowing for automated measurements of liquid levels above the base of the pan lysimeters. A Corrective Action Assessment Report, which presented an assessment of the interim corrective action measures was submitted on 24 May 2004. Improvements to the landfill gas control system have been made to increase the system's collection capacity. A total of fifty-five extraction wells (EW-1 through EW-55), fourteen perimeter extraction wells (PEW-1 to PEW-14), and the six LCRS risers (Sumps 1A, 1B, 2A, 2B, 3A, and 3B) have been installed and tied into the LFG extraction system. The

Discharger intends to continue to expand the gas control system as the site is developed. Water monitoring results collected in 2017 indicate that operation of the existing LFG control system has reduced the overall number and concentration of VOCs detected in shallow groundwater, the unsaturated zone, and has resulted in a reduction in some of the VOCs in the leachate.

72. The PEWs, located along the northern and western edges of Cell 1 were installed in 2012 to address the gas migration. In 2013, the installation of a perimeter landfill gas barrier and collection system began along the western edge of Cell 1. In phase 1 of this project, an additional geomembrane flap was welded to the existing HDPE geomembrane and collection piping was installed to limit potential for lateral migration of landfill gas along a southern section of the boundary. This perimeter barrier work was conducted in phases, with subsequent sections constructed in 2014 (northern section of western edge, Cell 1), and 2015 (the final middle section of the western boundary and an extension around the southwestern corner of Cell 1B). In 2017, the fourth phase of the perimeter barrier system was completed on the Northern boundary to Cell 3 (cell C was completed with the perimeter barrier as part of the original design). The remaining section of the southern perimeter will be completed in the future. These revised WDRs specify that the Discharger shall continue to install the perimeter barrier system at future cells to prevent lateral gas migration.

73. Monitoring of the PEWs was not required by WDR/MRP Order R5-2009-0020. The Discharger has stated that methane monitoring results collected from the PEWs during the second half of 2016 demonstrate that the barrier is continuing to be effective. Methane results along the western boundary of Cell 1 (PEW-3 through PEW-14) were low to non-detect in 2017. Monitoring and reporting of the PEW system is required under these revised WDRs/MRP in order to evaluate the effectiveness of the perimeter barrier system with respect to landfill gas control.

74. In May 2014, the condensate collection systems at leachate sumps 1B, 2B, 3A, and 3B were retrofitted. Active landfill gas extraction is now occurring at these sumps, and the modifications made to the condensate collection system have allowed for a stronger and more consistent vacuum for gas extraction at these sumps, improving gas control in cells 1B, 2B, and 3 and therefore reducing gas migration. These revised WDRs require the Discharger to continue to extract landfill gas at the LCRS sumps and/or other access points to the LCRS as corrective action.

75. In the second half of 2014 ten additional gas extraction wells were installed in cells 2 and 3 and connected to the GCCS in November 2014. The addition of these wells to the GCCS helped to reduce landfill gas pressures, and prevent further gas migration into the monitoring locations beneath the cell 3 waste unit. These revised WDRs require the Discharger to continue to extract landfill gas at these wells and report the effectiveness of the gas extraction as a corrective action measure.

76. At the beginning of 2015, integrated operation of three gas control devices (two engines and the enclosed flare) allowed for increased gas extraction and migration control. By mid-2015, the average gas flow was approximately 30% higher than the flow rate measured at the end of 2014. The perimeter landfill gas barrier and collection system along the western edge of Cell 1 and around the southwestern corner of Cell 1B was completed in 2015. These revised WDRs require the Discharger to monitor and report the

amount and quality of the landfill gas sent to its Landfill Gas Control System to determine the effectiveness of the landfill gas extraction system as a corrective action measure.

77. As identified in Finding 61 groundwater monitoring results show that VOCs have been detected in groundwater and continue to be detected in groundwater monitoring wells T-2, MW-4, MW-6, and PZ-11. Furthermore, VOCs have been detected in the Shallow Zone groundwater monitoring wells T-2S and VZW-6 recently in 2016. As identified in Finding 69 unsaturated zone monitoring results show that VOCs have been detected in the unsaturated zone beneath WMU 1 and continue to be detected in unsaturated zone monitoring points PL-1B and PL-3A. Furthermore, VOCs have been detected in unsaturated zone monitoring points PL-1B and PL-3B recently in 2016. As identified in Finding 71 unsaturated zone monitoring results below show that VOCs have been detected in the leak detection system below WMU 1 and continue to be detected in leak detection system monitoring point LD-3A. Furthermore, VOCs have been detected in leak detection system monitoring point LD-3B recently in 2016.

78. Upon review of the Discharger's *2015 First Semiannual Monitoring Report (31 July 2015)*, on 7 January 2016, Central Valley Water Board staff issued a Notice of Violation (NOV) requiring the Discharger amongst other things: (1) address detections of VOCs in groundwater, (2) address a perched zone (Shallow Zone) or groundwater existing above the regional aquifer (Regional Zone), (3) address groundwater separation issues, and (4) address saturated screen intervals. The NOV required the Discharger to submit a work plan by 29 February 2016 that would address the identified violations.

79. On 29 February 2016 the Discharger submitted a work plan to expand the Discharger's existing monitoring program. Also, in the first half of 2016, the leachate pumping systems for the LCRS sumps were upgraded to ensure more efficient leachate extraction which in turn allows for continual gas extraction to occur at the leachate sumps since leachate levels are kept low enough to allow a vacuum to be applied to the unsaturated zone within the leachate sumps. The LCRS sumps were fitted with an automated system that actuates the pump whenever leachate is present and will continue to operate until leachate is removed. This improvement was intended to ensure that gas is being effectively removed from the leachate sumps, a key location for continual, effective extraction. On-going routine system and gas extraction well monitoring was conducted to ensure adjustments were continually made as needed to maintain an effective gas extraction system. These revised WDRs require the Discharger to continue to extract landfill gas at all LCRS sumps and/or other access points to the LCRS as corrective action.

80. Also, in response to the 7 January 2016 NOV and in accordance with the Discharger's 29 February 2016 work plan, the Discharger installed two new groundwater monitoring wells (T-3 and T-4), nine shallow companion wells (MW-2S, MW-4S, MW-5S, MW-6S, MW-7S, MW-8S, MW16S, T-1S, and T-2S), in the upper portion of the Regional Zone, and eleven targeted monitoring points (intended to target shallow coarse grained units) in the Shallow Zone (VZW-1, VZW-2, VZW-4, VZW-5, VZW-6, VZW-8, VZW-16, VZW-T1, VZW-T2, VZW-T3, and VZW-T4) were installed and incorporated into the monitoring and sampling program.

    a. Low levels of VOCs have recently been detected at the following wells:

i. T-2S - Chloroform (0.21 µg/L, trace), methyl t-butyl ether (0.24 µg/L, trace), and tetrachloroethene (0.26 µg/L, trace)

ii. T-4 - 1,1-dichloroethane (0.42 µg/L, trace) and methyl t-butyl ether (1.6 µg/L)

b. Low levels of VOCs have recently been detected at the following SGZ wells:

i. PZ-11 – Chloroform (0.18 µg/L, trace), methyl t-butyl ether (0.93 µg/L), and tetrachloroethene (0.21 µg/L, trace)

ii. PZ-12 - methyl t-butyl ether(0.3 µg/L, trace) and tetrachloroethene (0.29 µg/L, trace)

iii. VZW-4 - Chloroform (0.37 µg/L, trace)

iv. VZW-6 - Chloroform (1.9 µg/L) and bromodichloromethane (0.16 µg/L, trace)

v. VZW-T4 Chloroform (1.1 µg/L), bromodichloromethane (0.17 µg/L, trace) and

vi. carbon disulfide (0.61 µg/L, trace)

The Discharger has stated that bromodichloromethane, carbon disulfide, and chloroform can all be naturally occurring VOCs that can be derived in a swampy environment that exists along the Best Slough area. Further monitoring and analysis is required to confirm the source of these COCs.

81. Upon review of the Discharger's *2016 Second Half and Annual Monitoring Report*, on 3 April 2017, Central Valley Water Board staff issued a Notice of Violation (NOV) requiring the Discharger amongst other things: (1) address detections of VOCs in groundwater, (2) address liquids in pan lysimeters, (3) address groundwater separation issues, and (4) develop water quality protection standards for Regional and Shallow Zones of groundwater. The NOV amongst other things required the Discharger to submit a work plan by 15 April 2017 that would delineate the vertical and lateral extent of a release west of groundwater monitoring wells MW-4S, MW-6S, T-2S, and T-4.

82. On 14 April 2017, the Discharger submitted a work plan to amend the 29 February 2016 work plan to expand the Discharger's existing monitoring program. As a result in 2017, four new groundwater monitoring wells (MW-17, MW-18, MW-19, and MW-20 in the Regional Zone, and four monitoring wells in the Shallow Zone (VZW-17, VZW-18, VZW-19, and VZW-20) were installed approximately 400 feet downgradient of Cell 1 to determine the extent of impact in the Regional Zone and Shallow Zone. In the September 2017 sampling event, no VOCs were detected at the MW-17, MW-18, MW-19, MW-20, and VZW-20 locations. Shallow Zone wells VZW-17, VZW-18, and VZW-19 were dry. The Discharger provided preliminary information showing that the extent of landfill gas impact extends no further than 400 feet downgradient from the landfill. These revised WDRs in Provisions H require the Discharger to submit a Technical Report including a work plan describing how the Discharger shall enhance its current corrective action program for elimination of the landfill gas related release of VOCs to groundwater and the unsaturated zone at their respective points of compliance.

83. Upon review of the Discharger's *2017 First Semiannual Monitoring Report*, on 7 September 2017, Central Valley Water Board staff issued a Continued Notice of Violation (Continued NOV) requiring the Discharger amongst other things: (1) address detections of VOCs in Shallow Zone groundwater, (2) address continued VOC and inorganic

exceedances in Regional Zone groundwater, liquids in pan lysimeters, (3) address the Discharger's inability to maintain 1-foot head on the primary liner in WMU 1, (4) address continued VOCs in the unsaturated zone, (5) address continued groundwater separation issues, and (4) develop water quality protection standards for Regional and Shallow Zones of groundwater. These revised WDRs in Provisions section H require the Discharger to:

a. Prepare a work plan to maintain a 2.5 feet separation between groundwater including capillary fringe and waste at all times as approved by the engineered alternative to 5-foot separation requirements in Title 27;

b. Prepare a work plan to assess its current corrective action program to eliminate the release of landfill gas related VOCs beyond the groundwater and unsaturated zone points of compliance. The revised Monitoring and Reporting Program (MRP) Order R5-2018-0007 includes accelerated monitoring frequency for monitoring points used to determine the effectiveness of the Discharger's corrective action program;

c. Submit a water balance analysis report and ensure that in accordance with the approved report the Discharger has adequate leachate and gas condensate storage capacity prior to the onset of the upcoming wet season;

d. Prepare a work plan to assess if the Discharger's Shallow and Regional Zone groundwater detection monitoring system complies with Title 27 requirements i.e. inhibited from providing representative samples due to artificial recharge from stormwater sedimentation basins, screened at appropriate depths to provide groundwater samples, etc.; and

e. Update its water quality protection standards to include all additional Shallow Zone and Regional Zone groundwater and unsaturated zone monitoring points, and additional surface water monitoring points used to determine compliance, and determine appropriate concentration limits for each monitored medium for providing earliest detection of a release.

84. The Monitoring and Reporting Program describes the corrective action monitoring that is required to demonstrate the effectiveness of the corrective action measures per Title 27 CCR, section 20430, as well as concurrent detection monitoring to provide the best assurance of the detection of potential subsequent releases per Title 27 CCR, section 20385 subdivision (c) and section 20420. The Discharger must demonstrate that the Facility complies with its Water Quality Protection Standard, including any applicable concentration limits greater than background, before the Facility can cease corrective action monitoring and return to Facility-wide detection monitoring.

WATER QUALITY PROTECTION STANDARDS

85. 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 most 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, subdivisions (e)(8), (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, subdivisions (b)(1)(B)2-4 However, Title 27 does not specify a specific method for non-statistical evaluation of monitoring data.

86. The Central Valley Water Board may specify a non-statistical data analysis method pursuant to Title 27, section 20080, subdivision (a)(1). Water Code section 13360, subdivision (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.

87. 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 applicable 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) [i.e., 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.

88. For a naturally occurring constituent of concern, 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, subdivision (e)(8); or

    b. By an alternate statistical method meeting the requirements of Title 27, section 20415, subdivision (e)(8)(E).

89. In accordance with WDR R5-2009-0020, a WQPS report was prepared in 2009, and an amendment was submitted in 2012 proposing statistical data analysis methods to calculate concentration limits for each monitored constituent in accordance with Title 27. The WQPS report proposed to use interwell data analysis to calculate tolerance limits (concentration limits) at 95 percent confidence and 95 percent coverage for the monitored constituents. Based on the number of monitoring points that have been added to the Discharger's monitoring network since adoption of WDR R5-2009-0020 and additional work that these WDRS may require the Discharger to do to its Detection Monitoring Program in order to comply with Title 27 requirements following the Discharger's evaluation of the Facility's site conceptual model, these WDRs require the Discharger to update its most recent water quality protection standards upon completion of the work in order to include additional Shallow and Regional Zone groundwater and unsaturated

zone monitoring points, additional surface water monitoring points, and determine appropriate concentration limits for each monitored medium.

LINER PERFORMANCE DEMONSTRATION

90. On 15 September 2000, the Central Valley Water Board adopted Resolution No. 5-00-213 *Request For The State Water Resources Control Board To Review The Adequacy Of The Prescriptive Design Requirements For Landfill Waste Containment Systems To Meet The Performance Standards Of Title 27*. The State Water Board responded, in part, that "*a single composite liner system continues to be an adequate minimum standard*" however, the Central Valley Water Board "*should require a more stringent design in a case where it determines that the minimum design will not provide adequate protection to a given body of groundwater*."

91. In a letter dated 17 April 2001, the Executive Officer notified owners and operators of solid waste landfills that "*the Board will require a demonstration that any proposed landfill liner system to be constructed after 1 January 2002 will comply with Title 27 performance standards. A thorough evaluation of site-specific factors and cost/benefit analysis of single, double, and triple composite liners will likely be necessary*."

92. On 1 October 2002, the Discharger submitted a *Liner Performance Demonstration Report Future Class II Liner Systems, Ostrom Road Landfill*. A full double composite liner system was proposed for future landfill cells at the landfill unless a site-specific demonstration is conducted which demonstrates that the prescriptive standard or another design complies with the Title 27 CCR performance standard.

93. As a result, in response to the Executive Officer's request for liner performance demonstrations in 2001 and due to the Central Valley Water Board staff's concerns over the use of single composite liner systems at sites with shallow groundwater conditions, the Discharger constructed the WMU 1 Cell 2, Phase 3 as a double-composite liner system along the landfill base in 2002-2003. The double composite liner system is comprised of two, single composite liner systems separated by a leak detection layer. Each single composite liner is comprised of the State's prescriptive standard composite liner system. A minimum single composite liner system is included for the side-slope. For future Class II landfill cells the proposed components for the containment system is a single composite liner with a leak detection system at the base and single composite liner system on the side slopes is shown below:

    a. The proposed containment system for the **floor (base)** of all future Class II landfill cells consists of the following components from top to bottom:

        i. Operations layer (12-inch minimum thickness);

        ii. 8-oz. geotextile filter layer;

        iii. LCRS gravel layer (12-inch minimum thickness);

        iv. Primary 60-mil HDPE geomembrane;

        v. 2.5-foot thick CCL with a permeability of 1 x 10-7 cm/s or less (the lower 6-inches is not subject to the permeability requirements);

vi. Leak detection geocomposite with heat bonded non-woven geotextile on both sides;

vii. Secondary 60-mil HDPE geomembrane liner; and

viii. Minimum 6-inch thick compacted subgrade comprised of soils classified as CL, CH, or SC per the Unified Soil Classification System (USCS)

b. The proposed containment system for the **side slope** areas of all future Class II landfill cells is as follows (from top to bottom):

i. Operations layer (12-inch minimum thickness);

ii. LCRS geocomposite drainage layer (geonet with 8-oz geotextile filter);

iii. 60-mil textured HDPE geomembrane; and

iv. Minimum 24-inches of low permeability compacted soil liner;

The Discharger stated that it would also provide comprehensive construction quality control during the liner system construction, complete an electrical leak location survey to verify the integrity of the primary liner system, and install LFG collection pipes within the LCRS to control LFG in the future, if necessary.

94. The liner demonstration report compared efficiencies and leakage potential of six different liner system designs. A total leakage potential of 0.8 gallons/acre/day was calculated throughout the life of the landfill (operations and 30-year post-closure period) based on a hypothetical 15-acre cell. In addition, a cost-benefit analysis was performed which showed that additional liner components would cost significantly more without significantly less leakage potential. As such, the demonstration concluded that a more stringent liner system is not warranted since the proposed system will meet the performance requirements of Title 27 CCR because it exemplifies the prescriptive standard with an additional leak detection component.

95. However, the proposed base and side slope containment system design did not account for groundwater that exists in the Shallow Zone most of the year along the side slopes of existing WMU 1 (Module 1) and shall presumably exist along the side slopes of future excavation necessary to construct WMU 2 (Module 2). The Discharger in a letter dated 1 November 2017 provided the following information to determine compliance with the highest anticipated groundwater separation requirement by establishing base of waste elevations in constructed WMU 1 cells. The base of waste elevation assumes that the lowest elevation of base of waste in a WMU is waste that exists at the bottom of the LCRS sump. For existing WMU cells, Central Valley Water Board staff accepted the bottom elevation of the LCRS sump as base of waste from where the Discharger must maintain highest anticipated groundwater separation. For determining compliance on the side slopes the distance between the elevation at which highest anticipated groundwater including capillary fringe exists (both Shallow and Regional Zones) and the shortest distance (radius) projected from that elevation towards the side slope LCRS is used.

AS-BUILT SUMP ELEVATION AND PAN LYSIMETER CONSTRUCTION SUMMARY				
Cell/ Sump	LCRS Sump Elev. (ft NAVD 88)	Pan Lysimeter Elev. (ft NAVD 88)	Sealed/ Unsealed	Comment
1A	97.3	96.0	Unsealed	Single composite liner; compacted clay between primary liner and pan liner
1B	92.4	89.8	Sealed	Pan sealed to secondary liner
2A	98.6	93.7	Unsealed	Single composite liner; compacted clay between primary liner and pan liner
2B	97.8	90.5	Unsealed	Full double composite liner; compacted clay between secondary liner and pan liner
3A	102.2	99.4	Sealed	Pan sealed to secondary liner
3B	101.8	99.0	Sealed	Pan sealed to secondary liner

96. On 8 November 2017, the Discharger provided recent Shallow Zone and Regional Zone groundwater monitoring information regarding groundwater elevations below and along the side slopes of WMU 1. The information was tabulated to determine where Shallow Zone and Regional Zone groundwater exists and the duration that groundwater exists in a condition where it exceeds the point of compliance (POC) for minimum groundwater separation of 2.5 feet as an engineered alternative. The table below shows the results of the recent groundwater monitoring:

Recent Groundwater Monitoring Results (Monitoring Period 2/10/2017 to 10/25/2017) (Elevations in NAVD88)									
Mon. Point (MP)	**Ground Water (GW) Zone**	**Point of Compliance (POC)**	**POC EL. (ft)**	**GW Max.[1] (ft)**	**GW Ave.[1] (ft)**	**Max. GW elevation[1] above POC (ft)**	**Max. Head[2] above POC (ft)**	**Period GW El. Exceeding POC**	**% Time GW Elevation Exceeding POC**
VZW-1	Shallow	JTD Figure 2-4 Base Elevation	**112**	116.89	110.05	4.89	2.39	2/10/2017-6/23/2017	52%
VZW-2	Shallow	LCRS Sump 3A	102.2	120.67	115.19	18.47	15.97	2/10/2017-10/25/2017	100%
VZW-5	Shallow	LCRS Sump 1A	97.3	105.11	104.01	7.81	5.31	2/10/2017-10/25/2017	100%
PZ-11	Shallow	LCRS Sump 2A	98.6	107.77	105.37	9.17	6.67	2/10/2017-10/25/2017	100%
PZ-12	Shallow	LCRS Sump 2A	98.6	104.12	102.44	5.52	3.02	2/10/2017-10/25/2017	100%
PZ-13	Shallow	LCRS Sump 1A	97.3	97.71	95.11	0.41	-	4/27/2017-6/2/2017	14%

Recent Groundwater Monitoring Results (Monitoring Period 2/10/2017 to 10/25/2017) (Elevations in NAVD88)									
Mon. Point (MP)	**Ground Water (GW) Zone**	**Point of Compliance (POC)**	**POC EL. (ft)**	**GW Max.[1] (ft)**	**GW Ave.[1] (ft)**	**Max. GW elevation[1] above POC (ft)**	**Max. Head[2] above POC (ft)**	**Period GW El. Exceeding POC**	**% Time GW Elevation Exceeding POC**
T-1	Regional	LCRS Sump 1B	92.4	97.07	92.56	4.67	2.17	3/14/2017-8/2/2017	62%
T1-S	Regional	LCRS Sump 1B	92.4	97.25	92.72	4.85	2.35	3/14/2017-8/2/2017	62%
VZW-16	Shallow	Average Elevation between LCRS Sumps 1B-2B	**95**	109.49	102.97	14.49	11.99	2/10/2017-10/25/2017	100%
MW-4	Regional	LCRS Sump 1B	92.4	96.00	91.45	3.60	1.10	3/14/2017-6/12/2017	35%
MW-4S	Regional	LCRS Sump 1B	92.4	96.11	91.58	3.71	1.21	3/14/2017-6/12/2017	35%
T-2	Regional	LCRS Sump 1B	92.4	95.34	91.68	2.94	0.44	3/14/2017-6/12/2017	35%
T-2S	Regional	LCRS Sump 1B	92.4	96.35	91.85	3.95	1.45	3/14/2017-6/12/2017	35%
T-3	Regional	LCRS Sump 1B	92.4	97.15	92.70	4.75	2.25	3/14/2017-8/2/2017	62%
T-4	Regional	LCRS Sump 1B	92.4	95.53	91.15	3.13	0.63	3/14/2017-6/12/2017	35%
VZW-4	Shallow	LCRS Sump 1B	92.4	101.28	100.67	8.88	6.38	2/10/2017-10/25/2017	100%
VZW-T1	Shallow	LCRS Sump 1B	92.4	Dry	Dry	Dry	Dry	2/10/2017-10/25/2017	Dry
VZW-T2	Shallow	LCRS Sump 1B	92.4	109.55	107.02	17.15	14.65	2/10/2017-10/25/2017	100%
VZW-T3	Shallow	LCRS Sump 1B	92.4	110.71	106.57	18.31	15.81	2/10/2017-10/25/2017	100%

[1]Includes capillary fringe of 2.5 feet
[2]Does not include capillary fringe of 2.5 feet

97. The monitoring results indicate that for extended periods of time groundwater (GW) including capillary fringe exists at an elevation (EL) higher than the point of compliance (POC) for determining groundwater separation. The monitoring results show that groundwater at times exerts hydrostatic (head) pressure on the bottom liner system which means that at times no unsaturated zone exists below WMU 1.

98. However, the Discharger's current design provides a capillary break within the sump area through use of a leak detection system. If a leak were to occur through the secondary liner (barrier layer) the leak detection system would provide an unsaturated zone within leak detection sump area so long as the Discharger maintains unconfined (unsaturated) conditions in the leak detection system.

99. Unfortunately, the Discharger's current (see Attachment L) and proposed design for future WMU cells (see Attachment M) does not provide a capillary break along the side slopes of the WMU and therefore does not ensure that the Discharger is able to maintain groundwater separation at all times along the side slopes.

100. Monitoring results show that groundwater in the Shallow Zone exists along the side slopes of the WMUs at elevations above the POC for groundwater separation determination. Without a capillary break which creates an unsaturated zone above the secondary liner (barrier layer) groundwater pressure along the side slopes where a secondary liner (see Attachment L) does not exist such as in WMU 1, Cell 1, Phases 1-2; and Cell 2, Phases 1 -2, and WMU 1, Cell 2, Phase 3 would infiltrate the compacted clay liner and violate the current 2.5 foot engineered alternative groundwater separation requirement.

101. The same is true for WMU 1, Cell 1, Phase 4; Cell 3, Phases 1-2; and Cell 2, Phase 4 (see Attachment L) where although a secondary liner exists on the side slopes, a leak detection system was not installed to provide a capillary break (unsaturated zone) on the side slopes. In this case, hydrostatic pressure from groundwater in the Shallow Zone along the side slopes when in contact with the fine grain materials of the compacted clay liner and earthen fill due to a leak, would cause the Discharger to violate the current 2.5 foot engineered alternative groundwater separation requirement due to absence of a capillary break.

102. The Discharger's 2017 1st Semiannual Monitoring and Reporting Program (MRP) Report showed that water levels in Best Slough, adjacent to the southern side of WMU 1 varied from around 111 to 115 feet elevation (NAVD88). This water level is at or above the water levels reported in the Shallow Zone VZW monitoring wells during January through June 2017.

103. Furthermore, the 2017 1st Semiannual MRP Report provided a table of monitoring of liquid levels in the pan lysimeters (shown below) that further supports the conclusion that groundwater at elevations above the POC and in contact with the side slopes of WMU 1 in violation of the current 2.5 foot groundwater separation requirement.

Pan Lysimeter Liquid Levels (ft. depth)						
Date	**PL-1A (Unsealed)[1]**	**PL-1B (Sealed)[2]**	**PL-2A (Unsealed)**	**PL-2B (Unsealed)**	**PL-3A (Sealed)**	**PL-3B (Sealed)**
1/27/2017	0.4	Dry	Dry	Dry	0.4	0.5
2/17/2017	0.4	Dry	Dry	Dry	**19**	1.7
3/13/2017	0.4	**3.61**	0.5	Dry	0.5	0.4
4/13/2017	0.6	0.7	0.5	Dry	0.3	0.5
5/18/2017	0.6	**5.2**	0.6	Dry	0.2	0.5
6/12/2017	0.4	**4.6**	0.8	Dry	0.3	0.3

[1]Unsealed means the pan lysimeter liner **was not** welded to the secondary HDPE liner of the WMU base liner containment system.
[2]Sealed means the pan lysimeter liner **was** welded to the secondary HDPE liner of the WMU base liner containment system.

If the Discharger is consistently removing any liquid that accumulates with its leak detection system directly above the secondary liner (barrier layer) the only possible source of liquid elevations ranging from 3.61 to 19 feet in sealed pan lysimeters PL-1B and PL-3A is from a leak in the pan lysimeter liner. Liquid under hydrostatic pressure acting on the outside of the sealed pan lysimeter enters the pan lysimeter through a defect in its liner and hydrostatic pressure inside the pan lysimeter over time reaches equilibrium with hydrostatic pressure acting on the outside of the pan lysimeter. These

revised WDRs require the Discharger to weekly monitor liquid levels in all pan lysimeters to determine whether an unsaturated zone exists below the WMU, whether groundwater separation is maintained, and potential hydrostatic pressure on the base liner system.

104. On 3 November 2017 as part of an amended ROWD the Discharger proposed a mitigation measure to ensure the approved engineered alternative of 2.5 feet separation between highest anticipated/observed groundwater and waste along the side slope of an existing WMU will be maintained. The proposed mitigation measure was "*installation of shallow piezometers in areas of potentially perched water only when they are discovered in the side slope of the liner. Water that accumulates in the perched areas will be extracted for proper disposal (i.e., re-use as dust control, discharge to a POTW, etc.)*". This includes groundwater extraction from existing piezometers and groundwater monitoring wells installed in the Shallow Zone where groundwater exists above the POC.

105. For excavation of new landfill cells the Discharger proposes to (1) map and document exposed ancestral stream channels in the sidewalls of the excavation, (2) install shallow piezometers in areas that have medium or high potential to transmit water to the side slope, (3) extract groundwater from the piezometers adjacent to the sidewalls in the medium and high potential areas where groundwater exists, and (4) in areas of low potential for water transmission the Discharger will excavate to an appropriate depth below its location on the side slope and the excavation filled with compacted clay soil from the on-site borrow source.

106. Central Valley Water Board staff has reviewed the proposed mitigation measures in the Findings above for existing and future landfill cells and finds that the mitigation measures **may not** provide sufficient assurance that 2.5 feet separation will be maintained between highest anticipated/observed groundwater including capillary fringe and waste along the base and side slopes of existing and future landfill WMU cells for the following reasons:

    a. It is highly likely that as described by the Discharger some of the buried ancestral stream channel meanders (Shallow Gravel Zone or SGZ) of Best Slough may not be interconnected. Therefore, it will be very difficult for the Discharger to ensure that it has complied with maintaining groundwater separation along the entire side slope perimeter of existing WMU 1 using piezometer wells for groundwater extraction. Secondly, current groundwater monitoring well spacing is not sufficient to identify all the ancestral stream channel meanders that exists along the west, north, and east sides of WMU 1;

    b. Excavation of WMU 1 changed the hydrogeology surrounding WMU 1 cutting it off along the side slopes. Shallow groundwater that is "blocked off" along the side slopes may find other preferential pathways along the side slope liner; and

    c. The Discharger suggests that the Shallow Zone groundwater and Regional Zone groundwater is separated by clayey basal sediments that create perched water conditions. If the Discharger were to install groundwater extraction well pumps at an elevation directly above the clayey basal sediments the Discharger would not be able to successfully draw down all shallow groundwater below the landfill base (POC for determining separation). Therefore, the Discharger would continue to violate groundwater separation requirements along the base and side slopes of the WMU cell.

107. Therefore, to mitigate the conditions regarding liner performance and minimum groundwater separation described in Findings 96 through 104 these WDRs in Provisions H require the Discharger to submit a Technical Report which includes a work plan for review and approval which describes how the Discharger will maintain the approved engineered alternative of 2.5 feet separation between highest anticipated/observed groundwater including capillary fringe and waste along the base and side slopes of existing WMU 1. The Technical Report shall also include a revised WMU base and side slope liner design or other means for future WMU cells that provides an unsaturated zone of sufficient thickness and of appropriate materials to maintain a capillary break such that the Discharger is able to comply with the required 2.5 feet separation between highest anticipated/observed groundwater including capillary fringe and waste along the base and side slopes of future WMU cells. The Discharger may propose other means of maintaining an unsaturated zone with capillary break around the base and side slopes such as but not limited to removing or diverting the source of groundwater in the Shallow Zone i.e., reducing or eliminating percolation of water from ground surface and cutting off any hydraulic connection with groundwater supplies such as Best Slough, stormwater water detention ponds, wetlands, or other seasonal surface water bodies such as that on Beal AFB property directly to the north of the Facility.

108. For future WMU cells Central Valley Water Board staff finds that minimum groundwater separation compliance shall be based on the shortest distance (radius) between the lowest bottom elevation of the LCRS sump and highest anticipated groundwater including capillary fringe. For determining compliance on the side slopes the distance between the elevation at which highest anticipated groundwater including capillary fringe exists (both Shallow and Regional Zones) and the shortest line projected from that elevation towards the bottom of the side slope liner.

CONSTRUCTION AND ENGINEERED ALTERNATIVE

109. 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 part 258 (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.

110. Title 27, section 20080, subdivision (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, subdivisions (c)(1) or (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, subdivision (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 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, subdivision (b)(2).

111. Water Code section 13360, subdivision (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.

ENGINEERED ALTERNATIVE DESIGN FOR SEPARATION FROM GROUNDWATER

112. Title 27 CCR section 20240 (c) requires that new landfills, waste piles and surface impoundments be "sited, designed, constructed and operated", to ensure or maintain at least five feet of separation between the contained wastes and the highest anticipated level of underlying groundwater. Existing WMUs are to be "operated" to maintain the required separation.

113. In the 1 October 2002, *Liner Performance Demonstration Report Future Class II Liner Systems, Ostrom Road Landfill,* the Discharger requested approval of an engineered alternative design (EAD) to the Title 27 CCR prescriptive standard which specifies that a minimum of five (5) feet of separation shall be maintained between waste and the highest anticipated elevation of underlying groundwater including the capillary fringe. The EAD proposed by the Discharger to mitigate the groundwater separation requirement consists of a 60-mil HDPE geomembrane, which will be installed beneath the **entire** base composite liner system to create a barrier to groundwater or capillary rise. Up to approximately 15% of the landfill (primarily in the vicinity of proposed Phase 4 of Cell 1) may have groundwater separation distances of 2.5 to 5 feet between wastes and the highest anticipated groundwater including capillary rise. The geomembrane will be overlain by a leak detection geocomposite and a prescriptive composite liner system and will serve as an integral part of the liner system. The leak detection geocomposite will extend to the leak detection monitoring sump described in Finding 127.

114. The Discharger had demonstrated in the EAD that the prescriptive standard requiring a minimum of five (5) feet of separation between the waste and the highest anticipated elevation of underlying groundwater would be unreasonable and unnecessarily burdensome. Meeting the prescriptive groundwater separation requirements would require the establishment of an interior sump located away from the landfill perimeter. These sumps are undesirable due to poor access and greater susceptibility of sump access to impacts by refuse settlement. The Discharger had demonstrated that the proposed EAD is consistent with the performance goals of the prescriptive standard and affords equivalent protection against water quality impairment.

115. However, recent groundwater monitoring (See Findings 96 through 104) has established that shallow groundwater is currently violating the approved engineered alternative design of 2.5 feet separation. Furthermore, the Discharger’s proposed design for side slope and base liner systems for future WMU cells does not ensure that compliance with the 2.5 foot separation requirement will be maintained throughout the year. These revised WDRs in Provision H require the Discharger to submit a revised WMU base and side slope liner design or other means for future WMU cells that maintains an unsaturated zone of sufficient thickness and of appropriate materials to provide a capillary break so that the

Discharger is able to comply with the approved engineered alternative of 2.5 feet groundwater separation requirement.

116. Also, these WDRs clarify the point of compliance for determining whether the Discharger is complying with the engineered alternative for groundwater separation and proper placement of the Discharger's unsaturated zone monitoring system. The Discharger's June 2017 JTD stated that for future WMU cells the Discharger intends to construct a single-composite liner system in accordance with Title 27 and State Water Board Resolution 93-62. In order to address Central Valley Water Board staff's concerns in 2001 related to the existence of shallow groundwater at the Facility the Discharger proposed to construct a 60-mil HDPE barrier layer at the base of the WMU placed 2.5 feet below the primary HDPE liner component of the single-composite system. The secondary liner component of the single-composite liner system installed directly below the primary liner was a 2.5 foot thick compacted clay liner (CCL). The barrier layer was to be used to maintain the approved 2.5-foot engineered alternative. Directly above the barrier layer and below the 2.5 foot thick CCL the Discharger proposed a leak detection system to determine whether a release has occurred from the WMU cell. Below the barrier layer the Discharger proposed to install a pan lysimeter in order to satisfy Title 27 requirements for unsaturated zone monitoring. However, the proposed configuration does not satisfy the 2.5 foot approved engineered alternative for groundwater separation or requirements for monitoring the unsaturated zone below the WMU for the following reasons:

    a. Title 27 section 20240 subdivision (c) requires separation between the location of wastes and highest anticipated elevation of underlying groundwater including capillary fringe.

    b. A release of waste from a WMU only occurs if it exists outside of the WMU containment system. In a single-composite liner the containment system includes the compacted clay liner (CCL) or engineered alternative equivalent geosynthetic clay liner (GCL).

    c. The Discharger has placed a barrier (secondary HDPE geomembrane) between its unsaturated zone monitoring system i.e., pan lysimeter and the unsaturated zone which in the case of the Discharger's proposed containment system would be the thickness of the leak detection system which is a geocomposite drainage layer less than two (2) inches thick. The secondary HDPE geomembrane does not allow the Discharger's pan lysimeter to monitor the unsaturated zone directly below the WMU containment system.

    These revised WDRs include specifications that require: (1) the unsaturated zone detection monitoring system i.e., Pan Lysimeter or other equivalent unsaturated zone monitoring system to be installed directly below the lowest point in the single composite liner system (LCRS sump), and (2) that the Discharger maintain minimum 2.5 foot separation between highest anticipated groundwater including capillary fringe and bottom of the LCRS sump.

ENGINEERED ALTERNATIVE DESIGN FOR BASE AND SIDE SLOPE LINER SYSTEM

117. The Discharger proposes a liner system which will be designed, constructed, and operated in accordance with the criteria set forth in Title 27, and the provisions in State Water Board Resolution 93-62 for municipal solid wastes.

118. The Discharger proposes the following engineered alternative liner system for future Class II landfill cells (see Attachment M):

    a. The base liner containment system on the landfill base will consist of the following components from top to bottom :

        i. 12-inches of operations soil;

        ii. 8-oz. non-woven geotextile filter;

        iii. 9-inches of LCRS (permeability greater than or equal to 1 cm/s);

        iv. 60-mil HDPE geomembrane;

        v. Geosynthetic Clay Liner with a 40-mil HDPE geomembrane backing (geomembrane

        vi. 12-inches of low-permeability soil liner (permeability less than or equal to 1×10^{-6} cm/s);

        vii. Leak detection geocomposite;

        viii. 60-mil HDPE geomembrane; and

        ix. Upper 12-inches of the subgrade consisting of fine-grained soils classified as a CH, CL, or SC

    b. The containment system on the landfill side slopes will consist of the following components from top to bottom:

        i. 24-inches of operations soil;

        ii. LCRS geocomposite drainage layer;

        iii. 60-mil HDPE geomembrane;

        iv. Geosynthetic Clay Liner

        v. 60-mil HDPE geomembrane

        vi. Upper 12-inches of the subgrade consisting of fine-grained soils classified as a CH, CL, or SC.

119. As stated in Finding 94 and Finding 102 the proposed design for future WMU cells **does not** provided groundwater separation between highest anticipated groundwater including capillary fringe in the shallow groundwater zone and waste along the side slopes. Furthermore the proposed design does not provide the approved engineered alternative separation distance of 2.5 feet along the base and side slopes since it does not provide a capillary break of at least 2.5 feet between the water table and waste.

120. The Discharger proposes to use an onsite soil borrow source for material to be used to construct the operations layer. However, the Discharger has not characterized the hydraulic conductivity of the soil used to construct the operations layer as it relates to its ability/inability to allow leachate to reach the underlying LCRS. An operations layer subjected to compaction and settlement with low hydraulic conductivity prevents leachate from reaching the LCRS system. Section H (Provisions) of these WDRs requires the Discharger to submit a technical report characterizing potential sources of operations layer soil and the hydraulic conductivity of the operations layer borrow source used to construct future phases to ensure the operations layer has sufficient hydraulic conductivity to not inhibit leachate from reaching the LCRS system. If the hydraulic conductivity is less than $1x10^{-4}$ cm/sec the Discharger shall determine the percentage of area using high permeability "windows" such that the weighted average hydraulic conductivity is minimum $1x10^{-4}$ cm/sec.

ENGINEERED ALTERNATIVE FOR LEACHATE CONTROL AND REMOVAL SYSTEM

121. The Discharger provided an engineering analysis that demonstrated in the JTD that the 9-inch thick LCRS can collect and remove 45 times the anticipated peak daily leachate volume. The LCRS in all future cells will consist of a 9-inch thick gravel blanket drain blanket sloping at 1 to 2 percent to a central perforated header pipe which will drain with a minimum pre-settlement slope of 0.5 percent to the LCRS sumps. The LCRS gravel will be overlain by a filter geotextile. The central head collection pipes will be placed within the 9-inch thick gravel blanket drain. The pipes for future WMUs will be 6-inch diameter, HDPE with a size-dimension ratio (SDR) of 11. The LCRS gravel or an equivalent drainage media will provide a minimum hydraulic conductivity of 1 cm/sec. A peak leachate generation rate of 350 gallons/acre/day has been reported as the maximum anticipated leachate flow during the operational life of the Facility.

122. The Discharger's June 2017 JTD in Appendix F.1 provided engineering calculations for determining differential settlement below WMU 1. The Discharger's criterion for acceptable post-settlement slope on the base of a WMU was whether any positive slope towards the LCRS existed after settlement. The Discharger design proposed a "saw tooth" base grading configuration as shown in Attachment I. The pre-settlement saw tooth drainage system has between one to two percent positive slope within the blanket drain (area collector) towards the LCRS collection laterals (LCRS pipes) and 0.5 percent positive slope along the collection laterals towards the perimeter of WMU 1. The collection laterals then discharge to main collector also having 0.5 percent positive slope. The Discharger's analysis assumed amongst other things (1) waste density of 70 lbs./ft^3, (2) groundwater at 72 feet below base elevation, (3) a preconsolidation pressure of 5,000 lbs./ft^2, (4) primary compression ratio of 0.05, (5) 6-inch SDR11 collection lateral pipes, and (6) a recompression ratio of 0.02. The analysis indicated that post-settlement slope of collection laterals in WMU1 Cell 1 Phase 4 could be 0.33 percent positive slope in the LCRS collection laterals and in proposed WMU 2 Cell 8B post-settlement slope in collection laterals would be 0.4 percent positive slope. The analysis only used the endpoints of the collection lateral to determine overall slope and did not consider any differential settlement that could occur between the endpoints.

123. In a meeting on 20 September 2017, Central Valley Water Board staff indicated to the Discharger that the engineering analysis for calculating post-settlement slope did not consider (1) current information on groundwater elevations at the site which effects

effective stress on the soil, (2) does not use an appropriate waste density for proposed final waste heights of 210 to 267 feet, and (3) is not consistent with USEPA guidance documents[8] for implementation of 40 CFR 258 regulations.

124. On 3 November 2017 as part of an amended ROWD, the Discharger provided a revised base settlement analysis where the Discharger considered the items identified in Finding 109. The Discharger determined that the results of the analysis still provided positive slope of 0.31%. The Discharger in its analysis did not use the recompression ratio in its previous analysis of 0.02 but instead used a lower recompression ratio of 0.009 which in turn would yield lower settlement in soils up to around 41 feet below ground surface where groundwater is assumed to be at 72 feet bgs and around 81 feet below ground surface if groundwater is assumed to be 2 feet bgs.

125. Based on the findings above and the following uncertainties and limitations associated with the revised settlement analysis these WDRs require the Discharger in Provisions H.10 to grade the base of future WMU cells with a two percent downward post settlement slope towards the leachate collection and removal system (LCRS) sump between all points on the base of each future waste management unit (WMU) cell to ensure proper functionality of its LCRS throughout the life of the WMU. If the Discharger proposes a post settlement slope of less than two percent but not less than one percent towards the leachate collection and removal system (LCRS) sump between all points on the base the Discharger shall submit a Technical Report which supports a post settlement slope at all points along the base of greater than one percent but less than two percent. The Discharger's Technical Report will take into consideration:

    a. The minimum postsettlement slope required for a geocomposite leak detection layer to drain unconfined flow effectively to its sump;

    b. The minimum scouring flow velocity required in the LCRS pipes;

    c. The base LCRS system design does not contain provisions to monitor and measure LCRS collector pipe slopes as settlement occurs during the life of a WMU. The Discharger shall provide means to monitor settlement and slope within the LCRS pipes;

    d. The differential settlement that could occur unevenly along lateral flow lines;

    e. the uncertainty in estimating differential settlement based on limited geologic information i.e., the variability of thicknesses and placement of consolidation layers within the geologic column based on an alluvial geologic setting;

    f. the uncertainty in estimating differential settlement based on variability of the primary compression index, recompression index, and initial void ratio;

    g. the uncertainty associated with using the HELP model results to calculate leachate flow and maximum head in the LCRS layer when the HELP program does not model the

[8] USEPA Solid Waste Disposal Facility Criteria Technical Manual, EPA530-R-93-017, Section 4.3.3 Pages 165-167; USEPA Seminar Publication, Design, Operation, and Closure of Municipal Solid Waste Landfills, EPA/625/R-94/008, Section 3.4.2.

need and use of high permeability windows (gravel windows) to ensure leachate can pass through a low permeability operations layer;

h. Using a performance standard as the supporting evidence for the engineered alternative without providing means to monitor the engineered alternative's performance. It will be unclear whether the performance standard of keeping hydraulic head on the primary liner to less than 30 cm (12 inches) will be met throughout the base of the WMU unless the discharger is able to monitor differential settlement , slopes in the LCRS pipes, and associated leachate head on the base throughout the life of the WMU; and

i. There is no feasible corrective action proposed if the performance standard is not met.

126. Each of the LCRS sumps in future cells will be designed with a leak detection monitoring sump below the primary base liner system. The leak detection monitoring sump will be excavated into the subgrade below the LCRS sump at the lowest point of the WMU floor. Access to the leak detection sump will be via a slope riser pipe. Any liquids in the leak detection monitoring sump will be removed with a pump via the slope riser pipe.

127. Pan lysimeters are installed beneath the liner system for the purposes of unsaturated zone monitoring. The pan lysimeter(s) consist of: 1) an underlying 60-mil HDPE liner on a prepared subgrade below the leachate sump(s); 2) a lysimeter geocomposite overlain by a 12-inch diameter perforated HDPE pipe (connected to a 12-inch diameter solid HDPE lysimeter riser pipe) covered by 18-inches of drainage rock; 3) and a 60-mil HDPE leak detection system geomembrane covering the pan lysimeter(s).

128. In 2003, the Regional Water Board revised Order No. 96-218 in adopting Order No. R5-2003-0018 in response to a request from the Discharger to change the configuration of the landfill. On 23 June 2006, the Regional Water Board issued previous WDRs Order No. R5-2006-0068 in response to a request from the Discharger to increase the allowable depth of leachate on the liner system to allow for safe pumping operations as required by Title 27.

ENGINEERED ALTERNATIVE DESIGN FOR COMPACTED CLAY LINER

129. The Discharger proposes a liner system which will be designed, constructed, and operated to prevent migration of wastes from the Unit to adjacent natural geologic materials, groundwater, or surface water during disposal operations, closure, and the postclosure maintenance period in accordance with the criteria set forth in Title 27 for Class II WMUs.

130. The Discharger adequately demonstrated that construction of the liner prescriptive standard for the Class II surface impoundment as described in Title 27, section 20330, subdivision (b) requiring use of 2-foot minimum thickness clay liner would be unreasonable and unnecessarily burdensome when compared to the proposed engineered alternative design using an equivalent geosynthetic clay liner (GCL) because there is no clay source on-site 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 proposed engineered alternative is consistent with

the performance goals of the containment structures for a Class II surface impoundment and affords equivalent protection against water quality impairment.

BIOSOLIDS MANAGEMENT FACILITY (BMF) CLASS II SURFACE IMPOUNDMENTS

131. In addition to waste disposal operations, the Discharger proposes to operate a temporary BMF, which could include up to two 5-acre Class II surface impoundments located in Cell 8A. Initially, the Discharger plans to construct only one surface impoundment. A second surface impoundment would be added if biosolids demand is sufficient to make it economically viable. The Facility would accept and store up to 25,000 tons of dewatered sewage and water treatment sludge from domestic and municipal wastewater treatment plants and water treatment plants in the surface impoundment(s) during the winter months and conduct sludge drying operations in the adjacent BSDBs during the dry season (April 15th through October 15th). The contents of the Class II surface impoundments will be either pumped with sludge pumps or excavated and transported to the BSDSs for drying. The BMF Class II surface impoundments are temporary in that they will be clean-closed to make room for landfill WMU 2 as it is developed westward.

132. The Title 27 CCR prescriptive liner requirement for a Class II surface impoundment is a double liner system consisting of two layers of compacted clay that are two feet thick and have a hydraulic conductivity of $1x10^{-6}$ cm/s or less. An LCRS is required between the clay liners.

133. The Discharger proposes an engineered alternative to the prescriptive liner requirements of Title 27 CCR for the Class II surface impoundment.

    a. The engineered alternative consists of the following components from the top to bottom:

        i. 1.5 feet of operation soil;

        ii. Primary 60-mil textured HDPE Geomembrane;

        iii. Geonet or Geocomposite LCRS;

        iv. Secondary 60-mil textured HDPE Geomembrane; and

        v. 1 foot of low-permeability soil liner ($k \leq 1x10^{-6}$ cm/s).

    b. Additional design features of the Class II surface impoundment include:

        i. A minimum freeboard of 2 feet to accommodate precipitation;

        ii. A LCRS to monitor and extract liquids from the leak detection layer. Extracted liquids will be pumped back into the surface impoundment. An action leakage rate (ALR) of 500 gallons per day is proposed in which leakage rates greater than the ALR will trigger an investigation to find the source of the leak(s) in the primary liner, and then implementation of corrective actions to repair the leak(s).

        iii. A pan lysimeter will be located below the LCRS sump to monitor the unsaturated zone.

iv. If necessary, excess liquids will be pumped from the surface impoundments and stored in tanks until it can be transported to the Marysville wastewater treatment plant for disposal.

BMF BIOSOLIDS SLUDGE DRYING BEDS (BSDBs)

134. The BSDBs area comprises 10.5-acres located in Cell 7A and the southern portion of Cell 8A (see Attachment B). The BMF Class II LTU(s) are temporary in that they will also be clean-closed to make room for landfill WMU 2 as it is developed westward.

135. Groundwater beneath the BMF area currently occurs in the Shallow and Regional Zones described in Finding 49.

136. The Discharger proposes to construct the BSDBs with a liner system consisting of the following components from top to bottom:

a. A minimum two-foot thick operations soil layer;

b. An LCRS consisting of either a geocomposite drainage layer or a minimum of 9-inches of permeable drainage gravel;

c. A 60-mil thick HDPE geomembrane layer; and

d. The upper 12-inches of subgrade soils consisting of soils classified as a CH, CL, or SC per the Unified Soil Classification System.

137. At the end of the drying season, the Discharger plans to remove all sewage and sludge materials from the BSDBS. Soil pore liquid samples taken from pan lysimeters or other unsaturated zone monitoring devices constructed below the lined BSDBS to confirm that waste constituents have not migrated below the BSDBS.

LANDFILL OPERATIONS

138. The refuse fill is placed in lifts 10 to 15 feet thick. Refuse is spread and compacted in 2-foot-thick layers on a 5:1 to 3:1 (maximum) sloped working face, consistent with optimum slope angles for landfill compaction equipment operation. At the end of each working day, the active working face is covered with 6-inches of on-site soil or ADC material. One foot of soil is placed on any area that will not receive wastes for 180 days. Surface grading is maintained at all times to insure lateral runoff and to prevent ponding over areas in which waste is buried.

139. The RWD/JTD includes information on the overall soil balance and the amount of soil material needed for future landfill construction activities and operations. The Discharger estimates that there is about 285,636 cubic yards of excess soil available for liner construction, daily and intermediate cover, and final cover through closure in 2103.

140. The RWD/JTD includes information on LCRS design and leachate management. The recorded peak leachate generation rate for the site is approximately 350 gallons gallons/acre/day. The JTD has showed that the LCRS had a capacity of 60 times this maximum historical flow rate for a 12-inch thick LCRS and 45 times this maximum

historical flow rate for a nine-inch LCRS. Leachate and landfill gas condensate is currently pumped from the landfill sumps to onsite above ground storage tanks. The tanks are drained into tanker trucks for transport to the City of Marysville wastewater treatment plant for disposal or used onsite on lined areas for dust control during the dry season (between 15 April and 15 October).

BMF SURFACE IMPOUNDMENT(S) OPERATIONS (FUTURE)

141. During the wet season, incoming de-watered sewage sludge will directed to the Class II surface impoundment(s) for storage until the dry season.

142. Biosolids from the Class II surface impoundment(s) will either be pumped with sludge pumps or excavated and transported to the Biosolids Sludge Drying Beds (BSDBs) for drying.

143. The LCRS drains to a sump where leachate and is pumped back into the surface impoundment. The LCRS is designed with capacity for at least twice the maximum anticipated daily volume of leachate.

144. Title 27, section 20375, subdivision (a) requires Class II surface impoundments to have capacity for seasonal precipitation, a 1,000-year 24-hour design storm event, and to maintain at least two feet of freeboard at all times. The 1,000-year, 24-hour storm event for the site is 8.12 inches, and is referred to hereafter as the “design storm”. For containing seasonal precipitation, the Discharger has been required to use the 100-year wet season distributed monthly to prevent overflow of the impoundment or less than two feet of freeboard during a reasonable worst-case scenario wet season. The 100-year wet season for the site is 46.3 inches.

145. This Order requires the BMF Class II surface impoundment to have capacity for leachate to the impoundment from a 100-year wet season of 46.3 inches distributed at least monthly, a 1,000-year 24-hour storm event (design storm) of 8.12 inches, and shall maintain at least two (2.0) feet of freeboard at all times. To ensure compliance with this requirement, the Discharger is required to maintain at least 2.7 feet of freeboard at all times except in the event of a storm equal to or exceeding the 1,000-year 24-hour design storm event in which case at least two (2.0) feet of freeboard must be maintained.

146. This Order includes an Action Leakage Rate (ALR) for the Class II surface impoundment LCRS. The ALR is the maximum flow rate through the primary liner to the LCRS beyond which the Discharger is required to take actions to inspect and repair the primary liner system. The ALR is based on the recommendations in the 1992 USEPA guidance document *Action Leakage Rate for Leak Detection Systems*. The guidance recommends that ALR for lined surface impoundments be set at no more than 1,000 gallons per acre per day. However, the Discharger proposing using an ALR of 100 gallons per acre per day. Using the Discharger’s recommendation, the calculated ALR is 500 gallons per day for the 5-acre impoundment. This Order sets the ALR for the surface impoundment at 500 gallons per day. The leakage rate will be calculated based on monthly readings of the flow totalizer that records flow from the LCRS manhole back to the surface impoundment.

BMF BIOSOLIDS SLUDGE DRYING BEDS OPERATIONS (FUTURE)

147. The Discharger proposes to conduct sludge drying operations during the dry season (typically between April 15th and October 15th) in the 10.5-acre BSDBS located in Cell 7A and the southern portion of Cell 8A. The start of drying season may be delayed after April 15th or the end of drying season terminated before October 15th based on actual weather conditions. Drying will involve spreading high liquid content wastes into lifts of approximately 12-inch layers until the layer dries sufficiently for its intended use. At the end of drying season, all dewatered material will be removed from the LTU. A perimeter drainage ditch will be constructed around the BSDBS to control surface water run-on. The ditch will discharge into a grass-lined swale that will eventually drain to Best Slough.

148. The BSDBS is to be used only during the dry season and only for drying high water content waste, and de-watered sewage sludge.

149. All containment structures shall be designed and constructed under the direct supervision of a California registered civil engineer or certified engineering geologist and shall be certified by that individual as meeting the prescriptive standards and performance goals of Title 27 prior to waste discharge.

150. Construction will proceed only after all applicable design reports and construction quality assurance plans have been approved.

151. The BSDBS is monitored as described in the attached monitoring and reporting program.

152. Sewage sludge will either be pumped with sludge pumps, or excavated and transported to the BSDBS at the beginning of each dry season for drying. Any incoming sludge will also be directed to the BSDBS during the dry season. Drying will involve spreading the sludge into lifts of approximately 12-inches and periodically disked to promote drying until the layer dries sufficiently for its intended use. Once dried, the sludge is removed as needed for ADC, composting, cover amendment, or manufacturing soil.

153. The proposed soil manufacturing operations will be conducted during the dry season within the BSDBS area. The manufactured soil will consist of an approximate mixture of the following; dried sludge (60%), compost overs (20%) and onsite soil (20%), or only dried sludge (70%) and soil (30%). Once mixed, the soil is stockpiled next to the WMU where it is needed for construction operations. For WMUs not scheduled for construction that year, the stockpiles are to be winterized prior to the wet season by grading and capping them (with a one-foot layer of clay) for drainage and erosion control.

LANDFILL STABILITY ANALYSIS

154. Title 27, section 20370, subdivision (a) requires Class II units to be designed to withstand the maximum credible earthquake (MCE) without damage to foundation or containment structures. These revised WDRs require any future Class II surface impoundment to comply with Title 27 requirements under both static and dynamic conditions.

155. The March 2008 design report for Cell 3, Phase 1 and Cell 2, Phase 4 includes a slope stability analysis of the interim waste fill plan. The interim slopes were designed to be consistent with the final grading plan proposed in the JTD. The analysis considers both

static and dynamic (seismic) loading conditions and demonstrates that the final grading plan exceeds the regulatory requirements of Title 27 CCR and Subtitle D. Title 27 CCR and Subtitle D requires that the factor of safety (FOS) against slope failure be 1.5 or greater. For seismic stability, a design peak ground acceleration of 0.37g was used for the Maximum Credible Earthquake (MCE). The design earthquake for the seismic analyses was increased from the previous estimate of 0.33g by Anderson (1995) to reflect that the Foothill Fault system is a normal-slip fault, which typically results in higher acceleration than a strike-slip fault at the same distance. The Discharger's June 2017 JTD, Appendix P, includes an updated seismic hazard evaluation that indicates the peak ground acceleration for an MCE is 0.26g based on more recent attenuation relationships.

156. The results of the Dischargers slope stability analysis indicate a FOS of 1.5 for static conditions and calculated permanent displacement of 4 inches for the design MCE event. The calculated maximum displacement is less than the maximum allowable displacement of 12 inches commonly accepted for Class II and Class III landfills.

157. As stated in previous Findings shallow groundwater exists along the side slopes and at the base of constructed WMU cells. It is unclear whether the Discharger's stability analysis report considered saturated soils along the side slopes and base if the WMU cells. Therefore, these WDRs in Provisions H.10 require the Discharger to certify stability of the landfill WMU in accordance with Title 27 section 21750 subdivision (f)(5) due to saturated soil conditions adjacent to the landfill WMU. The certification shall consider stresses and associated strain within the geosynthetic components of the containment system.

LANDFILL CLOSURE

158. The Discharger submitted a June 2017 Joint Technical Document that included a preliminary closure and post-closure maintenance plan (PCPCMP) for the Facility. Under the PCPCMP, final cover will be constructed over the waste as part of the closure activities (see Attachment J). The maximum height for the closed Facility, including final cover, is 365 feet mean sea level (MSL), which corresponds to a height of 255 feet above grade (using a reference ground elevation of 110 feet MSL). The final cover side slopes will have a maximum slope of 3:1 (horizontal-to-vertical), with 20-foot wide benches at intervals not exceeding 50 feet vertically. The crest will have a minimum slope of five percent to ensure adequate drainage and control erosion.

159. 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 $1x10^{-6}$ 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.

160. 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.

161. The Discharger proposes an engineered alternative final cover design as follows:

a. For the **top deck** areas of the landfill consisting of (from top to bottom):

i. A one-foot thick vegetative soil layer;

ii. A 8-oz Geotextile Cushion

iii. A 60-mil HDPE geomembrane;

iv. A low-permeability geosynthetic clay layer (GCL); and

v. A one-foot thick foundation layer.

b. The **side slope** design includes (from top to bottom):

i. A one-foot thick vegetative soil layer;

ii. A geocomposite drainage layer;

iii. A 60-mil HDPE geomembrane; and

iv. A one-foot thick foundation layer.

The Discharger has previously made the demonstration that the EAD will provide equal or better performance than the prescriptive standard. The Discharger showed that the geosynthetic materials proposed can tolerate substantially higher strains up to 10 to 18 percent or greater before yielding and can tolerate strains 10 times larger than its soil components. As such, a two-foot thick foundation is not necessary for geosynthetic materials and that a one-foot thick foundation layer is adequate to provide a clean, firm surface for its installation. In addition, the Discharger provided a hydraulic equivalency evaluation for the system using HDPE that showed significantly improved infiltration performance over the prescriptive cover system. The EAD was described and approved in previous WDRs Order No. R5-2003-0118.

162. However, recent information submitted in The Discharger's June 2017 JTD indicates that the proposed engineered alternative final cover design does not comply with Title 27 section 21090 subdivision (a)(2) requirements that final cover low-hydraulic conductivity layer attain a hydraulic conductivity equal to the hydraulic conductivity of any bottom liner system, or underlying natural geologic materials, whichever is less permeable, or another design which provides correspondingly low through-flow rate throughout the postclosure maintenance period. The Discharger stated that the peak infiltration rate of the proposed EAD side slope design was calculated to be 0.04 gallons per acre per day (gpad) and for the proposed EAD top deck design was calculated to be 0.58 gpad. However in Appendix E of the Discharger's June 2017 JTD the Discharger's consultant Golder Associates in a 1 October 2002 *Liner Demonstration Report for Future Class II Liner Systems* calculated a single composite geomembrane/GCL liner system to have a maximum leakage potential

of 0.005 gpad. The Discharger's proposed side slope design will allow more than ten times more leakage than a 40 CFR 258 compliant bottom liner system and more than one 110 times more leakage through the proposed top deck design than a 40 CFR 258 compliant bottom liner system. These revised WDRs in Provisions H.10 requires that the Discharger submit a final cover design that complies with Title 27 section 21090 subdivision (a) and meets the equivalency requirement of subdivision (a)(2) for the through-flow rate of the WMU's bottom liner system.

163. This Order approves any future proposed final closure cover(s) so long as it complies with Title 27 section 21090 subdivision (a), closure and post-closure maintenance specifications E.2, Provisions H.10, and the final closure and post-closure maintenance plan, design documents, and CQA plan be submitted for review and approval at least 180 days prior to actual closure. The Discharger must also submit a technical report as part of its final construction report that demonstrates and certifies that any testing required and any limitations or additional requirements specified in the final closure cover's slope stability analysis report was complied with during construction in order to validate the slope stability analysis report conclusions.

164. Pursuant to Title 27, section 21090, subdivision (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.

165. Construction will proceed only after all applicable construction quality assurance plans have been approved by the Executive Officer.

CLASS II SURFACE IMPOUNDMENT AND BSDBS CLOSURE

166. These revised WDRs contain prohibitions, specifications, monitoring requirements, and provisions permitting the Discharger to construct future Class II surface impoundments and land biosolids sludge drying beds (BSDBs) at the Facility. These WDRS require the Discharger upon closure of any Class II surface impoundment or BSDBs, to clean-close the unit pursuant to Title 27, section 21400, subdivision (b)(1). If after reasonable attempts to remove contaminated natural geologic materials, the Discharger demonstrates that removal of all remaining contamination is infeasible, these WDRs allow the impoundment to be closed as a landfill pursuant to Title 27, section 21400, subdivision (b)(2)(A).

LANDFILL POST-CLOSURE MAINTENANCE

167. The Discharger submitted a *Preliminary Postclosure Maintenance Plan,* as section 8.3 of the Discharger's June 2017 JTD for closure and post-closure maintenance of the landfill (2017 Plan).

168. The 2017 Plan also included inspection, maintenance, and monitoring of the landfill during the post-closure maintenance period, and included a post-closure maintenance cost estimate for the entire Facility. Inspection and maintenance will include the condition of the final cover, drainage features, LCRS, groundwater monitoring wells, unsaturated zone monitoring points, access roads, landfill gas system, any groundwater corrective action system, and site security. The 2017 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. These revised WDRs require the Discharger to implement a final postclosure maintenance plan based on the 2017 Plan for the postclosure maintenance period.

169. 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, subdivision (e)(2), this Order requires iso-settlement maps to be prepared and submitted every five years.

170. The completed final cover will be periodically tested for damage or defects by monitoring surface emissions pursuant to California Code of Regulations, title 17 (Title 17), section 95471, subdivision (c); and Title 27, section 21090, subdivision (a)(4)(A). Defects will be repaired and tested for adequacy based on the closure CQA Plan.

FINANCIAL ASSURANCES

171. 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 June 2017 JTD section 8.2 described the Discharger's *Preliminary Closure Plan* and section 8.4 included a cost estimate for landfill closure using updated 2016 California Department of Transportation Labor Surcharge and Equipment Rental Rates. The lump sum estimate is for the cost to close 225 acres at any one time. The total amount of the closure cost estimate in 2016 dollars was $25.4 million. This Order requires that the Discharger maintain financial assurance with CalRecycle in at least the amount of the closure cost estimate to be funded and incurred incrementally as specified by Title 27 during the operational life of the landfill as areas are filled to the final grade.

172. Title 27, sections 21840 and 22211 requires a cost estimate for landfill post-closure maintenance. The Discharger's June 2017 JTD section 8.3 described the Discharger's *Preliminary Post Closure Maintenance Plan* and section 8.4 included a cost estimate for landfill closure. The amount of the cost estimate for post-closure maintenance in 2016 dollars for the 30-year post closure period was $10.3 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.

173. Title 27, section 22100, subdivision (b) requires owners and operators of disposal facilities that are required to be permitted as solid waste landfills to provide cost estimates for initiating and completing corrective action for known or reasonably foreseeable releases of waste. Title 27, section 22101 requires submittal of a *Water Release Corrective Action Estimate* and a *Non-Water Release Corrective Action Cost Estimate*. The *Water Release Corrective Action Estimate* is for scenarios where there is statistically significant evidence of a release of waste to ground or surface water when comparing point-of-compliance analyte concentrations to background concentrations. The *Non-Water Release Corrective Action Cost Estimate* is for complete replacement of the landfill final cover system, however a site-specific corrective action plan pursuant to Title 27, section 22101, subdivision (b)(2) may be provided in lieu of the final cover replacement cost estimate.

Title 27, section 22221 requires establishment of financial assurances in the amount of an approved *Water Release Corrective Action Estimate* or an approved *Non-Water Release Corrective Action Cost Estimate*, whichever is greater.

174. In August 2017 the Discharger estimated a cost of $1,494,557 for corrective action of all known or reasonably foreseeable releases to groundwater. The Discharger's most recent cost estimate is $720,814 less than the previous inflationary adjusted cost of $2,215,371 (i.e., November 2012 cost estimate [$2,064,600] adjusted for inflation) as reported by the Discharger on 8 June 2017. The Discharger stated that the primary basis for the lower cost estimate as part of the most recent analysis corresponds to reduced annual O&M/monitoring/reporting costs and reduction of the corrective action treatment period from 20 years down to 15 years. Therefore, this Order requires that the Discharger maintain financial assurance with the CalRecycle in at least the amount of the most recent cost estimate of $1,494,557 adjusted annually for inflation.

CEQA AND OTHER CONSIDERATIONS

175. 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.

176. 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 federal regulations of 40 C.F.R. part 258 ("Subtitle D"), as required by State Water Board Resolution 93-62.

177. Based on the threat and complexity of the discharge, the Facility is determined to be classified 1-B as defined below:

    a. Category 1 threat to water quality, defined as, "Those discharges of waste that could cause the long-term loss of a designated beneficial use of the receiving water. Examples of long-term loss of a beneficial use include the loss of drinking water supply, the closure of an area used for water contact recreation, or the posting of an area used for spawning or growth of aquatic resources, including shellfish and migratory fish."

    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."

178. In October 1968, the State Water Board adopted its *Statement of Policy with Respect to Maintaining High Quality of Waters in California*, State Water Board Order WQ 68-16 (Anti-Degradation Policy). Incorporated into the Central Valley Water Board's Basin Plan, the policy limits board discretion to authorize the degradation of "high-quality waters," defined as where water quality is more than sufficient to support beneficial uses designated in the Basin Plan. Whether or not a water is a "high-quality" is determined on a constituent-by-constituent basis, which means that an aquifer can be considered "high-quality" with respect to some constituents, but not others. (State Water Board Order No. WQ 91-10.)

179. The Anti-Degradation Policy applies when an activity discharges to "high quality" waters and the discharge will result in some degradation in water quality. When it applies, the Anti-Degradation Policy requires that WDRs reflect best practicable treatment or control (BPTC) of wastes, and that any degradation of "high quality" waters "(a) will be consistent with the maximum benefit to the people of the State, and (b) will not result in an exceedance of water quality objectives." If an activity will not result in the degradation of "high quality waters," the policy does not apply, and the Discharger need only demonstrate that it will use "best efforts" to control its discharge of waste.

180. The Anti-Degradation Policy does not apply to the discharge of waste from the Recology Ostrom Road Landfill Facility. The WDRs in this Order are designed to ensure that any such wastes remain contained at the Facility, and will not reach waters of the State. The requirements reflect the Discharger's best efforts to control such wastes.

181. Water Code section 13267, subdivision (b) provides that:

> In conducting an investigation…, the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharge or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes 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 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.

182. The technical reports required by this Order and the attached MRP No. R5-2018-0007 (incorporated herein) 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

183. 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.

184. 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.

185. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.

186. 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 (Title 23), section 2050 et seq. 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 Water Code sections 13263 and 13267, that Order R5-2009-0020 is rescinded except for purposes of enforcement, and that the Recology Ostrom Road (Discharger), as well as its agents, successors and assigns, in order to meet the provisions of Division 7 of the Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of ‘hazardous waste’ is prohibited with the exception of hazardous asbestos containing wastes (ACW), which may be discharged to the landfill WMUs at the facility. For the purposes of this Order, the term ‘hazardous waste’ is as defined in Title 23, section 2510 et seq.

2. The disposal of containerized liquids at this Facility is prohibited.

3. The cessation of any corrective action measure (e.g. landfill gas extraction, groundwater extraction, etc.) is prohibited without written Executive Officer approval. If routine maintenance or a breakdown results in cessation of corrective action for greater than 24 hours, the Discharger shall notify Board staff.

4. The discharge of wastes outside of a WMU or portions of a WMU specifically designed for their containment is prohibited.

5. The discharge of waste constituents to the unsaturated zone or to groundwater is prohibited.

6. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.

7. The discharge of contaminated groundwater, industrial storm water, or wastewater to waters of the United States is prohibited without an NPDES permit authorizing the discharge.

8. The discharge of wastes that have the potential to reduce or impair the integrity of containment structures is prohibited.

9. The discharge of wastes which, if commingled with other wastes in the WMU, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products which in turn require a higher level of containment than provided by the Unit, or are "restricted hazardous wastes", is prohibited.

10. The Discharge of any liquid wastes to any Class II surface impoundment prior to submittal of a final construction report, completion of electronic leak survey of the primary and secondary geomembrane liners used for waste containment, receipt of Central Valley Water Board's approval of the construction, and approval of financial assurance documents by the Central Valley Water Board staff is prohibited.

11. The discharge of any waste, including liquids such as but not limited to landfill leachate, landfill gas condensate, and landfill underdrain discharges into a closed WMU is prohibited.

12. The discharge to the Facility of liquid or semi-solid waste (i.e. waste containing less than 50% of solids), except dewatered sewage, water treatment sludge, or leachate and landfill gas condensate for dust control in lined landfill areas as provided in Title 27 sections 20200 subdivision (d), 20220 subdivision (c), and 20340 subdivision (g), is prohibited.

13. 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.

14. The ponding of any liquid on any landfill WMU that has received waste is prohibited.

15. The Discharger is prohibited from performing composting operations at the Facility unless the Discharger submits an amended ROWD and receives approval through revision of these WDRs or through approval under separate WDRs.

16. The wood waste coloring operation is prohibited from causing a nuisance, or degrading receiving water quality at the Facility.

17. The discharge of wastes (including composting wastes) as part of the final cover for any landfill is prohibited. Compost or dried sewage sludge from the BSDBS may be used as a soil amendment over intermediate or final cover to promote vegetative growth, if applied at agronomic rates and there is no threat to water quality from storm water runoff. Soil that contains waste may be used in the foundation layer.

18. The discharge of dewatered sewage and water treatment sludge to the biosolids sludge drying beds is prohibited from 16 October through 15 April of each year.

19. The Discharger is prohibited from receiving high liquid content waste at the Facility unless it is managed in accordance with Title 27 section 20200(d).

20. Storage of dewatered sewage and sludge (that contain at least 20 percent solids by weight for primary sludge or at least 15 percent solids for secondary sludge) on a WMU prior to co-disposal where liquids from the dewatered sludge is allowed to percolate into the waste i.e., exceeds its moisture holding capacity as a result of waste management operations, compaction or settlement is prohibited. The Discharger is prohibited from allowing seeps from the dewatered sewage and sludge from occurring while the material is being stored on a WMU.

21. The Discharger is prohibited from using contaminated soils as cover during periods of rain.

22. The discharge of waste from the Class II surface impoundment containing leachate and landfill gas condensate, except for use for dust control in the lined Class II landfill areas, is prohibited.

23. The discharge of leachate for soil moisture conditioning is prohibited unless the leachate is “solidified” in accordance with Title 27, section 20200, subdivision (d) prior to placement of conditioned soil in a solid waste WMU.

24. Except for the Class II surface impoundment, the discharge of waste to ponded water from any source is prohibited.

25. The discharge of waste within 50 feet of surface waters is prohibited.

26. The Discharger is prohibited from constructing and/or operating containment structures for the purpose of containing liquids such as but not limited to non-contact storm water detention/sedimentation basins, and liquid conveyance structures at the Facility where the discharge from such structures interferes with the Discharger’s ability to collect and analyze representative samples from receiving waters necessary for the purpose of providing best assurance of the earliest possible detection of a release and/or demonstrating the effectiveness of a corrective action program. Furthermore, the discharge from such structures causing a violation of the Discharger's groundwater separation requirement between waste and groundwater including the capillary fringe is prohibited.

27. The Discharger is prohibited from using alternative daily cover (ADC) material on areas of the landfill that drain or cause percolation outside of the limits of the contiguous landfill Unit’s LCRS unless the Discharger demonstrates to Central Valley Water Board staff that runoff and/or percolation from the LEA approved ADC will not degrade or pose a threat to receiving surface and/or groundwater quality if the Discharger proposes to use the ADC on areas of the landfill that drain and/or percolate outside of the limits of the contiguous landfill unit’s LCRS. This demonstration may take removal of sediment or suspended solids into account for landfills where surface water drains to a sedimentation basin.

28. The Discharger is prohibited from installing underground utilities in or below any low permeability layer of a WMU final closure cover.

29. The Discharger is prohibited from installing underground utilities that convey liquids in any layer of a final cover system where postclosure land use, or differential settlement not accounted for in the design and construction of the underground utilities, may damage such underground utilities unless the Discharger institutes periodic inspection of the underground utilities to ensure that liquids are fully contained.

30. The Discharger is prohibited from conducting post closure land uses over a closed WMU that interferes with the closed WMU's landfill gas extraction system.

31. The Discharger is prohibited from conducting post closure land uses over a closed WMU where the final closure cover is an Evapotranspirative (ET) cover and the proposed post closure land use interferes with the ET cover's ability to prevent infiltration of liquids into the Unit.

32. The Discharger shall comply with all Standard Prohibitions listed in section C of both the Landfill SPRRs and Class II SPRRs, as incorporated herein.

B. DISCHARGE SPECIFICATIONS

1. The Discharger shall only discharge wastes to the WMUs in accordance with the wastes listed in Table 1 below.

WASTE ACCEPTANCE BY LANDFILL UNITS				
Title 27 Waste Type	**WMU 1 and 2**	**Class II Surface Impoundment**	**Sludge Class II Surface Impoundment**	**Biosolids Sludge Drying Beds**
MSW	Yes	No	No	No
Inert C&D (e.g., concrete, cured asphalt, brick)	Yes	No	No	No
Nonhazardous C&D, commercial, & industrial	Yes	No	No	No
Designated C&D, commercial, & industrial	Yes	No	No	No
Contaminated Soil (C-Soil)	Yes	No	No	No
Leachate and LFG Condensate[4]	Yes	Yes	No	No
Asbestos containing wastes	Yes	No	No	No
Treated Wood Waste	Yes	No	No	No

WASTE ACCEPTANCE BY LANDFILL UNITS				
Title 27 Waste Type	**WMU 1 and 2**	**Class II Surface Impoundment**	**Sludge Class II Surface Impoundment**	**Biosolids Sludge Drying Beds**
Dewatered Sewage and Water Treatment Sludge[3]	No	No	Yes	Yes
Dredge debris	Yes	No	No	No
Special Wastes[2]	Yes	No	No	No

1. LC-soil re-classified as “nonhazardous” by the Department of Toxic Substances Control and as approved by Central Valley Water Board in 1993 and 1994 may be used as foundation cover soil.
2. Special wastes as defined by Title 27 (e.g. triple-rinse pesticide containers, tires, large dead animals, medical wastes. Incinerator ash, and agricultural wastes)
3. Dewatered sewage and water treatment sludge is sewage sludge/biosolids consisting of non-hazardous domestic sewage and water treatment sludge from publicly owned treatment works (POTWs).
4. Leachate and LFG condensate shall only be returned to a WMU for dust control purposes.

2. Wastes shall be discharged only into WMUs specifically designed for their containment and/or treatment, as described in this Order. Class II landfills shall include liner systems which prevent the movement of fluid, including waste, landfill gas condensate, and leachate from the WMUs.

3. The discharge of waste shall remain within the designated disposal area at all times. The discharge of any waste outside of designated disposal areas is a violation of these WDRs.

4. The discharge of waste shall not cause a nuisance condition.

5. The Discharger shall immediately remove and relocate any hazardous wastes discharged at this Facility in violation of this Order. For the unauthorized discharge of hazardous waste (e.g., waste that has not been granted a variance from hazardous waste management requirements pursuant to Health & Saf. Code, § 25143), the Discharger upon discovery shall immediately notify Central Valley Water Board staff and Department of Toxic Substances Control (DTSC) of any violations and provide a schedule for the hazardous waste’s removal.

6. The Discharger shall, in a timely manner, remove and relocate any unauthorized designated wastes discharged at this Facility in violation of this Order. If the Discharger is unable to remove and relocate the unauthorized designated waste, the Discharger shall submit a report to the Central Valley Water Board and DTSC explaining how the discharge occurred, why the unauthorized designated waste cannot be removed, and any updates to the waste acceptance program necessary to prevent re-occurrence.

7. “Treated wood” wastes may only be discharged to a WMU equipped with a composite liner and leachate collection and removal system, as described in Construction Specification D.16, and only if the wastes are handled in accordance with Health and Safety Code sections 25143.1.5 and 250150.7.

8. The Discharger shall manage treated wood at the Facility in accordance with Health & Safety Code sections 25143.1.5 and 25150.7, to ensure consistency and shall comply with all prohibitions listed in Title 22, section 67386.3. The Discharger at a minimum shall monitor the leachate and unsaturated zone beneath the WMUs that receive treated wood waste for arsenic, copper, chromium, and pentachlorophenol, common COCs associated with treated wood, as required in the Discharger’s MRP No. R5-2018-0007. If a release of leachate is verified from the WMU where treated wood is disposed, the Discharger shall follow the applicable SPRRs to address the release.

9. Discharge Specifications B.7 and B.8, above, apply only to treated wood waste that is a hazardous waste solely due to the presence of a preservative in the wood, and is not subject to regulation as a hazardous waste under the federal act.

10. Treated wood waste shall not be discharged to landfill cells that have a confirmed leachate release. Treated wood waste shall not be discharged to any landfill cell after confirmation of a release from that cell to either the unsaturated zone or groundwater until corrective action results in cessation of the release.

11. Friable asbestos shall only be accepted if double wrapped and manifested.

12. Food processing waste will be accepted only if greater than 50 percent solids by weight.

13. Agricultural waste accepted at the site includes but not limited to bales of hay and tree stumps.

14. Tires received at the site shall be stored for transfer offsite to a different disposal facility or altered prior to disposal onsite. Storage and disposal of tires are performed in accordance with applicable State regulations.

15. Any ash accepted at the Facility in accordance with the Discharger’s Conditional Use Permit shall be processed accordingly and moisture-conditioned as necessary to prevent particulate emissions resulting from ash handling.

16. Dead animals shall be disposed of in an appropriately sized hole dug at the active face where the dead animals will be handled in a sanitary manner and covered with a minimum of 2 feet of refuse as they are placed in the fill.

17. During wet weather conditions, the Facility shall be operated and graded to minimize leachate generation.

18. Leachate and/or landfill gas condensate may be returned only to composite lined WMUs listed in Finding 7 of this Order in accordance with Prohibitions A.12 and A.13, Discharge Specifications B.1 and B.32, and Standard Discharge Specifications D.2 through D.4 of the applicable SPRRs and Title 27, section 20705, subdivision (f).

19. Any leachate and landfill gas condensate returned to a composite-lined landfill area shall be 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 or violation of Construction Specifications D.9 through D.12 of this Order.

20. The Discharger shall only discharge liquids to a Class II surface impoundment for which the Discharger has shown through an approved water balance that the addition of such liquids will not violate the special requirements for surface impoundments (Title 27, § 20375) and has also shown that the addition of such liquids are compatible with the containment features and other wastes in the WMU. The Central Valley Water Board Executive Officer can approve discharge of additional wastes to Class II surface impoundments provided the Discharger provides the required information in this specification.

21. Automated pumping systems shall be installed in all leachate sumps and operated to prevent buildup of head on the liner. The depth of leachate in any LCRS sump shall be kept at or below the minimum needed to ensure safe pump operation, but shall be no greater than 30 centimeters (12 inches) unless the Discharger demonstrates that it is infeasible to maintain less than 12 inches in the LCRS sump area. If leachate depths exceed these levels or if liquid is detected in the underlying leak detection layer then the **Discharger shall immediately** notify the Regional Water Board in writing within seven days. Notification shall include a time table for remedial or corrective action necessary to reduce leachate production.

22. The Discharger shall monitor and report the amount of leachate, LFG condensate, and other liquids applied to each WMU in accordance with intent and purposes listed in Title 27, section 21090, subdivision (a)(5)(B) for closed WMUs and Title 27, section 20705 for active and inactive WMUs, in accordance with the MRP No. R5-2018-0007 (incorporated herein).

23. The Discharger may not use any material as alternative daily cover (ADC) that is not listed below as approved ADC in these WDRs unless and until the Discharger has demonstrated that it meets the requirements in Title 27, section 20705, and the Discharger has received written approval that it may begin using the material as ADC.

24. The currently approved ADCs are earthen materials, processed green materials and/or construction demolition waste (which includes processed C&D fines and unders), geosynthetic blankets and tarps, foam products, ash and cement kiln dust, treated auto shredder waste, spray applied cementitious waste, compost, green waste, sludge, contaminated soils, shredded tires, plastic tarps, and non-hazardous sludge materials originating from the treatment of municipal wastewater where the sludge material contains at least 50 percent solids (by weight).

25. The Discharger shall use approved ADC only in internal areas of the landfill that do not drain outside of the limits of the contiguous landfill units unless the Discharger demonstrates that runoff from the particular ADC is not a threat to surface water quality and the demonstration has been approved in writing. This demonstration may take

removal of sediment or suspended solids into account for landfills where surface water drains to a sedimentation basin.

26. Storm water contacting wastes used as ADC or intermediate cover shall be handled and disposed of as leachate, except as allowed under Prohibition A.27.

27. Waste filling at landfill WMUs shall be conducted in accordance with a fill plan demonstrating that all temporary refuse fill slopes will be stable under both static and dynamic conditions for the design event for the unit.

28. All temporary stockpiles of ADC and other wastes shall be stable under both static and dynamic conditions for the design event for the unit.

29. The Discharger shall implement a waste acceptance program including a periodic load checking program to ensure that 'hazardous wastes' are not discharged to any Class II Landfill at the Facility. The program shall also ensure that wastes exceeding moisture limitations are not discharged to Landfill units.

30. The Discharger shall immediately notify the Regional Water Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.

31. Water used for Facility maintenance shall be limited to the minimum amount necessary for dust control, construction and to start the vegetative cover.

32. Landfill leachate and gas condensate used for dust control shall be limited to lined areas of the landfill and shall only be used during the dry season (15 April through 15 October).

33. All LCRS shall convey all leachate that reaches the liner to a sump or other appropriately lined collection area.

34. Precipitation and drainage control systems shall be designed and constructed to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 1,000-year, 24-hour precipitation conditions.

35. MSW landfill units shall not restrict the flow of the 100 year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to pose a hazard to human health and the environment (40 CFR 258.11).

36. The Discharger shall prevent floodwaters from a 100 year flood from contacting wastes in a disposal WMU. As the site is developed, the Discharger shall maintain berms at a minimum of two-feet higher than the January 1997 high water elevations to prevent flood waters from a 100 year flood from entering the site.

37. Landfill gas control measures shall be implemented for a Class II landfill WMU upon the confirmed presence of gas-phase concentrations of one percent (1%) methane or volatile organic compounds (VOCs) at 1.0 parts per million by volume (ppmv) or greater in the leak detection layer or unsaturated zone monitoring points (for laboratory analysis by EPA Method TO-15). The purpose of the confirmation sampling shall be to confirm

the presence of VOCs as opposed to a particular VOC analyte. The gas control measures may or may not be sufficient to prevent the gas-phase migration of VOCs from the Class II WMUs based on corrective action monitoring results.

38. Prior to the discharge of waste to the landfill, all wells within 500 feet of the unit shall have sanitary seals, which meet the requirements of the Yuba County Environmental Management Agency or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Regional Board, the State Department of Water Resources, and to Yuba County Environmental Management Agency.

39. Intermediate cover shall be applied to areas of the landfill where filling is not anticipated within 180 days. Intermediate cover shall consist of one foot of compacted soil with a permeability less than $1x10^{-5}$ cm/sec or an approved engineered alternative. The active disposal area shall be confined to the smallest area practical based on the anticipated quantity of waste discharge.

40. Annually, prior to the anticipated rainy season, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding and to prevent surface drainage from contacting or percolating through wastes.

41. All Class II Landfills shall be designed to withstand the maximum credible earthquake without damage to the foundation, or to the structures, which control leachate, surface drainage, erosion, or gas.

42. The Discharger shall comply with all Standard Discharge Specifications listed in section D of both the Landfill SPRRs and Class II SPRRs, as incorporated herein.

C. FACILITY SPECIFICATIONS

1. The Discharger shall comply with all Standard Facility Specifications listed in section E of both the Landfill SPRRs and Class II SPRRs, as incorporated herein.

2. The Discharger shall immediately notify the Central Valley Water Board of any seeps, fires, flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions that is in violation of these WDRs or could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.

3. Liquid used for Facility maintenance shall be limited to the minimum amount necessary for dust control and construction per Title 27, section 20705, subdivision (f).

4. The Discharger shall maintain in good working order any Facility control system, or monitoring device installed to achieve compliance with these waste discharge requirements and associated monitoring and reporting program.

5. Methane and other landfill gases shall be adequately vented, removed from the Unit, 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.

6. Surface drainage within the waste management Facility shall either be contained on site or be discharged in accordance with applicable storm water regulations.

7. The Discharger shall maintain a Storm Water Pollution Prevention Plan and Monitoring Program and Reporting Requirements in accordance with State Water Resources Control Board's most recent WDRs for Discharges of Storm Water associated with Industrial Activities (currently SWRCB Order No. 2014-0057-DWQ , NPDES No. CAS000001), or retain all storm water on-site.

8. The wood waste coloring operation shall contain all waste within a well-defined footprint including wastewater generated from the wood waste coloring operation.

9. The Discharger shall operate an active landfill gas collection and control system in order to control any release of landfill gas to groundwater, and the unsaturated zone. The landfill gas system shall meet the following specifications:

    a. Landfill gas collection and control systems shall be operated to minimize and control air intrusion and to prevent direct venting of the gas to the atmosphere;

    b. Landfill gas collection and control systems shall be operated so that the methane concentration is less than 500 parts per million above background at the appropriate distance above the surface of the landfill necessary to determine regulatory compliance;

    c. There shall be a sufficient number and spacing of horizontal collectors or vertical gas collection wells to control landfill gas migration and emissions; and

    d. No waste may be placed into new phases until the Discharger has an approved landfill gas monitoring program and the basal waste containment system where waste will be placed is installed.

CLASS II SURFACE IMPOUNDMENT FACILITY SPECIFICATIONS

10. The Discharger shall immediately notify Central Valley Water Board staff by telephone and email and immediately take measures to regain surface impoundment capacity in the event that freeboard levels are equal to or less than 2.7 feet (2.0 feet plus the amount needed to hold the design storm to the nearest tenth of a foot).

11. The Discharger shall record onsite rainfall to track the magnitude of storm events and shall record surface impoundment freeboard levels in accordance with the attached monitoring and reporting program.

12. For Class II surface impoundment(s) used to contain domestic sewage and water treatment sludge the Class II surface impoundment shall meet the following additional specifications:

    a. The proposed sludge storage impoundment(s) in Cell 8A shall be classified as a Class II surface impoundment(s) and be operated as a Class II surface impoundment(s) for temporary storage de-watered sewage sludge and water treatment sludge until clean-closed.

b. The proposed sludge storage impoundment(s) in Cell 8A shall be operated to provide a minimum separation of five feet between waste or leachate and the highest anticipated elevation of underlying groundwater.

c. Contact storm water collected in the proposed surface impoundment(s) LCRS shall be handled and disposed of as liquids managed at landfills in accordance with Title 27 section 20200 subdivision (d).

13. Prior to the wet season and on or before 15 October, the Class II surface impoundment shall have sufficient capacity available to accommodate rainfall during the wet season including the design storm and meet minimum freeboard requirements less monthly evaporation.

14. Leachate removed from a surface impoundment's primary LCRS shall be discharged to the impoundment from which it originated.

15. The **Action Leakage Rate** (ALR) for a Class II surface impoundment containing dewatered sewage and water treatment sludge is **100 gallons per acre per day (gpad)** or 15,000 gallons over a 30-day period for a 5-acre Class II surface impoundment. For Class II surface impoundments containing WMU leachate and gas condensate the action leakage rate is 1000 gpad. If leachate generation in the LCRS of the Class II surface impoundment exceeds the ALR, the Discharger shall:

    a. **Immediately** notify Central Valley Water Board staff by telephone and email.

    b. Submit written notification within **seven days** that includes a time schedule to locate and repair leak(s) in the liner system.

    c. If repairs do not result in a leakage rate less than the required ALR, the Discharger shall submit written notification within **seven days** that includes a time schedule for replacement of the upper liner of the surface impoundment or other action necessary to reduce leachate production.

    d. Complete repairs or liner replacement in accordance with the approved time schedule under "b" and/or "c", above.

16. If liquid is detected in the pan lysimeter of a Class II surface impoundment indicating a leak in the containment structure, the Discharger shall:

    a. **Immediately** notify Central Valley Water Board staff by telephone and email that the containment structure may have failed.

    b. Cease discharging waste into the Class II surface impoundment until a determination is made as to the source of the liquid.

    c. **Immediately** sample and test the liquid in accordance with the unsaturated zone monitoring requirements in MRP No. R5-2018-0007 (incorporated herein).

    d. If the laboratory results indicate that the liquid can be characterized as contents of the Class II surface impoundment, the Discharger must submit written notification

of the release to Central Valley Water Board staff within **seven days** including a time schedule to repair the containment structure(s). Otherwise, the Discharger must submit to Central Valley Water Board staff within **14 days** a report including the laboratory results describing why the source of the liquid is not from the contents of the surface impoundment. The report must describe where the liquid originated from and what corrective action will be taken in the future to prevent the liquid from entering the pan lysimeter.

e. If repairs are necessary, complete repairs of the containment structures in accordance with the approved time schedule.

17. Solids that accumulate in the Class II surface impoundment shall be periodically removed to maintain minimum freeboard requirements and to maintain sufficient capacity for surface impoundment leachate and for the discharge of wastes. Prior to removal of these solids, sufficient samples shall be taken for their characterization and classification pursuant to Article 2, Subchapter 2, Chapter 3, Division 2 of Title 27. The rationale for the sampling protocol used, the results of this sampling, and a rationale for classification of the solids shall be submitted to Central Valley Water Board staff for review. The Discharger shall submit a work plan and schedule to Central Valley Water Board staff at least 90 days prior to removal of the waste that includes the waste characterization and how the Discharger plans to dispose of the sludge and solids.

18. Following sediment/solids removal from the Class II surface impoundment, the liner system shall be inspected for any damage caused by the process of removing the sediment/solids and any damage shall be repaired within 60 days prior to the discharge of additional wastewater. The Discharger shall submit a final report describing the results of the leak testing to Central Valley Water Board staff.

19. No waste shall be discharged into any new surface impoundment until all applicable financial assurances accounts for these WMUs have been properly funded.

20. At no time shall the freeboard of the Class II surface impoundment be less than two feet. The Class II surface impoundment shall be clearly marked to indicate when liquid levels encroach into the two foot minimum freeboard requirement.

21. If the depth of fluid in an LCRS sump exceeds the level where leachate would back up into the drainage layer, then the Discharger shall immediately cease the discharge of waste to the surface impoundment and shall notify the Central Valley Water Board in writing within seven days. Notification shall include a timetable for remedial action to repair the upper liner of the impoundment or other action necessary to reduce leachate production.

BIOSOLIDS MANAGEMENT FACILITY (BMF) SPECIFICATIONS

22. The biosolids Class II surface impoundments and biosolids sludge drying beds (BSDBs) shall be operated and maintained until clean-closed.

23. The biosolids Class II surface impoundments and BSDBs shall be operated to provide a minimum separation of five feet between the base of the BSDBs and the highest anticipated elevation of underlying groundwater.

24. Wastes discharged to the biosolids Class II surface impoundments and BSDBs shall be limited to dewatered sewage from wastewater treatment plants and water treatment sludge.

25. The BSDBs shall only be operated from **16 April through 15 October**. All waste shall be removed from the BSDBs by **15 October** of each year.

26. The quantity of wastes discharged to the BSDBS shall not exceed its drying capacity.

27. Stockpiles of manufactured soil in the BSDBS area or adjacent to WMUs to be constructed shall be winterized to prevent the production of leachate. For WMUs not scheduled for construction that year, the stockpiles are to be winterized prior to the wet season by grading and capping them (with a one-foot layer of clay) for drainage and erosion control or other means to prevent the production of leachate outside of a WMU containment system.

28. Storm water contacting wastes in the BSDBS area shall be handled and disposed of as liquids managed at landfills in accordance with Title 27 section 20200 subdivision (d).

29. The Discharger shall test the biosolids Class II surface impoundment LCRS and the BSDBs gravel drainage layer for clogging in accordance with Title 27 Section 20340(d).

30. The Discharger shall perform an electronic leak survey on the BSDBs geomembrane barrier layer upon completion of construction and periodically thereafter in accordance with MRP R5-2018-0007.

31. The Discharger shall submit a design report and operations plan in accordance with Title 27 Section 21760 for review and approval at least 180 days prior to initiating construction of the BMF.

32. The Discharger shall complete all monitoring associated with the BMF for establishing water quality protection standards in accordance with Title 27 Section 20390 for background water quality in groundwater, the unsaturated zone, and surface waters prior to the discharge of waste to the BMF.

33. The Discharger shall provide financial assurances for clean closure of the BMF (both Class II surface impoundments and BSDBs in accordance with Title 27 Section 21400 and Section 22200.

D. DESIGN AND CONSTRUCTION SPECIFICATIONS

1. The Discharger shall submit for review and approval at least 90 days prior to construction, design plans and specifications for new Units and expansions of existing Units, that include the following:

    a. A Construction Quality Assurance Plan meeting the requirements of Title 27, section 20324;

    b. A geotechnical evaluation of the area soils, evaluating their use as the base layer;

c. An unsaturated zone monitoring system, which is demonstrated to remain effective throughout the active life, closure, and post-closure maintenance periods of the Unit, which shall be installed beneath the composite liner system in accordance with Title 27, section 20415 subdivision (d); and

d. Revised Sample Collection and Analysis Plan incorporating changes to the groundwater detection monitoring system to accommodate the new unit in accordance with Title 27, section 20420.

e. Engineering plans and specifications using the NAVD 88 vertical datum.

2. A minimum separation of 5 feet shall be maintained between wastes or leachate in existing Cells 1, 2A and 2B and the highest anticipated elevation of groundwater including the capillary fringe. A continuous barrier, such as but not limited to a 60-mil HDPE geomembrane or equivalent, shall be installed beneath the entire composite base liner system and side slope liner system in all future cells to create a barrier to groundwater including capillary fringe and to maintain a minimum separation of 2.5 feet between wastes or leachate and groundwater. The barrier shall include means to ensure that any capillary fringe developed due to a leak in the barrier does not violate the 2.5 foot separation requirement.

3. All Class II units and WMUs shall be designed and constructed for a maximum credible earthquake per Title 27, section 20370.

4. Materials used to construct liners and final closure covers shall have appropriate physical and chemical properties to ensure containment of discharged wastes over their operating life.

5. Materials used to construct an LCRS shall have appropriate physical and chemical properties to ensure the required transmission of leachate and gas condensate over the life of the WMU including the post-closure maintenance period.

6. Containment structures and precipitation and drainage control systems shall be constructed and maintained to prevent, to the greatest extent possible, inundation, erosion, slope failure, and washout under 1,000-year, 24-hour precipitation conditions.

7. WMUs shall be designed, constructed and operated to prevent inundation or washout due to flooding events with a 100-year return period.

8. The LCRS shall consist of a permeable layer which covers the bottom of a WMU and side slopes of a WMU. The permeable layer on the bottom shall consist of a granular layer and the permeable layer on the side slopes shall consists of a geocomposite drainage layer.

9. An LCRS (drainage layer) used to limit hydraulic head on an underlying liner in the case of a waste containment liner system, or used to collect and remove leakage in a leak detection system, or used as a means to provide a capillary break behind a groundwater barrier system, shall be designed and constructed with appropriate thickness, hydraulic conductivity, and gradient, to ensure unconfined flow conditions within the LCRS.

10. LCRSs shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate and gas condensate generated by each Class II surface impoundment and/or landfill WMU and to prevent the buildup of hydraulic head on the underlying liner at any time. The LCRS pump shall be capable of removing this volume of fluid and/or 150 percent of the Action Leakage Rate (ALR) flow (ALR applicable to Class II surface impoundments), whichever is greater.

11. The LCRS for each Class II unit shall be operated and maintained to collect twice the anticipated daily volume of leachate and gas condensate generated by the WMU and to prevent the buildup of hydraulic head on the underlying liner at any time.

12. The depth of the fluid in any leachate sump of the Class II units shall be kept at the minimum needed for efficient pump operation (given the pump intake height and cycle frequency), ensure safe pump operation without excessive pump cycling that could damage the pump, and ensure that leachate shall not back up onto the liner system outside of the sump area. The Discharger shall notify the Central Valley Water Board in writing within three days in the event leachate backs up onto the liner system outside of the sump area and shall include a timetable for remedial or corrective action.

13. If monitoring reveals leachate generation such that the depth of fluid on any portion of the LCRS including the LCRS sump exceeds 30 cm (12 inches) (unless the Discharger demonstrates that it is infeasible to maintain less than 12 inches in the LCRS sump area), the Discharger shall immediately notify the Central Valley Water Board in writing within seven days. The notification shall include a timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.

14. The Discharger shall submit a design report including plans, specifications, stability analysis (Title 27, section 20370, subdivision (a)), and a construction quality assurance plan for review and approval prior to constructing any new lined WMU.

15. The Discharger shall submit a final report documenting construction of any new lined WMU for review and approval prior to discharging wastes to the WMU. The final report shall include as-built drawings clearly documenting any changes made during construction that deviated from the design plans and construction plans issued prior to construction. All as built drawings documenting elevations shall be completed using the NAVD 88 vertical datum. The Discharger must also submit an additional technical report as part of its final construction report that certifies that any testing required and any limitations or additional requirements specified in the final closure cover or base and side slope liner's slope stability analysis report was complied with during construction in order to validate the slope stability analysis report assumptions and conclusions.

16. The Discharger shall comply with all Standard Construction Specifications listed in section F of the Landfill SPRRs and section F of the Class II SPRRs, as incorporated herein.

LANDFILL LINER SYSTEM COMPONENTS

17. The Discharger shall construct the base liner of any new Class II landfill units in accordance with the following prescribed engineered alternative liner design to ensure compliance with the minimum 2.5 foot separation requirement between highest

anticipated groundwater which must also take into account a 2.5 foot capillary fringe determined by the Discharger, and bottom of waste containment liner system (lowest point where waste may exist and not be considered a release from the WMU):

a. An engineered alternative composite base liner system that is comprised, in ascending order, of the following:

i. A foundation layer that complies with Title 27, section 20240, subdivision (d) that is of sufficient thickness and comprised of materials that will limit differential settlement;

ii. A subdrain layer or drainage system (capillary break) or equivalent that provides minimum 2.5-foot separation between highest anticipated groundwater including capillary fringe and waste that (1) intercepts Shallow and Regional Zone groundwater seepage,(2) dissipates pore water pressure against the underside of the base and side slope liner system, and (3) maintains long-term stability of the WMU in accordance with Title 27, section 20240, subdivision (c);

iii. A 2.5 foot thick compacted earthen fill or other similar materials to provide minimum groundwater separation if a GCL equivalent layer is used in item iv below. The compacted earthen fill thickness may be reduced to 0.5 feet if a two-foot compacted clay layer is used in item iv below;

iv. Two foot thick compacted clay liner (CCL) with maximum hydraulic conductivity of 1×10^{-7} cm/sec or GCL equivalent layer;

v. A low permeability 60-mil HDPE geomembrane layer (primary liner) that meets the requirements of State Water Board Resolution 93-62;

vi. A geotextile cushion layer of sufficient thickness to protect underlying primary liner if necessary based on Discharger specifications of item viii. below;

vii. 12 inches of gravel drainage layer, or less if demonstrated by Discharger of proper size and type to prevent damage of primary liner, LCRS pipes, and clogging of LCRS over life of WMU;

viii. A geotextile filter layer of sufficient thickness and type to allow leachate migration to the LCRS yet prevent migration of fines from the operations layer material into the LCRS ; and

ix. Operations layer with having minimum hydraulic conductivity of $1x10^{-4}$ cm/sec over the entire area[9] of the base liner to allow leachate to reach the LCRS and also prevent damage due to operational waste placement activities above liner system.

[9] If high permeability "windows" are used in conjunction with a low permeability operations layer material the weighted average hydraulic conductivity over the entire coverage area must meet the minimum hydraulic conductivity requirement of $1x10^{-4}$ cm/sec.

b. An engineered alternative composite **side slope liner system** that is comprised, in ascending order, of the following:

i. A foundation layer that complies with Title 27, section 20240, subdivision (d) that is of sufficient thickness and comprised of materials that will limit differential settlement;

ii. A subdrain layer or drainage system (capillary break) or equivalent that (1) intercepts Shallow and Regional Zone groundwater seepage, (2) dissipates pore water pressure against the underside of the liner system, and (3) maintains long-term stability of the WMU in accordance with Title 27, section 20240, subdivision (c);

iii. A 2.5 foot thick compacted earthen fill or other similar materials to provide minimum groundwater separation if a GCL equivalent layer is used in item iv below. The compacted earthen fill thickness may be reduced to 0.5 feet if a two-foot compacted clay layer is used in item iv below;

iv. Two foot thick compacted clay liner (CCL) with maximum hydraulic conductivity of 1×10^{-7} cm/sec or GCL equivalent layer;

v. A low permeability geomembrane layer that meets the requirements of Resolution 93-62;

vi. An LCRS drainage layer that complies with Title 27, section 20340 and Resolution 93-62; and

vii. An operations layer of sufficient thickness to protect the side slope liner and having minimum hydraulic conductivity of 1×10^{-4} cm/sec over the entire area of the side slope[8] to prevent leachate buildup within the WMU and allow leachate to reach the LCRS.

18. The Discharger shall design, construct, and operate an unsaturated zone along the base and side slopes of the WMU cells with sufficient thickness and appropriate materials to create a capillary break in order to ensure that the approved engineered alternative of 2.5 feet separation between for highest anticipated groundwater including capillary fringe and waste is complied with at all times.

19. The Discharger shall maintain minimum 2.5 foot separation between highest anticipated underlying groundwater below ground surface including capillary fringe and bottom of the LCRS including along the side slopes.

20. The unsaturated zone detection monitoring system i.e., pan lysimeter or other equivalent unsaturated zone monitoring system shall be installed directly below the lowest point in the single composite liner system (LCRS sump).

21. The base grading of any new WMU cell shall incorporate a USEPA Subtitle D Guidelines[10] recommended two percent (minimum one percent) downward post settlement slope towards the leachate collection and removal system (LCRS) sump between all points on the base of each future waste management unit (WMU) cell to ensure proper functionality of its LCRS throughout the life of the WMU. The Discharger shall design the LCRS collection system to ensure sufficient scouring velocity in LCRS collection pipes to prevent clogging or provide effective means to clean out the LCRS collection system pipes.

22. During construction of any new WMU, if seeps or springs are discovered or areas intersecting the bottom or side slopes of the WMU of high permeable geologic materials such as sand or gravel lenses that may cause the Discharger to violate its minimum separation requirement, the Discharger shall survey and document such areas with photographs and other means and report these areas immediately to Central Valley Water Board staff by telephone and email.

23. Each WMU cell as a corrective action for preventing the release of landfill gas and provide gas condensate and leachate control shall have a horizontal gas collection system constructed along the perimeter boundary of the landfill at the crest of the anchor trench, outside the limit of waste, to restrict gas migration from the landfill and to reduce air intrusion into the LFG system. The horizontal piping shall be connected to the site's gas control and collection system (GCCS) to recover LFG from the perimeter. Gas condensate and leachate control shall be performed by construction of a geomembrane barrier flap or equivalent welded to the primary geomembrane liner of the WMU as the crest of the anchor trench as shown in Golder Associates' *Perimeter GCCS Expansion Details* drawing dated 3 September 2013.

24. If GCL is used as a liner component the GCL shall be placed such that the Discharger provides a minimum one-foot minimum overlap between panels on the base, one-foot minimum overlap on the side slopes, and one-foot minimum overlap at the end of roll seams.

25. If a gravel type LCRS blanket is used the Discharger shall submit design calculations or meaningful laboratory tests and liner specifications for future phases based on gravel size, gravel characteristics (e.g., rounded, subrounded, angular, etc.), and static loads (final waste heights) and dynamic loads (construction operations) that will ensure that the primary geomembrane is not damaged by the drainage layer throughout the life of the WMU. The design calculations or meaningful laboratory tests shall also take into consideration additional stress placed on the primary geomembrane due to specification of a drainage layer thickness of less than one-foot thick. The Discharger shall demonstrate through laboratory testing that the proposed gravel type LCRS blanket if less than one-foot thick will not cause unacceptable damage to the primary geomembrane liner under expected static and dynamic loads during the life of the WMU.

26. The LCRS shall be designed and operated to function without clogging throughout the life of the WMU. Each phase of construction of the WMU shall be equipped with

[10] USEPA Solid Waste Disposal Facility Criteria Technical Manual, EPA530-R-93-017, Section 4.3.3 Pages 165-167; USEPA Seminar Publication, Design, Operation, and Closure of Municipal Solid Waste Landfills, EPA/625/R-94/008, Section 3.4.2.

dedicated features e.g., piping to allow injection liquid into the LCRS drainage material in an area that most represents the LCRS drainage material condition in order to facilitate annual testing of the LCRS drainage material to demonstrate proper operation as required by section 20340, subdivision (d) of Title 27. An LCRS test shall be performed on any new WMU prior to placement of waste to establish baseline operational performance of the LCRS drainage layer to which future annual LCRS tests will be compared.

27. Each LCRS shall be designed and operated to be free draining and at no time shall the LCRS be allowed to become a pressurized conduit.

28. Each unit's LCRS sumps shall be equipped with automated pumps. The Discharger shall maintain and implement an O&M plan to ensure that the LCRS and pumps are operating properly. The O&M plan shall be kept in the Facility office. The leachate volume removed from each LCRS sump shall be daily recorded and accumulated volume removed shall be calculated on a monthly basis.

CLASS II SURFACE IMPOUNDMENT LINER SYSTEM

29. The Class II surface impoundment liner system shall consists of, from the top down:

    a. Operation Layer of sufficient thickness to protect underlying primary liner;

    b. A primary 60-mil HDPE geomembrane;

    c. A geocomposite geonet drainage layer as a Leachate Collection and Removal System (LCRS);

    d. A secondary 60-mil HDPE geomembrane;

    e. An unsaturated zone detection monitoring system i.e., pan lysimeter or other equivalent unsaturated zone monitoring system installed directly below the lowest point in the liner system i.e., LCRS sump and in direct communication with the unsaturated zone; and

    f. A minimum 1-foot thick low permeability foundation layer (k less than or equal to 1 x 10-6 cm/sec) suitable for providing a stable base for the overlying secondary geomembrane that will not damage the geomembrane over the life of the surface impoundment.

BIOSOLIDS SLUDGE DRYING BEDS LINER SYSTEM

30. The biosolids sludge drying beds liner system shall consist of, from the top down:

    a. Minimum 2-feet thick operations soil;

    b. A geotextile filter with gravel or geocomposite geonet drainage layer as a Leachate Collection and Removal System (LCRS);

    c. A primary 60-mil HDPE geomembrane barrier layer;

d. f. An unsaturated zone detection monitoring system i.e., a sufficient number of pan lysimeters or other equivalent unsaturated zone monitoring system installed directly below the liner system and in direct communication with the unsaturated zone; and

e. A low permeability foundation layer (k less than or equal to 1 x 10^{-6} cm/sec) of sufficient thickness and suitable for providing a stable base

31. The design, construction, operation, maintenance, and monitoring requirements associated with Class II surface impoundments in these WDRs and MRP applies also applies to BSDBs.

32. The Discharger shall include design features that protect the primary geomembrane from damage due to amongst other things wind uplift, maintenance procedures such as solids removal, ultraviolet radiation degradation, etc. for the entire useful life of the surface impoundment.

33. The Class II surface impoundment shall be designed and constructed to have capacity for wastewater flows to the impoundment, precipitation from a 100-year wet season of 46.3 inches distributed at least monthly, a 1,000-year, 24-hour storm event (design storm) of 8.12 inches, and shall maintain at least two (2.0) feet of freeboard at all times. To ensure compliance with this requirement, the Discharger shall maintain at least 2.7 feet (2.0 feet plus the amount needed to hold the design storm to the nearest tenth of a foot) of freeboard at all times except in the event of a storm equal to or exceeding the 1,000-year 24-hour design storm event in which case at least two (2.0) feet of freeboard must be maintained.

34. The Discharger shall perform a detailed water balance for any new surface impoundment or existing leachate and gas condensate storage system (Class II surface impoundment or above ground tank system) whenever a new cell is made operational to receive waste to demonstrate that the proposed design and construction has sufficient storage capacity to comply with Title 27, section 20375. The water balance at a minimum must take the following factors into account on a monthly basis:

a. The average influent leachate and landfill gas condensate flow on a monthly basis;

b. Evaporation losses from the impoundment distributed monthly;

c. Authorized discharges from the impoundment for dust control, disposal via exportation, storage in auxiliary above ground tanks, etc.;

d. Loss of storage capacity due to operations layer, solids accumulation, etc.

e. The 100-year wet season (46.3 inches) is distributed monthly in accordance with average monthly rainfall patterns used to determine leachate and landfill gas condensate production discharged to a Class II surface impoundment that **will** be returned to a solid waste landfill WMU for dust control purposes;

f. The 100-year wet season (46.3 inches) is distributed monthly in accordance with average monthly rainfall patterns used to determine wastewater production at the

Facility and other liquid wastes discharged to a Class II surface impoundment that **will not** be returned to a solid waste landfill WMU;

g. The evaporative surface area of the impoundment based on wastewater elevation in the pond for each month;

h. The total surface area of the site runoff area captured and conveyed to the impoundment (for Class II surface impoundments not discharging to the solid waste landfill WMUs);

i. The design storm event capacity that needs to be maintained to capture design storm runoff conveyed to the impoundment (for Class II surface impoundments not discharging to the solid waste landfill WMUs);

j. The design storm capacity for rainfall into the surface impoundment; and

k. Additional capacity necessary to maintain the minimum two-foot freeboard requirement.

35. The surface impoundment(s) shall be designed, constructed and maintained to prevent scouring and/or erosion of the liners and other containment features at points of discharge to the impoundments and by wave action at the water line.

36. Any direct-line discharge to the surface impoundment shall have fail-safe equipment or operating procedures that include daily inspection and manual control of pumping systems during the wet weather season to prevent overfilling.

37. The surface impoundment bottom slope shall have a minimum one percent post settlement slope throughout and shall be graded to provide positive drainage of LCRS leachate to the leachate sump and ensure unconfined leachate flow in the LCRS drainage layer and proper venting of any landfill gas that may form in the LCRS or below the secondary geomembrane liner.

38. The LCRS for the Class II surface impoundment shall be designed, operated, and maintained to collect twice the anticipated daily volume of leachate generated by the WMU and to prevent the buildup of hydraulic head on the underlying liner at any time. The depth of fluid in the LCRS sump shall be kept at the minimum needed to ensure efficient pump operation and shall not exceed one foot head at any time on the secondary liner.

39. The LCRS shall be designed and operated to function without clogging through the scheduled closure of the surface impoundment. The surface impoundment shall be equipped with dedicated features e.g., piping to allow injection liquid into the LCRS drainage material to facilitate annual testing of the LCRS drainage material to demonstrate proper operation as required by section 20340, subdivision (d) of Title 27. An LCRS test shall be performed on any new surface impoundment prior to placement of waste to establish baseline operational performance of the LCRS drainage layer to which future annual LCRS tests will be compared.

40. The depth of the fluid in the leachate sump of the Class II surface impoundment shall be kept at the minimum needed for efficient pump operation (given the pump intake height and cycle frequency), and leachate shall not back up onto the secondary liner system outside of the sump area.

41. Leachate generation within a surface impoundment LCRS shall not exceed 85% of the design capacity of (a) the LCRS, or (b) the sump pump. If leachate generation exceeds this value and/or if the depth of the fluid in an LCRS exceeds the minimum needed for safe pump operation, then the Discharger shall immediately cease the discharge of waste (including leachate) to the impoundment and shall notify the Central Valley Water Board in writing within seven days. Notification shall include a timetable for a remedial action to repair the upper liner of the impoundment or other action necessary to reduce leachate production.

42. The LCRS for the Class II surface impoundment shall be designed and constructed to transmit twice the maximum Action Leakage Rate (ALR) of 100 gallons per acre per day (gpad) or less under unconfined flow conditions taking into account LCRS transmissivity reduction factors due to clogging of the LCRS over the life of the Class II surface impoundment.

43. The Class II surface impoundment shall have a sump to collect and return leachate to the impoundment that leaks through the primary liner. The sump shall include a dedicated automated pump to remove leachate and return it to the impoundment. The sump and pumping system shall be designed and constructed such that in the case of a pump failure the Discharger has sufficient time to repair/replace the pump and still comply with the requirement to limit head on the secondary liner to one foot.

44. The Class II surface impoundment shall be designed and constructed to have a flow totalizer operational at all times that measures leachate volumes pumped from the LCRS sump in order to determine leakage rates and compliance with the ALR.

45. The Class II surface impoundment shall be designed and constructed to have an unsaturated zone monitoring system consisting of a pan lysimeter beneath the entire sump area of the impoundment.

46. The Class II surface impoundment shall have permanent markings on the liner, or a permanent freeboard gauge so that the freeboard can be observed and recorded at any time. The markings or gauge shall have increments no greater than one vertical inch.

47. As the Discharger proposes to construct additional WMU cells the Discharger shall submit a revised water balance analysis report for review and approval that demonstrates that the existing leachate and gas condensate storage capacity either through the use of tanks and/or Class II surface impoundment(s) has sufficient storage capacity to contain the liquid waste and continue to maintain sufficient freeboard in accordance with Title 27, section 20375. The Discharger shall not discharge waste from the additional WMU cell(s) to the tanks and/or Class II surface impoundment until the report has been approved by the Executive Officer.

48. The Discharger shall not proceed with liner or final closure cover construction including earth moving and grading in preparation for the base liner or final closure cover

construction until the construction plans, specifications, and all applicable construction quality assurance plans have been approved.

49. A disinterested third party independent of both the Discharger and the construction contractor shall perform all construction quality assurance monitoring and testing during the construction of any liner or final closure cover system.

50. Following the completion of construction of a liner or final closure cover system or portion of a liner or final closure cover system, and prior to discharge of waste onto the newly constructed liner system, the final documentation required in Title 27 CCR section 20324(d)(1)(C) shall be submitted for review and approval. The report shall be certified by a registered civil engineer or a certified engineering geologist. It shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, and with the prescriptive standards and performance goals of Title 27.

51. The Discharger may propose changes to the liner or final closure cover system design prior to construction, provided that approved components are not eliminated, the engineering properties of the components are not substantially reduced, and the proposed liner system results in the protection of water quality equal to or greater than the design prescribed by Title 27 and this Order. The proposed changes may be made following written approval by the Executive Officer. Substantive changes to the design require reevaluation as an engineered alternative and approval by the Central Valley Water Board in revised WDRs.

52. The Discharger shall comply with all Standard Construction Specifications listed in section F of both the Landfill SPRRs and Class II SPRRs, incorporated herein.

53. The Discharger shall comply with all Storm Water Provisions listed in section L of both the Landfill SPRRs and Class II SPRRs, both of which as incorporated herein.

E. CLOSURE AND POST-CLOSURE MAINTENANCE SPECIFICATIONS

1. The Discharger shall submit a final or partial final closure and post-closure maintenance plan at least two years prior to proposed closure of any portion of the landfill in accordance with requirements in section G of the Standard Closure and Post-Closure Specifications in the applicable SPRRs.

2. The Discharger shall install a final closure cover over a landfill WMU that meets the following minimum prescriptive standards (from bottom upwards):

    a. A minimum two-foot thick foundation layer that complies with Title 27, section 21090, subdivision (a)(1), and is comprised of materials that will not damage the overlying barrier layer;

    b. A two-foot thick compacted clay liner (CCL) with maximum hydraulic conductivity of 1×10^{-7} cm/sec or GCL equivalent barrier layer that meets the requirements of State Water Board Resolution 93-62, and Title 27, section 21090, subdivision (a)(2);

c. A low permeability 60-mil HDPE or 40-mil LLDPE geomembrane barrier layer that meets the requirements of State Water Board Resolution 93-62 and Title 27, section 21090, subdivision (a)(2) (items b and c satisfy requirement for a low-hydraulic-conductivity barrier layer and meet the equivalency requirements of the bottom liner system);

d. A drainage layer that limits hydraulic head on the liner system and provides slope stability (reduce soil pore liquid pressure); and

e. An erosion resistant layer that complies with Title 27, section 21090, subdivision (a)(3).

3. The Discharger shall close landfill units with a final cover as proposed in the Preliminary Closure and Postclosure Maintenance Plan (PCPCMP) submitted as part of the 2017 JTD and as approved by this Order. The components of the approved final cover as proposed in the PCPCMP are listed in Finding 164 through 166.

4. Any final closure cover over a WMU shall be designed and constructed to reduce soil pore gas pressures below the closure over barrier layer that may cause final cover slope instability throughout the postclosure maintenance period.

5. The Discharger shall obtain revised WDRs prior to closure with any other final cover design than the design or designs approved in this Order, except when modifications are necessary for problematic areas of the final cover needing repair so long as the barrier layer (e.g., geomembrane, GCL, and/or compacted clay layer) remains intact, continues to satisfy slope stability requirements, does not degrade the ability of the final closure cover to meet original design and performance specifications, and the modifications are approved by Central Valley Water Board staff.

6. Vegetation shall be planted and maintained over each closed landfill WMU. Vegetation shall be selected to require a minimum of irrigation and maintenance and shall have a rooting depth not in excess of the vegetative layer thickness.

7. During closure, sufficient erosion and sedimentation controls shall be installed to prevent erosion of the cover material before vegetation and be established and to prevent excessive sediment in storm water runoff.

8. The WMU slopes shall not exceed a horizontal-to-vertical ratio of 3:1 (not including benching) to ensure slope stability. Other 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.

9. The closed landfill shall have 20-foot wide benches at least every 50 vertical feet. The maximum height for the closed Facility, including final cover, is 365 feet MSL (see Finding No. 86).

10. The WMU final slopes shall not be less than five percent grade to accommodate post closure settlement and to prevent ponding and infiltration.

11. All final cover slopes shall be designed and constructed to withstand an MCE event as required under Title 27, section 21750(f)(5).

12. The waiting period for installation of the final cover shall not exceed five years after the date a portion of the landfill reaches final elevation, as specified under "Prompt Incremental Closure," Title 27, section 21090(b)(1)(D).

13. Upon termination of the dewatered sewage sludge operations, the Class II surface impoundment(s) shall be clean closed. After clean closure, the surface impoundments may be re-built as part of a Class II landfill WMU (Cell 8A) and may be used for disposal operations.

14. The Discharger shall install an active landfill gas extraction system for the closed landfill unit during landfill closure, and landfill gas shall be extracted from closed landfill units until such time that the landfill gas is no longer a threat to water quality as documented by the Discharger and approved by the Executive Officer.

15. The Discharger shall seal the edges of the final cover by connecting the cover geomembrane to the liner geomembrane.

16. The Discharger shall test the critical interfaces of the final closure cover in a laboratory to ensure minimum design shear strengths are achieved and include the results in the final documentation report and also demonstrate and certify that any testing required and any limitations or additional requirements specified in the final closure cover's slope stability analysis report was complied with during construction in order to validate the slope stability analysis report conclusions.

17. The Discharger shall ensure that the vegetative/erosion resistant layer receives necessary seed, binder, and nutrients to establish the vegetation proposed in the final closure plan. The Discharger shall install necessary erosion and sedimentation controls to prevent erosion and sediment in runoff from the closed landfill during the period the vegetation is being established.

18. At closure of any Class II surface impoundment, the Discharger shall clean-close the unit pursuant to Title 27, section 21400, subdivision (b)(1). All precipitates, settled solids, liner materials, and adjacent natural geologic materials contaminated by wastes shall be completely removed and discharged to an appropriately permitted landfill Facility. If after reasonable attempts to remove contaminated natural geologic materials, the Discharger demonstrates that removal of all remaining contamination is infeasible, the impoundment shall be closed as a landfill pursuant to Title 27, section 21400, subdivision (b)(2)(A). In this event, the Discharger shall backfill and grade the area and submit a revised Final Closure and Post-Closure Maintenance Plan proposing a final cover meeting the requirements of Title 27, section 21090 and shall perform all post-closure maintenance in the approved Post-Closure Maintenance Plan.

19. Prior to closure, the Discharger shall submit a Final Closure and Post-Closure Maintenance Plan prepared by a California-registered civil engineer or certified engineering geologist, and that contains all applicable information required in Title 27, section 21769. The plan shall include any closure/post-closure elements proposed in the ROWD, and shall meet the requirements of this Order.

20. The Discharger shall comply with 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 Landfill SPRRs and the Class II SPRRs, incorporated herein.

F. FINANCIAL ASSURANCE SPECIFICATIONS

1. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for closure and post-closure maintenance for the WMUs in at least the amounts of Findings 104 through 105, adjusted for inflation annually and shall be revised according to the approved PCPMP required by these WDRs in Provisions section H. A report regarding financial assurances for closure and 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 or Central Valley Water Board staff 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 preliminary closure and post-closure maintenance plan (PCPCMP) any time there is a change that will increase the amount of the closure and/or post-closure maintenance cost estimate. The updated PCPCMP shall be submitted to the Central Valley Water Board, the Local Enforcement Agency, and CalRecycle. The PCPCMP shall meet the requirements of Title 27, section 21769, subdivision (b), and include a lump sum estimate of the cost of carrying out all actions necessary to close each Unit, to prepare detailed design specifications, to develop the final closure and post-closure maintenance plan, and to carry out the first 30 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 and Class II surface impoundment in at least the amount of the annual inflation-adjusted cost estimate of Findings 106 through 107 and shall be revised according to the approved PCPMP required by these WDRs in Provisions section H. 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 or Central Valley Water Board staff 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 both the Landfill SPRRs and Class II SPRRs, as incorporated herein.

G. MONITORING SPECIFICATIONS

5. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with MRP

No. R5-2018-0007, and the Standard Monitoring Specifications listed in section I of Landfill SPRRs and Class II SPRRs, incorporated herein.

6. All reporting of vertical elevations shall be reported using the NAVD 88 vertical datum.

7. 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. R5-2018-0007, and the Standard Monitoring Specifications listed in section I of Landfill SPRRs and Class II SPRRs, incorporated herein.

8. The Discharger shall comply with the Water Quality Protection Standard (WQPS) as specified in this Order, MRP No. R5-2018-0007, and the Landfill SPRRs and Class II SPRRs, as incorporated herein.

9. The Discharger shall report current concentration limits for groundwater, unsaturated zone, and surface water with each monitoring report and provide comparison with monitoring results and evaluate whether the monitoring results exceed the current concentration limits.

10. A pan lysimeter shall be installed beneath the LCRS sump for each new landfill cell/WMU for the purpose of unsaturated zone monitoring. If the new landfill WMU cell does not have an LCRS sump the Discharger will install an appropriate number of landfill gas probes and or lysimeters beneath the base of the new landfill and along the edge of the containment system to monitor soil pore gas and soil pore liquid in the unsaturated zone.

11. Groundwater monitoring wells and wells used only for monitoring groundwater elevation that have monitoring devices installed in them that are capable of daily monitoring groundwater elevation shall daily monitor and record groundwater elevation and report the results on a semiannual basis. Such monitoring devices shall only be removed for (1) allowing groundwater sampling of the well; and (2) maintenance, repair or replacement.

12. The Discharger shall provide daily monitoring of surface water elevation in Best Slough as a corrective action measure so long as the Discharger is addressing groundwater separation violations between waste in a WMU and highest anticipated groundwater including capillary fringe.

13. The landfill will be filled in phases; sufficient groundwater detection monitoring well(s) and sufficient unsaturated zone monitoring devices shall be installed at the downgradient edge of each phase of cell construction and other locations as deemed necessary. As a result, the footprint of the WMU will expand over time. The Discharger must develop and implement a plan in accordance with Title 27, section 21760, subdivision (a)(3) that will ensure there will be sufficient groundwater monitoring wells and unsaturated zone monitoring devices at the downgradient edge of the waste throughout the life of the Facility. The Discharger shall establish WQPS for any new WMU cell prior to discharger of waste to said WMU cell.

14. The Discharger shall monitor groundwater, the unsaturated zone, and surface water associated with each phase of cell construction. Sampling shall be collected as close to

edge of waste as possible for each phase of construction in order to provide representative samples for each monitoring medium.

15. Unsaturated zone monitoring systems shall be capable of measuring both saturated (soil pore liquids or leachate) and unsaturated (soil pore gas or landfill gas) COC concentrations that may exist as a result of a release from the WMU.

16. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined by Title 27, § 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. R5-2018-0007 (incorporated herein).

17. 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. R5-2018-0007 and section I (Standard Monitoring Specifications) in both the Landfill SPRRs and Class II SPRRs, as incorporated herein.

18. As specified in MRP No. R5-2018-0007, the Discharger shall enter all reports and monitoring data including but not limited to laboratory analysis results, boring logs, well completion reports, groundwater elevation readings, etc. into the online Geotracker database as required by Division 3 of Title 27 and Chapter 30, Division 3 of Title 23.

19. The Discharger as part of its Sampling and Analysis plan shall include a schedule for inspecting, calibrating, and testing its groundwater, unsaturated zone, landfill gas, and surface water monitoring systems e.g., meters, pressure transmitters and transducers, gauges, sensors, sampling pumps, etc. to ensure that they are and will function reliably, and provide accurate and repeatable results.

20. The Discharger shall evaluate as part of its Corrective Action Monitoring Program the effectiveness of its corrective action program and provide as part of its reporting requirements an estimate as to when the Discharger will achieve full compliance.

21. The Discharger shall add any confirmed COCs detected during its five-year monitoring schedule using Tables VI of MRP No. R5-2018-0007 to Table V for detection monitoring purposes.

22. The Discharger shall provide Regional Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation, repair, or abandonment of monitoring devices, and a minimum 48 hour notification prior to the collection of samples associated with a detection monitoring program, evaluation monitoring program, or corrective action program.

23. Any new, repaired, or replaced monitoring device installed to determine compliance with these WDRs shall begin sampling for the parameters listed in the tables of MRP No. R5-2018-0007 for the applicable media being monitored (e.g., groundwater, unsaturated zone, surface waters, etc.) within 72 hours of determining that the monitoring device is fully functional. The Discharger shall also increase monitoring frequency at the new, repaired, and/or replaced monitoring device such that the Discharger can establish baseline water and/or gas quality characteristics within one year at the monitoring point

that is representative and captures seasonal fluctuations at the monitoring device. Installation of monitoring devices for monitoring new WMUs shall occur at least one year prior to placement of waste in the new WMU such that the Discharger can establish baseline water and/or gas quality characteristics at each new monitoring point that are representative of seasonal fluctuations at the monitoring device.

24. The Discharger shall comply with all Standard Monitoring Specifications and Response to a Release specifications listed in sections I and J of both the Landfill SPRRs and Class II SPRRs, as incorporated herein.

H. PROVISIONS

1. The Discharger shall maintain at the Facility copies of: (a) this Order; (b) MRP No. R5-2018-0007; (c) Landfill SPRRs; and (d) Class II SPRRs. These materials shall be available at all times to Facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

2. A copy of all documents submitted to the Central Valley Water Board shall be maintained in the Facility's operating record.

3. The Discharger shall comply with all applicable provisions of Title 27 and Subtitle D (40 C.F.R. part 258) not specifically referred to in this Order.

4. The Discharger shall comply with MRP No. R5-2018-0007 (incorporated herein).

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 December 2015 for landfills and SPRRs dated April 2016 for Class II surface impoundments, 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, and shall be prepared under the direction of, and certified by a registered professional (i.e. a California-registered Civil Engineer or Certified Engineering Geologist) competent to take responsible charge over the required report.

8. The Discharger shall possess and maintain a post-earthquake inspection plan at the Facility which shall include inspecting liners and covers; LCRS riser pipes, sump pump operation, and storage tanks; landfill gas flares; drainage control facilities; and detection monitoring facilities for damage following an earthquake of Magnitude (M) 5.0 or greater within 25 miles of the Facility or a M6.0 or greater earthquake within 50 miles of the Facility.

9. The Discharger shall conduct an earthquake inspection in a timely manner following earthquakes of the magnitude as specified in Provision 8 above. A report of the

inspection shall be submitted within 30 days after the inspection assessing any damage and shall contain proposals to repair or replace any damaged structures or facilities.

10. The Discharger shall complete the tasks contained in these waste discharge requirements and submit the following reports pursuant to Water Code section 13267 in accordance with the following time schedule:

Task	Compliance Date
a. Complete the following items:	**See Below**
i. Revised Base Grading Design. These revised WDRs require the Discharger to grade the base of future WMU cells with a two percent downward post settlement slope towards the leachate collection and removal system (LCRS) sump between all points on the base of each future waste management unit (WMU) cell to ensure proper functionality of its LCRS throughout the life of the WMU. If the Discharger proposes a post settlement slope of less than two percent but not less than one percent towards the leachate collection and removal system (LCRS) sump between all points on the base the Discharger shall submit a Technical Report which supports a post settlement slope of greater than one percent but less than two percent. The Discharger's Technical Report will take into consideration the hydraulic conductivity of the operations layer, use and placement of gravel windows, distance between leachate collection pipes, maximum 30 cm (12 inches) head on primary liner, minimum scouring flow velocity required in LCRS pipes or other means to ensure LCRS pipes remain clean, differential settlement that could occur unevenly along lateral flow lines, the uncertainty in estimating differential settlement based on limited geologic information, etc.	**1 February 2019**

ii.	**Technical Report addressing Groundwater Separation and Minimum Base Slope.** The Discharger shall submit a Technical Report which includes a work plan for review and approval which adequately describes how the Discharger will maintain the approved engineered alternative of 2.5 feet separation distance between highest anticipated/observed groundwater including capillary fringe and waste along the base and side slopes of existing WMU cells. The Technical Report shall also include a revised WMU base and side slope liner design or other means for future WMU cells that ensures an unsaturated zone of sufficient thickness and of appropriate materials exists to provide a capillary break such that the Discharger is able to comply with the approved engineered alternative of 2.5 feet separation distance between highest anticipated/observed groundwater including capillary fringe and waste along the base and side slopes of existing WMU cells. The revised WMU base and side slope liner design shall also include a recommended two percent (minimum one percent) downward post settlement slope towards the leachate collection and removal system (LCRS) sump between all points on the base of each future waste management unit (WMU) cell to ensure proper functionality of its LCRS throughout the life of the WMU.	**1 September 2018**
iii.	**Stability Analysis Report Certification.** The Discharger shall submit a technical report that certifies the stability of the landfill WMU(s) in accordance with Title 27 section 21750 subdivision (f)(5) due to saturated soil conditions adjacent to the landfill WMU. The certification shall consider evaluating stresses and associated strain within the geosynthetic components of the containment system for failure due to any displacement along the base and side slopes due to static and dynamic conditions. The certification shall state whether the WMU(s) comply with Title 27 requirements for stability of the WMUs throughout the WMUs life, closure period, and postclosure maintenance period.	**1 May 2018**
iv.	**Technical Report Describing Potential Enhancements to Current Corrective Action for Landfill Gas Related Release of VOCs.** The Discharger shall submit a Technical Report including a work plan to assess how the Discharger shall enhance its current corrective action program in order to control and eliminate the release of landfill gas related VOCs beyond the groundwater and unsaturated zone points of compliance.	**1 May 2018**

v. Water Balance Analysis Report. The Discharger shall submit a Water Balance Analysis Report for review and approval that determines the amount of storage capacity on site necessary to contain at the beginning of the wet season (15 October) leachate and gas condensate. Containment capacity must consider amongst other things, gas condensate and leachate production from a 100-year wet season including storage capacity for the 1000-year design storm, and maintain the necessary freeboard to operate safely above ground storage tanks or minimum 2-feet of freeboard in a Class II surface impoundment.	**1 July 2018** and hereafter in July prior to the onset of the wet season (15 October) whenever the Discharger constructs a new WMU cell which will increase the amount of leachate and gas condensate needing to be contained.
vi. Surface Water Detection Monitoring Work plan. The Discharger shall submit a work plan to assess background surface water quality if available as well as surface water quality entering, leaving, and within its sedimentation basins. The Discharger shall include the monitoring points in its sampling and analysis plan and WQPS.	**1 June 2018**
vii. Evaluation of Stormwater Sedimentation Basins effects on Detection Monitoring System and Groundwater Separation. Discharger shall submit a work plan to investigate whether stormwater collection, conveyance, and storage at and around the facility is inhibiting the Discharger from collecting representative unsaturated zone and groundwater samples for detection water quality monitoring program and/or causing the Discharger to violate the Facility's groundwater separation requirements. The work plan shall include investigation of any hydraulic communication between the sedimentation basins and Shallow and Regional Zone groundwater including Best Slough.	**1 June 2018**

viii. Updated Site Conceptual Model. The Discharger shall submit a work plan to assess the site conceptual model for groundwater. The assessment of the site conceptual model shall include but not limited to: (1) the vertical and lateral extent of groundwater in the Shallow Zone surrounding WMU; (2) identify all areas of highest hydraulic conductivity that should be monitored within the Shallow Zone; (3) the extent of the basal layer that exists between the Shallow Zone and the Regional Zone; (4) the permeability of the basal layer; (5) water sources that recharge the Shallow Zone; and (5) the period of time when perched groundwater exists in the Shallow Zone taking into account the amount of water coming from its sources i.e., timing and amount of precipitation received during the wet season The work plan shall also provide an evaluation of all DMP wells and certify the DMP meets the intent of Title 27. The evaluation shall also include cross-sections defining the groundwater zone a particular well is monitoring.	**1 October 2018**
ix. Final Closure Cover Design Report. The Discharger submit a final cover design that complies with Title 27 section 21090 subdivision (a) and meets the equivalency requirement of subdivision (a)(2) for the through-flow rate of the bottom liner system.	**1 September 2018**

b. Complete the following items:

i. **Per item a.ii,** the Discharger shall implement the approved the work plan that describes how the Discharger will maintain the approved engineered alternative of 2.5 feet separation distance between highest anticipated/observed groundwater including capillary fringe and waste along the base and side slopes of existing WMU Cells.	**90 days after approval**
ii. **Per item a.iv,** the Discharger shall implement the approved work plan that enhances its current corrective action program in order to eliminate the release of landfill gas related VOCs beyond the groundwater and unsaturated zone points of compliance	**120 days after approval excluding weather delays**

iii.	**Per item a.v,** the Discharger shall certify that prior to the beginning of each wet season (15 October) the Discharger has sufficient storage capacity onsite for leachate and gas condensate containment. The Discharger must take into consideration its limited ability to discharge leachate and gas condensate to a WMU for dust control purposes during the wet season and logistics involved in arranging and transporting a surge in leachate production offsite for disposal.	**30 days prior to the beginning of each wet season (15 October).**
iv.	**Per item a.vii,** the Discharger upon approval of the Work Plan shall implement the Work Plan to determine if the location of the sedimentation basins are causing artificial recharge of Shallow and Regional Zone groundwater and prolonging conditions where the Discharger is violating its groundwater separation requirements along the side slopes and base of WMU 1. Upon completion of implementation of the Work Plan the Discharger shall submit a technical report by **1 January 2020** summarizing the results and providing any recommendations if necessary to correct impacts from the sedimentation basins on the Discharger's detection monitoring system and separation requirements.	**15 October 2018 through 15 October 2019**
v.	**Per item a.viii,** the Discharger upon approval of the Work Plan shall implement the Work Plan such that the Discharger's Detection Monitoring Program complies with Title 27 requirements for detection monitoring wells.	**90 days after approval excluding weather delays**

c. Operations Layer Borrow Source Characterization — **1 June 2018**

Submit a technical report that characterizes the hydraulic conductivity of the operations layer borrow source used for future landfill cells to ensure it has sufficient hydraulic conductivity to not inhibit leachate from reaching the LCRS system. If the hydraulic conductivity is less than $1x10^{-4}$ cm/sec the Discharger shall determine the percentage of area using high permeability "windows" such that the weighted average hydraulic conductivity is minimum $1x10^{-4}$ cm/sec. The Discharger shall also determine the placement of such high permeability "windows" and proper sizing of underlying LCRS conveyance pipes to manage increased volume of leachate from these high permeability "windows."

d. Revised WQPS and sampling and analysis plan. The Discharger shall submit a revised WQPS and sampling and analysis plan for review and approval that complies with Title 27, sections 20385 through 20435 that addresses the concerns identified in Findings 63 and 90.	**1 June 2019**
e. Construction Plans	
Submit construction and design plans for review and approval. (See all Construction Specifications in section D, above and section F of the applicable SPRRs.)	**90 days prior to proposed construction**
f. Construction Report	
Submit a construction report for review and approval upon completion demonstrating construction was in accordance with approved construction plans (see Standard Construction Specifications in section F of the applicable SPRRs). The Discharger must also submit an additional technical report as part of its final construction report demonstrates and certifies that any testing required and any limitations or additional requirements specified in the final closure cover or base liner's slope stability analysis report was complied with during construction in order to validate the slope stability analysis report conclusions.	**60 days prior to proposed discharge**
g. Final Closure Plan	
Submit a final or partial final closure and post-closure maintenance plan, design plans, and CQA plan for review and approval (see all Closure and Post-Closure Specifications in section E, above and section G of the applicable SPRRs).	**Two years prior to closure**

11. The Discharger shall comply with all General Provisions listed in section K of both the Landfill SPRRs and Class II SPRRs, as incorporated herein.

12. The Central Valley Water Board has converted to a paperless office system. All project correspondence and reports required under this Order shall therefore be submitted electronically rather than in paper form, as follows:

13. All technical reports and monitoring reports required under this Order shall be converted to PDF and uploaded via internet to the State Water Board's GeoTracker database at http://geotracker.waterboards.ca.gov, as specified in California Code of Regulations, title 23, section 3892, subdivision (d) and section 3893. Project-associated analytical data shall be similarly uploaded to the GeoTracker database in an appropriate format specified under this Order under a site-specific global identification number. Information on the GeoTracker database is provided at:

http://www.swrcb.ca.gov/ust/electronic_submittal/index.shtm

Notification of the Geotracker upload shall be emailed to the Central Valley Water Board at: centralvalleysacramento@waterboards.ca.gov. To ensure that the submittal is routed to the appropriate staff as quickly as possible, the following information shall be included in the body of the email:

Attention:	Title 27 Compliance & Enforcement Unit
Report Title	
Geotracker Upload ID	
Discharger name:	Recology Ostrom Road
Facility name:	Recology Ostrom Road Landfill
County:	Yuba
CIWQS place ID:	246287

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 1 February 2018.

Original signed by Assistant Executive Officer for

PAMELA C. CREEDON, Executive Officer

VKJ/RDB

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2018-0007
FOR
RECOLOGY OSTROM ROAD
RECOLOGY OSTROM ROAD LANDFILL
CLASS II LANDFILL
CLASS II SURFACE IMPOUNDMENTS
BIOSOLIDS SLUDGE DRYIING BEDS
CONSTRUCTION, OPERATION, CLOSURE,
POST-CLOSURE MAINTENANCE AND CORRECTIVE ACTION
YUBA COUNTY

This monitoring and reporting program (MRP) is issued pursuant to Water Code section 13267, and incorporates requirements for groundwater, unsaturated zone, leachate, gas condensate, and surface water monitoring and reporting; facility monitoring, maintenance, and reporting; corrective action monitoring and reporting; and financial assurances reporting contained in California Code of Regulations, title 27 (Title 27), section 20005 et seq., Waste Discharge Requirements (WDRs) Order R5-2018-0007, and the Standard Provisions and Reporting Requirements for Landfills dated January 2012 (Landfill SPRRs) and Standard Provisions and Reporting Requirements for Class II Surface Impoundments dated April 2016 (Class II SPRRs). 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

Recology Ostrom Road (Discharger) shall comply with the monitoring program provisions of Title 27 for groundwater, surface water, leachate (waste characterization), gas condensate, and the unsaturated zone in accordance with Section I (Standard Monitoring Specifications) of the applicable SPRRs and Section G (Monitoring Specifications) of the WDRs. All monitoring shall be conducted in accordance with the most current approved *Sample Collection and Analysis Plan*, which includes quality assurance/quality control standards.

All compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the Water Quality Protection Standard (WQPS). All detection monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, leachate, 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.

Any new, repaired, or replaced monitoring device installed to determine compliance with these WDRs shall begin sampling for the parameters listed in the tables for the applicable media being monitored (e.g., groundwater, unsaturated zone, surface waters, etc.) within 72 hours of determining that the monitoring device is fully functional. The Discharger shall also increase monitoring frequency at the monitoring device such that the Discharger can establish baseline water and/or gas quality characteristics within one year at the monitoring point that is representative and captures seasonal fluctuations at the monitoring device. Installation of monitoring devices for monitoring new WMUs shall occur at least one year

prior to placement of waste in the new WMU such that the Discharger can establish baseline water and/or gas quality characteristics at each new monitoring point that are representative of seasonal fluctuations at the monitoring device and are not affected by a release.

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:

Section	Monitoring Program
A.1	Groundwater Monitoring
A.2	Unsaturated Zone Monitoring (gas probes, lysimeters, leak detection system, and dry groundwater monitoring wells)
A.3	Leachate and Landfill Gas Condensate, Leak Detection System, , Seep, and Class II Surface Impoundment and/or Above Ground Tanks Monitoring, and Annual LCRS Testing
A.4	Surface Water Monitoring (including springs)
A.5	Facility Monitoring
A.6	Dewatered Sewage and Water Treatment Sludge Monitoring
A.7	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, Subchapter 3 “Water Monitoring”. The detection monitoring system shall be certified by a California-licensed professional civil engineer or licensed professional geologist as meeting the requirements of Title 27. The current Shallow Zone groundwater detection monitoring system **will be assessed to determine if it meets** the applicable requirements of Title 27 as described in WDRs Order R5-2018-0007. The current Regional Zone groundwater detection monitoring system **meets** the applicable requirements of Title 27. The Discharger shall revise the groundwater detection monitoring system (after review and approval by Central Valley Water Board staff) as needed each time a new landfill cell or module is constructed.

The current groundwater monitoring network shall consist of the following:

Well	Status[1]	Water Bearing Zone Being Monitored	Units Being Monitored
MW-1	Background	Regional	Not Applicable
VZW-1	Background	Shallow	Not Applicable
VZW-2	Background	Shallow	Not Applicable
MW-2	Detection	Regional	WMU 1, Cell 3A
MW-2S	Detection	Regional	WMU 1, Cell 3A
MW-3	Detection	Regional	WMU 1, Cell 3B
MW-4	Corrective Action	Regional	WMU 1

Well	Status[1]	Water Bearing Zone Being Monitored	Units Being Monitored
MW-4S	Corrective Action	Regional	WMU 1
MW-5	Detection	Regional	WMU 1, Cells 1A,2A
MW-5S	Detection	Regional	WMU 1, Cells 1A,2A
MW-6	Corrective Action	Regional	WMU 1
MW-6S	Corrective Action	Regional	WMU 1
MW-7	Detection	Regional	WMU 1, Cells 2A,3A
MW-7S	Detection	Regional	WMU 1, Cells 2A,3A
MW-8	Detection	Regional	WMU 1
MW-8S	Detection	Regional	WMU 1
MW-16	Detection	Regional	WMU 1, Cells 1B,2B
MW-16S	Detection	Regional	WMU 1, Cells 1B,2B
MW-17	Corrective Action	Regional	WMU 1
MW-18	Corrective Action	Regional	WMU 1
MW-19	Corrective Action	Regional	WMU 1
MW-20	Corrective Action	Regional	WMU 1
T-1	Detection	Regional	WMU 1
T-1S	Detection	Regional	WMU 1
T-2	Corrective Action	Regional	WMU 1
T-2S	Corrective Action	Regional	WMU 1
T-3	Detection	Regional	WMU 1
T-4	Corrective Action	Regional	WMU 1
PZ-9	Detection	Shallow	WMU 1B
PZ-11	Corrective Action	Shallow	WMU 1, Cell 2A, 3A
PZ-12	Corrective Action	Shallow	WMU 1, Cell 2A, 3A
PZ-13	Corrective Action	Shallow	WMU 1, Cell 2A, 3A
VZW-T1	Detection	Shallow	WMU 1
VZW-T2	Detection	Shallow	WMU 1
VZW-T3	Detection	Shallow	WMU 1
VZW-4	Corrective Action	Shallow	WMU 1
VZW-T4	Corrective Action	Shallow	WMU 1
VZW-5	Detection	Shallow	WMU 1
VZW-6	Corrective Action	Shallow	WMU 1
VZW-8	Detection	Shallow	WMU 1
VZW-16	Detection	Shallow	WMU 1
VZW-17	Corrective Action	Shallow	WMU 1
VZW-18	Corrective Action	Shallow	WMU 1
VZW-19	Corrective Action	Shallow	WMU 1
VZW-20	Corrective Action	Shallow	WMU 1

[1]Monitoring wells in corrective action shall return to detection monitoring status upon completion of the corrective action program where the point of compliance water quality returns to at or below the water quality protection standards i.e., concentration limits. Any monitoring well in detection monitoring that enters a corrective action program shall be monitored at the accelerated frequency shown in section A.7.

Groundwater samples shall be collected from the background wells, detection monitoring wells, evaluation and corrective action monitoring wells (if any), 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. Also, refer to section A.7 for any additional requirements or accelerated monitoring frequencies for corrective action monitoring wells. 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, determine groundwater flow direction, and estimate groundwater flow rates in the uppermost aquifer (Regional Zone) and in any zones of perched water (Shallow Zone) and in any additional portions of the zone of saturation monitored. Groundwater monitoring wells and wells used only for monitoring groundwater elevation that have monitoring devices installed in them that are capable of daily monitoring groundwater elevation shall daily monitor and record groundwater elevation and report the results on a semiannual basis. Such monitoring devices shall only be removed for (1) allowing groundwater sampling of the well; and (2) maintenance, repair or replacement.

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, subdivision (e)(15). All groundwater elevations shall be reported using only one common datum i.e., NAVD88 for the entire network. The Discharger shall include the results of monitoring surface water elevation of Best Slough SW-2 monitoring point on the groundwater elevation graphs. The Discharger shall provide a map which includes groundwater elevations showing the potentiometric groundwater surface using all groundwater monitoring points as well as showing groundwater elevation including capillary fringe relative to the bottom of the LCRS along the base and side slopes and make a determination whether the Discharger has maintained minimum separation between the waste and the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored including the capillary fringe as required in WDRs Order No. R5-2018-0007. The data shall be reported in the following format as part of the semiannual report.

Cell	Base of waste elevation[1] (0.1 Ft NAVD 88)	Calculated groundwater elevation[2] (0.1 Ft NAVD 88)	WDR groundwater and side slope separation requirement (0.1 Ft)	Calculated Separation[3] between waste and groundwater (0.1 Ft)	Compliance with groundwater separation requirements (Y/N)
Regional Groundwater Zone (Shallow Zone)					
1A	97.3				
1B	92.4				
2A	98.6				
2B	97.8				
3A	102.2				
3B	101.8				
Future Cells	TBD				
Shallow Groundwater Zone (Regional Zone)					
1A	97.3				

Cell	Base of waste elevation[1] (0.1 Ft NAVD 88)	Calculated groundwater elevation[2] (0.1 Ft NAVD 88)	WDR groundwater and side slope separation requirement (0.1 Ft)	Calculated Separation[3] between waste and groundwater (0.1 Ft)	Compliance with groundwater separation requirements (Y/N)
1B	92.4				
2A	98.6				
2B	97.8				
3A	102.2				
3B	101.8				
Future Cells	TBD				

[1] Base of waste elevation for evaluating regional groundwater zone for an existing single composite lined WMU cell shall be the lowest point in the LCRS sump. For a double lined WMU cell with a leak detection system the lowest base elevation shall be the lowest point in the leak detection system.

[2] The calculated groundwater elevation is the groundwater elevation including capillary fringe of 2.5 feet calculated directly below the lowest base of waste in the LCRS for the regional groundwater zone (Regional Zone) and calculated groundwater elevation is the groundwater elevation including capillary fringe calculated directly adjacent the side slopes for the shallow groundwater zone (Shallow Zone).

[3] The calculated separation between the lowest base of waste location and calculated groundwater elevation for the regional groundwater zone (Regional Zone) is the vertical distance between the two points. The calculated separation between waste and groundwater elevation and calculated groundwater elevation for the shallow groundwater zone (Shallow Zone) is the shortest horizontal distance between groundwater elevation up to the calculated groundwater elevation and waste within the LCRS placed along the side slope of the WMU cell.

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 December 2016 and shall be monitored again in **2021**. The results shall be reported in the Annual Monitoring Report for the year in which the samples were collected.

2. Unsaturated Zone Monitoring (Gas Probes, lysimeters, leak detection system, and dry groundwater monitoring wells)

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. The current unsaturated zone detection monitoring system **meets** the applicable requirements of Title 27. The Discharger shall collect, preserve, and transport all unsaturated zone samples in accordance with the quality assurance/quality control standards contained in the most recently approved Sample Collection and Analysis Plan.

All monitoring results for the unsaturated zone shall be included in monitoring reports and shall include an evaluation of potential impacts of the facility on the unsaturated zone for soil-pore liquid and/or soil-pore gas.

The Discharger shall install unsaturated zone monitoring devices (after review and approval by Central Valley Water Board staff) each time the landfill constructs a new cell or module.

The current unsaturated zone monitoring network shall consist of:

Mon Pt.	Status[2]	Units Being Monitored
VZ-1	Background	Not Applicable
VZ-2	Corrective Action	WMU 1, Cell 1A
PL-1A	Corrective Action	WMU 1, Cell 1A (Pan Lysimeter)
PL-1B	Corrective Action	WMU 1, Cell 1B (Pan Lysimeter)
PL-2A	Corrective Action	WMU 1, Cell 2A (Pan Lysimeter)
PL-2B	Detection	WMU 1, Cell 2B (Pan Lysimeter)
PL-3A	Corrective Action	WMU 1, Cell 3A (Pan Lysimeter)
PL-3B	Corrective Action	WMU 1, Cell 3B (Pan Lysimeter)
LD-1B	Detection	WMU 1, Cell 1-B Leak Detection
LD-2B	Detection	WMU 1, Cell 2-B Leak Detection
LD-2C	Detection	WMU 1, Cell 2-B Leak Detection
LD-3A	Detection	WMU 1, Cell 3-A Leak Detection
LD-3B	Detection	WMU 1, Cell 3-B Leak Detection
MW-3[1]	Detection	WMU 1, Cell 3B
PZ-9[1]	Detection	WMU 1, Cell 1B
PZ-11[1]	Corrective Action	WMU 1, Cell 2A, 3A
PZ-12[1]	Corrective Action	WMU 1, Cell 2A, 3A
PZ-13[1]	Corrective Action	WMU 1, Cell 1A, 2A
VZW-T1[1]	Detection	WMU 1
VZW-T2[1]	Detection	WMU 1
VZW-T3[1]	Detection	WMU 1
VZW-4[1]	Corrective Action	WMU 1
VZW-T4[1]	Corrective Action	WMU 1
VZW-5[1]	Detection	WMU 1
VZW-6[1]	Corrective Action	WMU 1
VZW-8[1]	Detection	WMU 1
VZW-16[1]	Detection	WMU 1
VZW-17[1]	Corrective Action	WMU 1
VZW-18[1]	Corrective Action	WMU 1
VZW-19[1]	Corrective Action	WMU 1
VZW-20[1]	Corrective Action	WMU 1
GP-1S/D	Corrective Action	WMU 1, Cell 1A
GP-2S/D	Corrective Action	WMU 1, Cell 1A
GP-3S/D	Corrective Action	WMU 1, Cell 2A
GP-4S/D	Corrective Action	WMU 1, Cell 1B
GP-5S/D	Detection	WMU 1, Cell 2B
GP-6S/D	Detection	WMU 1, Cell 3A
GP-7S/D	Detection	WMU 1, Cell 3A
GP-8S/D	Detection	WMU 1, Cell 3B
GP-9S/D	Detection	WMU 1, Cell 3B
GP-10S/D	Detection	WMU 1, Cell 3B
GP-11S/D	Corrective Action	WMU 1
GP-12S/D	Corrective Action	WMU 1

[1] Groundwater monitoring well to be sampled for soil-pore gas when reported as dry i.e., unable to obtain groundwater sample.

[2]Unsaturated zone monitoring points in corrective action shall return to detection monitoring status upon completion of the corrective action program where the point of compliance monitoring parameter(s) returns to at or below the water quality protection standards i.e., concentration limits. Any unsaturated zone monitoring point in detection monitoring that enters a corrective action program shall be monitored at the accelerated frequency shown in section A.7.

Unsaturated zone samples shall be collected from the monitoring network listed above and shall be analyzed for the parameters and constituents listed in Table II in accordance with the specified methods and frequencies. Groundwater monitoring wells listed in the table above with insufficient groundwater for water sample collection shall be monitored for soil pore gas. If methane exceeds 1% or total VOCs exceed 1 ppmv, the monitoring well shall be sampled for analysis of landfill gas constituents and associated VOC constituents per EPA method TO-15. Pan lysimeters shall be inspected for the presence of liquid **monthly**. Also, refer to section A.7 for any additional requirements or accelerated monitoring frequencies for corrective action monitoring at unsaturated zone monitoring devices. If liquid is detected in a previously dry pan lysimeter, the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the liquid for the Field and Monitoring Parameters listed in Table II. Samples collected for the 5-year COC analyses specified in Table II shall be collected and analyzed in accordance with the methods listed in Table VI every five years; beginning again in **December 2021** (does not include soil-pore gas).

The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the approved Sample Collection and Analysis Plan.

Monitoring results for the unsaturated zone shall be included in monitoring reports and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

3. Leachate and Landfill Gas Condensate, Leak Detection System, Seep, and Class II Surface Impoundment and/or Above Ground Tanks Monitoring , and Annual LCRS Testing

a. **Leachate and Leak Detection System Monitoring**

The Discharger shall operate and maintain the leachate collection and removal system(s) (LCRS), the LCRS sumps, the leak detection system, and conduct monitoring of the aforementioned as well as any detected leachate seeps. The Discharger shall conduct annual testing of each LCRS in accordance with Title 27 and this monitoring program.

The current primary LCRS and leak detection system monitoring points are:

Monitoring Point	Unit Where Monitoring Point is Located
Sump-1A	WMU 1, Cell 1-A LCRS
Sump-1B	WMU 1, Cell 1-B LCRS
Sump-2A	WMU 1, Cell 2-A LCRS
Sump-2B	WMU 1, Cell 2-B LCRS
Sump-3A	WMU 1, Cell 3-A LCRS

Monitoring Point	Unit Where Monitoring Point is Located
Sump-3B	WMU 1, Cell 3-B LCRS
LD-1B	WMU 1, Cell 1-B Leak Detection System
LD-2B	WMU 1, Cell 2-B Leak Detection System
LD-2C	WMU 1, Cell 2-B Leak Detection System
LD-3A	WMU 1, Cell 3-A Leak Detection System
LD-3B	WMU 1, Cell 3-B Leak Detection System

All LCRS sumps and leak detection sumps shall be inspected monthly for the presence of leachate, and leachate flow and monthly volume shall be measured and recorded in accordance with Table III. If leachate is detected in a previously dry sump, the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the leachate for Field and Monitoring Parameters listed in Table III. Leachate in the LCRS sump or leak detection system shall then be sampled for all parameters and constituents in accordance with the frequencies listed in Table III whenever liquid are present. All LCRS sump and leak detection system samples shall be analyzed for the five-year COCs specified in Table III every five years, beginning again in **December 2021**.

Any confirmed COCs detected during its five-year monitoring schedule using Table VI shall be added to Table V for detection monitoring purposes.

In the event that hydraulic head on the LCRS sump primary liner exceeds one-foot the Discharger shall immediately notify Central Valley Water Board staff by telephone and email, and immediately take measures to minimize head on the LCRS sump primary liner.

b. 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 MRP Section B.j, below. During construction of any new WMU, if seeps or springs are discovered or areas intersecting the bottom or side slopes of the WMU of high permeable geologic materials such as sand or gravel lenses that may cause the Discharger to violate its minimum separation requirement, the Discharger shall survey and document such areas with photographs and other means and report these areas immediately to Central Valley Water Board staff by telephone and email.

c. Annual LCRS Testing

All LCRSs shall be tested annually pursuant to Title 27, section 20340, subdivision (d) to demonstrate proper operation and functionality of the LCRS drainage layer. The Discharger shall perform test(s) to determine degradation i.e., clogging of the LCRS drainage layer. The results of these tests shall be reported to the Central Valley Water Board in the Annual Monitoring Report and shall include comparisons with earlier tests made under comparable conditions. An LCRS test shall be performed on any new WMU prior to placement of waste to establish baseline

operational performance of the LCRS drainage layer to which future annual LCRS tests will be compared.

d. Landfill Gas Condensate Monitoring

The Discharger shall operate and maintain a LFG condensate collection and removal system, and conduct monitoring and reporting of the quantity and quality of the gas condensate collected.

The Discharger shall sample and analyze for the Field and Monitoring Parameters listed in Table III landfill gas condensate collected from all WMUs where landfill gas condensate is to be returned to the WMU. The quantity of landfill gas condensate returned to a WMU shall be measured and reported separately for each WMU as Landfill Gas Condensate Flow Rate (in gallons/month). Reporting for landfill gas condensate shall be conducted as required in Section B.1 of this MRP below.

e. Class II Surface Impoundment and/or Above Ground Tanks Monitoring

Samples shall be collected from each Class II surface impoundment and/or above ground tanks in accordance with the Table III. One sample shall be collected from each surface impoundment or a representative above ground tank during each semi-annual monitoring period. The following additional parameters will be monitored and reported as part of the semiannual reporting requirement:

Additional Class II Surface Impoundment and/or Above Ground Tanks Monitoring			
Field Parameters	**Units**	**Monitoring Frequency**	**Reporting Frequency**
Flow Rate to each impoundment or above ground tank system[1]	gallons/month	Weekly	Semiannually
Reapplication Flow Rate to each landfill WMU[5]	gallons/month	Daily	Semiannually
Precipitation[2]	Inches & Tenths/month	Daily	Semiannually
Freeboard[3]	Feet & Tenths	Monthly	Semiannually
Off Site Removal of Wastewater[4]	Gallons per Event	Daily	Semiannually

[1] Flow of wastewater into Class II surface impoundments or each above ground tank system as measured and recorded at totalizing meter. A system of tanks are tanks that are interconnected with one inlet for adding wastewater and one outlet for discharging

wastewater. The Discharger is prohibited from discharging liquids other than landfill leachate or landfill gas condensate the Discharger to an impoundment of tank system used for such liquids. The Discharger shall report the flowrate of all other liquids to a surface impoundment dedicated to other liquids separately.

[2] Precipitation shall be measured as described in Discharge Specifications.

[3] Freeboard shall be measured and recorded monthly and prior to major storm events using permanent markings on the primary geomembrane liner or a free-standing gauge. Freeboard in an above ground tank system is the available volume of capacity remaining compared to volume necessary to safely operate the tank system without overflow.

[4] Each time wastewater is removed from the facility for disposal elsewhere, the Discharger shall document the date of removal, gallons removed, and the location of disposal. A copy of each hauling receipt shall be included in the semiannual report.

[5] The Discharger shall monitor the flowrate to each landfill WMU. The Discharger is prohibited from discharging quantities of liquids to landfill WMUs greater than the amount of landfill leachate and landfill gas condensate permitted to be returned to the landfill WMUs.

Action Leakage Rate: The Discharger shall calculate the leakage rate for each Class II surface impoundment LCRS on a monthly basis, and convert the results into gallons per acre per day value. The results shall be included in the information in the semiannual reports, and compared to the Action Leakage Rates found in WDRs R5-2018-0007 under Facility Specification C.15. If monitoring of the flow rate into the LCRS shows an exceedance of the Action Leakage Rate required by the WDRs, the Discharger shall follow the procedures in the WDRs under "C. Facility Specifications". Tabulated leakage rates shall be included in the semiannual monitoring reports.

For any Class II surface impoundment that exists at the Facility the Discharger shall conduct monitoring of its LCRS and the surface impoundment's contents in accordance with Table III and immediately notify Central Valley Water Board staff by telephone and email and immediately take measures to regain surface impoundment capacity in the event that freeboard levels are equal to or less than the minimum freeboard requirement (2.0 feet plus the amount needed to hold the design storm to the nearest tenth of a foot).

The Discharger shall perform an Annual LCRS Rest per section A.3.c above for each Class II surface impoundment LCRS to determine whether the LCRS is clogging..

f. Wood Waste Coloring Operation.

The Discharger shall sample and analyze for the Field and Monitoring Parameters listed in Table III any leachate discharged from the wood waste coloring operation's well defined footprint. Reporting for landfill gas condensate shall be conducted as required in Section B.1 of this MRP below.

4. Surface Water Monitoring (including springs)

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 or where unauthorized discharges from a WMU enters surface waters. The monitoring system shall comply with the applicable provisions of Title 27, sections 20415 and 20420. At the Recology Ostrom Road Landfill, runoff from landfill areas flows to two sedimentation basins that periodically discharge to Best Slough, a tributary of the Feather River. The current surface water detection monitoring system **does not meet** the applicable requirements of Title 27 because the Discharger is not currently

monitoring surface water quality at sedimentation basin #1 and sedimentation basin #2. Section H (Provisions) of WDRs Order No. R5-2018-0007 requires the Discharger to monitor surface water quality at the sedimentation basins.

The current and future surface water monitoring points for the landfill are:

Monitoring Point	Status
SW-1	Upgradient background water quality in Best Slough
SW-2	Best Slough Surface Water Elevation[1]
SW-3	Downgradient water quality in Best Slough
SB-1	Influent into Sedimentation Basin #1 (future)
SB-2	Water quality in Sedimentation Basin #1 (future)
SB-3	Effluent from Sedimentation Basin #1 (future)
SB-4	Influent into Sedimentation Basin #2 (future)
SB-5	Water quality in Sedimentation Basin #2 (future)
SB-6	Effluent from Sedimentation Basin #2 (future)

The Discharger shall provide daily monitoring of surface water elevation in Best Slough as a corrective action measure so long as the Discharger is addressing groundwater separation violations between waste in a WMU and highest anticipated groundwater including capillary fringe.

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 five-year COCs specified in Table IV every five years, beginning again in **December 2021** when surface water is present and flowing into the sedimentation basins.

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 perform 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 annual report shall include a winter assessment of the biosolids sludge drying beds (BSDBs) area including stockpiles of manufactured soil to minimize the production of leachate during the wet season. The Discharger shall submit documentation demonstrating that all wastes have been removed from the BSDBs by 15 October. 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 by 15 November of each year, as required in MRP Section B.4.

[1] The Discharger shall monitor the surface water elevation daily and report the results on a semiannual basis. The Discharger shall include the surface water elevation of Best Slough on the groundwater elevation graphs required in Section A.1

b. **Major Storm Events**

The Discharger shall record onsite rainfall to track the magnitude of 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. 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 MRP Section B.5.

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

For closed landfill 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, § 21090, subds. (e)(1)-(2).) Reporting shall be in accordance with MRP Section B.6. The Discharger shall prepare an iso-settlement survey map upon completion of any final closure cover to be used as a baseline for determining any differential settlement using any future iso-settlement surveys.

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:

Landfill Unit Type	Frequency	Season
Active	Weekly	Wet: 1 October to 30 April
Active	Monthly	Dry: 1 May to 30 September
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 units:

   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 units:

   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 including weekly field sheets documenting operations during the wet season shall be submitted in the semiannual monitoring reports required in MRP Section B.1.

6. Dewatered Sewage and Water Treatment Sludge Monitoring

a. Biosolids Class II surface impoundments containing dewatered sewage and water treatment sludge shall be monitored and monitoring results reported in accordance with Section A.3.e above.

b. The monitoring of dewatered sewage and water treatment sludge` discharged to Class II surface impoundment(s), BSDBs, and WMUs shall be monitored in accordance to the parameters and frequency specified in Table VIII. The Discharger shall certify that all waste shall be removed from the BSDBs by 15 October each year.

c. Pan lysimeters and/or other unsaturated zone monitoring devices associated with the biosolids Class II surface impoundments and biosolids sludge drying beds shall be monitored on a quarterly basis and monitoring results reported in accordance with Section A.2 above.

d. Groundwater monitoring associated with the biosolids Class II surface impoundments and biosolids sludge drying beds shall be monitored on a quarterly basis and monitoring results reported in accordance with Section A.1 above.

e. Annual testing of the biosolids Class II surface impoundment LCRS and the BSDBs gravel drainage layer for clogging shall be tested and reported in accordance with Section A.3.c above.

f. The Discharger shall perform an electronic leak survey on the BSDBs geomembrane barrier layer upon completion of construction and after one year of operation of the BSDBs. If the results of the BSDBs electronic leak survey show no damage to the geomembrane barrier layer, the Discharger may perform the electronic leak survey every third year thereafter. The Discharger shall make repairs to any damage identified and retest the area to ensure that the repair was performed successfully. If damage was identified after the first year of operation the Discharger shall perform annual electronic leak surveys on the BSDS. A disinterested third party independent of both the Discharger, construction contractor, and construction quality assurance firm shall perform the electronic leak survey.

7. 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 and unsaturated zone monitoring points that are in

a corrective action monitoring program shall be monitored in accordance with the groundwater and unsaturated zone monitoring requirements in MRP parts A.1 and A.2, except as modified in this part for any additional constituents or accelerated monitored frequencies The Discharger shall continue to monitor in accordance with this section until the corrective action program has been successfully completed.

a. Groundwater Evaluation/Corrective Action Monitoring

The Discharger shall monitor the following evaluation/corrective action monitoring well as required in part A.1 and Table I of this MRP, with the following additional constituents, and the following alternative sampling frequency for all Field and Monitoring Parameters listed in Table I:

Well	Unit Monitored	Additional Constituents	Sampling Frequency
MW-4	WMU 1	None	Quarterly
MW-4S	WMU 1	None	Quarterly
VZW-4	WMU 1	None	Quarterly
VZW-T4	WMU 1	None	Quarterly
T-4	WMU 1	None	Quarterly
MW-6	WMU 1	None	Quarterly
MW-6S	WMU 1	None	Quarterly
VZW-6	WMU 1	None	Quarterly
MW-17	WMU 1	None	Quarterly
VZW-17	WMU 1	None	Quarterly
MW-18	WMU 1	None	Quarterly
VZW-18	WMU 1	None	Quarterly
MW-19	WMU 1	None	Quarterly
VZW-19	WMU 1	None	Quarterly
MW-20	WMU 1	None	Quarterly
VZW-20	WMU 1	None	Quarterly
T-2	WMU 1	None	Quarterly
T-2S	WMU 1	None	Quarterly
PZ-11	WMU 1, Cells 2A,3A	None	Quarterly
PZ-12	WMU 1, Cells 2A,3A	None	Quarterly
PZ-13	WMU 1, Cells 2A,3A	None	Quarterly

b. Unsaturated Zone Corrective Action

i. The Discharger shall monitor the following groundwater monitoring points or approved alternative groundwater monitoring points as required in part A.2 and Table II of this MRP that are in corrective action for soil-pore gas that do not yield enough soil-pore liquid for laboratory analysis i.e., reported as “dry”, including any following additional constituents, and the following alternative sampling frequency for all Field and Monitoring Parameters listed in Table II:

Soil-Pore Gas Monitoring Point	Unit Monitored	Additional Constituents	Sampling Frequency
PZ-11	WMU 1, Cells 2A	None	Quarterly
PZ-12	WMU 1, Cells 2A	None	Quarterly
PZ-13	WMU 1, Cells 2A	None	Quarterly
VZW-4	WMU 1	None	Quarterly
VZW-T4	WMU 1	None	Quarterly
VZW-6	WMU 1	None	Quarterly
VZW-17	WMU 1	None	Quarterly
VZW-18	WMU 1	None	Quarterly
VZW-19	WMU 1	None	Quarterly
VZW-20	WMU 1	None	Quarterly

ii. The Discharger shall monitor the following unsaturated zone monitoring points or approved alternative monitoring points as required in part A.2 and Table II of this MRP, including any following additional constituents, and the following alternative sampling frequency for all Field and Monitoring Parameters listed in Table II:

Lysimeter	Unit Monitored	Additional Constituents	Sampling Frequency
VZ-2	WMU 1, Cell 1A	None	Monthly
PL-1A	WMU 1, Cell 1A	None	Monthly
PL-1B	WMU 1, Cell 1B	None	Monthly
PL-2A	WMU 1, Cell 2A	None	Monthly
PL-3A	WMU 1, Cell 3A	None	Monthly
PL-3B	WMU 1, Cell 3B	None	Monthly

iii. The Discharger shall monitor the following LCRS monitoring points or approved alternative monitoring points for landfill gas in accordance with this section, including any following additional constituents, and the following alternative sampling frequency :

Lysimeter	Unit Monitored	Constituent	Sampling Frequency
Sump-1A	WMU 1, Cell 1-A LCRS	LFG pressure	Monthly
Sump-1B	WMU 1, Cell 1-B LCRS	LFG pressure	Monthly
Sump-2A	WMU 1, Cell 2-A LCRS	LFG pressure	Monthly
Sump-2B	WMU 1, Cell 2-B LCRS	LFG pressure	Monthly
Sump-3A	WMU 1, Cell 3-A LCRS	LFG pressure	Monthly
Sump-3B	WMU 1, Cell 3-B LCRS	LFG pressure	Monthly

iv. The Discharger shall monitor the following unsaturated zone monitoring points as required in part A.2 and Table VII of this MRP, including any following additional constituents, and the following alternative sampling frequency for all Field and Monitoring Parameters listed in Table VII:

Gas Probe	Unit Monitored	Additional Constituents	Sampling Frequency
GP-1S/D	WMU 1, Cell 1A	None	Quarterly
GP-2S/D	WMU 1, Cell 1A	None	Quarterly
GP-3S/D	WMU 1, Cell 2A	None	Quarterly
GP-4S/D	WMU 1, Cell 1B	None	Quarterly
GP-11S/D	WMU 1	None	Quarterly
GP-12S/D	WMU 1	None	Quarterly

v. The Discharger shall submit the tabulated results of monthly unsaturated zone monitoring beneath the WMU as part of its semiannual reports. If the monitoring results detect any methane or VOCs in the unsaturated zone, or any other monitoring parameters indicative of a release of leachate or landfill gas from the WMU, the Discharger shall submit a work plan within 90 days of detection of the release for review and approval for corrective action to prevent or remediate the release of leachate and/or landfill gas from the WMU.

c. **Landfill Gas Extraction Corrective Action System**

The Discharger shall monitor the LFG Control System, LFG Control System influent, and following landfill gas extraction wells per Table VII of this MRP, using the following sampling frequency for all Monitoring Parameters listed in Table VII to determine the effectiveness of the corrective action for the release of VOCs from WMU 1 attributed to landfill gas:

Gas Extraction Wells	Sampling Frequency
PEW-1 through PEW-13	Monthly
EW-1 through EW-5	Monthly
EW-11	Monthly
EW-12	Monthly
EW-19	Monthly

The Discharger shall submit the tabulated results per Table VII as part of its semiannual reports. The report shall include an evaluation of the landfill gas extraction system, its effectiveness in preventing the release of VOCs beyond the points of compliance and any improvements that must be made to the landfill gas extraction system to complete corrective action within the estimated corrective action time period.

d. **Hydraulic Head on LCRS Sump Primary Liner, Pan Lysimeters, Leak Detection Sumps, and liquid removed from each monitoring point**

The Discharger shall monitor the following monitoring points as required in part to determine compliance with the maximum allowable hydraulic head on the LCRS sump primary liner of 1-foot as well as groundwater separation

requirements. The Discharger shall monitor hydraulic head on the liner of the pan lysimeters (Pan) and leak detection sumps (LDS) to evaluate whether the Discharger has maintained the required separation between highest anticipated groundwater elevation including capillary fringe and waste. The Discharger shall also monitor and report the amount of liquid removed on a weekly basis from each monitoring point in order to quantify the amount of liquid present at these monitoring points during the specified times of the year.

Monitoring Point	Unit Monitored	Monitoring Parameter	Monitoring Frequency
Sump-1A	WMU 1, Cell 1-A LCRS	See Note 2	Weekly[1]
Sump-1B	WMU 1, Cell 1-B LCRS	See Note 2	Weekly[1]
Sump-2A	WMU 1, Cell 2-A LCRS	See Note 2	Weekly[1]
Sump-2B	WMU 1, Cell 2-B LCRS	See Note 2	Weekly[1]
Sump-3A	WMU 1, Cell 3-A LCRS	See Note 2	Weekly[1]
Sump-3B	WMU 1, Cell 3-B LCRS	See Note 2	Weekly[1]
PL-1B	WMU 1, Cell 1B Pan	See Note 2	Weekly[3]
PL-2A	WMU 1, Cell 2A Pan	See Note 2	Weekly[3]
PL-2B	WMU 1, Cell 2B Pan	See Note 2	Weekly[3]
PL-3A	WMU 1, Cell 3A Pan	See Note 2	Weekly[3]
PL-3B	WMU 1, Cell 3B Pan	See Note 2	Weekly[3]
LD-1B	WMU 1, Cell 1-B LDS	See Note 2	Weekly[3]
LD-2B	WMU 1, Cell 2-B LDS	See Note 2	Weekly[3]
LD-2C	WMU 1, Cell 2-B LDS	See Note 2	Weekly[3]
LD-3A	WMU 1, Cell 3-A LDS	See Note 2	Weekly[3]
LD-3B	WMU 1, Cell 3-B LDS	See Note 2	Weekly[3]

[1] Weekly from 15 October through 30 April

[2] Head in 0.1 feet, and quantity of liquid removed in gallons

[3] Year around monitoring

For all LCRS sumps, pan lysimeters, and leak detection sumps the Discharger shall conduct monitoring and reporting of its LCRS sumps, pan lysimeters, and leak detection sumps in accordance with the table above. Furthermore the Discharger shall immediately notify Central Valley Water Board staff by telephone and email and immediately take measures to minimize head on the LCRS sump primary liner in the event that hydraulic head on the LCRS sump primary liner exceeds one-foot.

e. **Groundwater Separation**

During the wet season (November 1 through April 30) the Discharger shall determine compliance with the siting requirements for groundwater separation by monitoring for and reporting groundwater separation along the base and side slopes of the WMU cells. If at any time the Discharger fails to maintain the required separation the Discharger shall notify Central Valley Water Board staff by telephone and email and immediately take measures to restore separation between groundwater and waste along the side slopes and base of the LCRS.

The Discharger shall report the results of its groundwater separation monitoring as part of its semiannual reporting requirement.

Cell	Base of Waste elevation[1] (0.1 Ft NAVD 88)	Monitoring Frequency	Calculated groundwater elevation[2] (0.1 Ft NAVD 88)	WDR groundwater and side slope separation requirement (0.1 Ft)	Calculated Separation[3] between waste and groundwater (0.1 Ft)	Compliance with groundwater separation requirements (Y/N)
Regional Groundwater Zone						
1A	97.3	Weekly				
1B	92.4	Weekly				
2A	98.6	Weekly				
2B	97.8	Weekly				
3A	102.2	Weekly				
3B	101.8	Weekly				
Future Cells		Weekly				
Shallow Groundwater Zone						
1A	97.3	Weekly				
1B	92.4	Weekly				
2A	98.6	Weekly				
2B	97.8	Weekly				
3A	102.2	Weekly				
3B	101.8	Weekly				
Future Cells		Weekly				

B. REPORTING

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

Section	Report	End of Reporting Period	Due Date
B.1	Semiannual Monitoring Report	30 June, 31 December	**1 August, 1 February**
B.2	Annual Monitoring Report	31 December	**1 February**
B.3	Seep Reporting	Continuous	**Immediately & 7 Days**
B.4	Annual Facility Inspection Report	31 October	**15 November**
B.5	Major Storm Event Reporting	Continuous	**7 days from damage discovery**
B.6	Survey and Iso-Settlement Map for Closed Landfills	Every Five Years	**At Closure Completion and Every Five Years**
B.7	Financial Assurances Report	31 December	**1 June**

The Discharger shall enter all monitoring data and reports i.e., technical reports, work plans, etc., including but not limited to all boring logs and groundwater elevations into the online Geotracker database as required by Division 3 of Title 27 and Chapter 30, Division 3 of Title 23. Notification of the Geotracker upload shall be emailed to the Central Valley Water Board at: centralvalleysacramento@waterboards.ca.gov.

To ensure that the submittal is routed to the appropriate staff as quickly as possible, the following information shall be included in the body of the email:

Attention:	Title 27 Compliance & Enforcement Unit
Report Title	
Geotracker Upload ID	
Discharger name:	Recology Ostrom Road
Facility name:	Recology Ostrom Road Landfill
County:	Yuba
CIWQS place ID:	246287

Reporting Requirements

Semiannually, the Discharger shall submit monitoring reports containing the data and information required in this MRP, and as required per the WDRs (Order No. R5-2018-0007) and the SPRRs—particularly SPRRs Section I ("Standard Monitoring Specifications") and Section J ("Response to a Release"). In reporting the monitoring data required by this MRP, 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 (i.e., on a flash drive or compact disk) with Optical Character Recognition (OCR).

Upon request by Central Valley Water Board staff, all groundwater elevation, field parameter readings, and analytical data shall be submitted in a digital tabulated format easily importable into data analysis software (e.g., Microsoft Excel®).

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.

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. **Semiannual Monitoring Report:** Monitoring reports shall be submitted semiannually and are due on **1 August** and **1 February**. Each semiannual monitoring report shall contain at least the following:

   a) For each groundwater monitoring point addressed by the report, the field datasheets shall provide 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. (See Title 27, § 20415, subd. (e)(15).) The Discharger shall provide a map showing the potentiometric surface showing groundwater elevation relative to the bottom of waste e.g., waste in the LCRS and LCRS sump and make a determination whether the Discharger has maintained

minimum separation between the waste and the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored including the capillary fringe as required in WDRs Order No. R5-2018-0007.

d) Cumulative tabulated monitoring data for all monitoring points and constituents for groundwater (MRP Section A.1), unsaturated zone (MRP Section A.2), Leachate and Landfill Gas Condensate, Leak Detection System, Seep, and Class II Surface Impoundment Monitoring, and Annual LCRS Testing (MRP Section A.3), and surface water (MRP Section A.4). Concentrations below the laboratory reporting limit shall not be reported as "ND" unless the reporting limit is also given in the table. Otherwise, they shall be reported "< [reporting limit]" (e.g., "< 0.10"). Units shall be as required in Tables I-IV, unless specific justification is given to report in other units. Refer to the SPRRs Section I ("Standard Monitoring Specifications") for specific 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 actions taken under Section J (Response to a Release) for verified exceedances of a concentration limit for wells/constituents not already in corrective action monitoring.

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 (including in the leachate sump), and information about the required notification and corrective action in Standard Facility Specification E.13 of the applicable SPRRs.

h) A summary of all Standard Observations for the reporting period required in MRP Section A.5.d.

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 applicable SPRRs.

j) A comprehensive discussion of any Corrective Action Program required under MRP Section A.7.

2. **Annual Monitoring Report:** The Discharger shall submit an Annual Monitoring Report to the Central Valley Water Board by **1 February** covering the reporting period of the previous monitoring year. If desired, the Annual Monitoring Report may be combined with the second semiannual report, but if so, shall clearly state that it is both a semi-annual 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 since the

monitoring point was installed and the monitoring parameter was detected at least once since the monitoring point was installed. The graph shall also show the approved concentration limit at the time each sample was taken. If a five-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, Piper graph or Schoeller plot.

c) All historical monitoring data, including data for previous years, shall be submitted in tabular form in a digital file format easily importable into data analysis software (e.g., Microsoft Excel®). The Central Valley Water Board regards the submittal of data in hard copy and in digital format as the form necessary for statistical analysis facilitating periodic review. (See Title 27, § 20420, subd. (h).)

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 applicable SPRRs.

i) Updated concentration limits for each monitoring parameter at each monitoring well based on the new data set where updated concentration limits have been reviewed and approved.

j) The Discharger shall provide a map showing the potentiometric surface showing groundwater elevation relative to the bottom of waste e.g., waste in the LCRS and LCRS sump and make a determination whether the Discharger has maintained minimum separation between the waste and the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored including the capillary fringe as required in WDRs Order No. R5-2018-0007.

3. **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 with photographs);

   d) Verification that samples have been submitted for analyses of the Field Parameters and Monitoring Parameters listed in Table III, 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.

4. **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. (See MRP § A.5.a, above.)

5. **Major Storm Event Reporting:** Following major storm events capable of causing damage or significant erosion, the Discharger shall notify Central Valley Water Board staff **immediately upon discovery** of any damage or significant erosion; and report subsequent repairs **within 14 days** of completion of the repairs. Photographs of any problem(s) and repairs performed shall be submitted with the report. (See MRP § A.5.b, above.) As part of the Annual Report the Discharger shall report recorded onsite rainfall.

6. **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, subdivision (e). (See MRP § A.5.c, above.)

7. **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. (See WDRs Order No. R5-2018-0007, Financial Assurances Specifications F.1–F.3.)

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For each Waste Management Unit (WMU), the Water Quality Protection Standard (WQPS) 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 WQPS 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 WQPS, including biennial (every two years) updates to concentration limits, shall be submitted in a report for review and approval prior to implementation of revised concentration limits.

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 COCs that are detected in 10 percent or greater of the background data (naturally-occurring constituents) using a statistical procedure from Title 27, section 20415, subdivisions (e)(8)(A)-(E).

e. Include a retesting procedure to confirm or deny measurably significant evidence of a release pursuant to section 20415, subdivision (e)(8)(E) and section 20420, subdivisions (j)(1)-(3) of Title 27.

The WQPS 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 WQPS.

The Discharger proposed the methods for calculating concentration limits in the annual 2016 *Water Quality Protection Standard Report*. The limits are calculated using Interwell tolerance limits (TLs) at 95 percent confidence and 95 percent coverage based on background data from each monitoring well.

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)

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 WMU, and are required to be monitored every five years. (See Title 27, § 20395, 20420, subd. (g).) The facility WMU "Five-year COCs" are listed in Tables I-V for the specified monitored medium. The Discharger shall monitor all COCs every five years, or more frequently as required in accordance with a Corrective Action Program. The last five-year COC report submitted to the Central Valley Water Board was the 2016 *Second Semiannual Monitoring Report*. Five-year COCs are due to be monitored again in **December 2021**.

Any confirmed COCs detected during its five-year monitoring schedule using Table VI shall be added to Table V for detection monitoring purposes.

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, subdivision (e)(8); or

b. By an alternate statistical method meeting the requirements of Title 27, section 20415, subdivision (e)(8)(E).

The methods for calculating concentration limits were included in a 2012 WQPS Amendment to the Discharger's 2009 WQPS Report. The approved method uses interwell tolerance limits at 95 percent confidence and 95 percent coverage and are updated annually.

The Discharger shall report current concentration limits for groundwater, unsaturated zone, and surface water with each monitoring report and provide comparison with monitoring results to evaluate whether the monitoring results exceed the current concentration limits.

The most recent concentration limits for select parameters as reported in the 1st semiannual *2017 Monitoring Report* were as follows:

Concentration Limits				
Monitoring Parameter	**Analysis Type**	**All Regional Groundwater Point of Compliance Wells**	**All Shallow Groundwater Point of Compliance Wells**	**All Unsaturated Zone Points of Compliance (Soil Pore Liquids)[6]**
pH (Std. Units)	Interwell	6.3-7.7	TBD[4]	5.76-7.99

Concentration Limits				All Unsaturated Zone Points of Compliance (Soil Pore Liquids)[6]
Monitoring Parameter	**Analysis Type**	**All Regional Groundwater Point of Compliance Wells**	**All Shallow Groundwater Point of Compliance Wells**	
EC[1] (umhos/cm)	Interwell	392	TBD[4]	1258
Bicarbonate (mg/L)	Interwell	150	TBD[4]	249
Chloride (mg/L)	Interwell	26	TBD[4]	5.0
Nitrate and Nitrite as N (mg/L)	Interwell	18	TBD[4]	36.7
Sulfate (mg/L)	Interwell	21	TBD[4]	199
TDS[2] (mg/L)	Interwell	330	TBD[4]	704
Iron (mg/L)	Interwell	0.10	TBD[4]	TBD
Manganese (mg/L)	Interwell	0.047	TBD[4]	TBD
Vanadium (mg/L)	Interwell	0.0078	TBD[4]	TBD
Total Organic Carbon (mg/L)	Interwell	3.0[6]	TBD[4]	TBD
VOCS[5] (ug/L)	Interwell	Non Detect	TBD[4]	Non Detect

Unsaturated Zone Concentration Limits (Soil Pore Gas)		
Monitoring Point	**Methane**	**VOCs[5]**
All Point of Compliance monitoring points	<1%	Non Detect

[1] Electrical Conductivity
[2] Total Dissolved Solids
[3] Milligrams per liter
[4] To be determined- The Discharger has not collected enough background monitoring data to establish concentration limits for shallow groundwater zone. The Discharger shall submit a WQPS report for the Shallow Zone as required by Provisions H.10 in WDRs Order R5-2018-0007.
[5] VOCs include all anthropogenic constituents such as but not limited to SVOCs, herbicides, pesticides (Organophosphorus compounds).
[6]Concentration limits for 2009 WQPS Report. The Discharger must use the most current concentration limits established in its most current WQPS report.

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 applicable SPRRs, then:

a. For analytes that are detected in less than 10 percent 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 applicable SPRRs.

b. For analytes that are detected in 10 percent 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 applicable 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 monitoring locations at the point of compliance:

a. **Groundwater**

Point of Compliance Well	Water Bearing Zone	Cell or Module
MW-2	Regional	WMU 1, Cell 3A
MW-2S	Regional	WMU 1, Cell 3A
MW-3	Regional	WMU 1, Cell 3B
MW-4	Regional	WMU 1
MW-4S	Regional	WMU 1
MW-5	Regional	WMU 1, Cells 1A,2A
MW-5S	Regional	WMU 1, Cells 1A,2A
MW-6	Regional	WMU 1
MW-6S	Regional	WMU 1
MW-7	Regional	WMU 1, Cells 2A
MW-7S	Regional	WMU 1, Cells 2A
MW-8	Regional	WMU 1
MW-8S	Regional	WMU 1
MW-16	Regional	WMU 1, Cells 1B,2B
MW-16S	Regional	WMU 1, Cells 1B,2B
MW-17	Regional	WMU 1
MW-18	Regional	WMU 1
MW-19	Regional	WMU 1
MW-20	Regional	WMU 1
T-1	Regional	WMU 1
T-1S	Regional	WMU 1
T-2	Regional	WMU 1
T-2S	Regional	WMU 1
T-3	Regional	WMU 1
T-4	Regional	WMU 1
PZ-9	Shallow	WMU 1B
PZ-11	Shallow	WMU 1, Cell 2A, 3A
PZ-12	Shallow	WMU 1, Cell 2A, 3A

Point of Compliance Well	Water Bearing Zone	Cell or Module
PZ-13	Shallow	WMU 1, Cell 2A, 3A
VZW-T1	Shallow	WMU 1
VZW-T2	Shallow	WMU 1
VZW-T3	Shallow	WMU 1
VZW-4	Shallow	WMU 1
VZW-T4	Shallow	WMU 1
VZW-5	Shallow	WMU 1
VZW-6	Shallow	WMU 1
VZW-8	Shallow	WMU 1
VZW-16	Shallow	WMU 1
VZW-17	Shallow	WMU 1
VZW-18	Shallow	WMU 1
VZW-19	Shallow	WMU 1
VZW-20	Shallow	WMU 1

b. **Unsaturated Zone**

Point of Compliance	Cell or Module
VZ-2	WMU 1, Cell 1A
PL-1A	WMU 1, Cell 1A (Pan Lysimeter)
PL-1B	WMU 1, Cell 1B (Pan Lysimeter)
PL-2A	WMU 1, Cell 2A (Pan Lysimeter)
PL-2B	WMU 1, Cell 2B (Pan Lysimeter)
PL-3A	WMU 1, Cell 3A (Pan Lysimeter)
PL-3B	WMU 1, Cell 3B (Pan Lysimeter)
LD-1B	WMU 1, Cell 1-B Leak Detection
LD-2B	WMU 1, Cell 2-B Leak Detection
LD-2C	WMU 1, Cell 2-B Leak Detection
LD-3A	WMU 1, Cell 3-A Leak Detection
LD-3B	WMU 1, Cell 3-B Leak Detection
MW-3[1]	WMU 1, Cell 3B
PZ-9[1]	WMU 1, Cell 1B
PZ-11[1]	WMU 1, Cell 2A, 3A
PZ-12[1]	WMU 1, Cell 2A, 3A
PZ-13[1]	WMU 1, Cell 1A, 2A
VZW-T1[1]	WMU 1
VZW-T2[1]	WMU 1
VZW-T3[1]	WMU 1
VZW-4[1]	WMU 1
VZW-T4[1]	WMU 1
VZW-5[1]	WMU 1
VZW-6[1]	WMU 1
VZW-8[1]	WMU 1
VZW-16[1]	WMU 1
VZW-17[1]	WMU 1
VZW-18[1]	WMU 1
VZW-19[1]	WMU 1

Point of Compliance	Cell or Module
VZW-20[1]	WMU 1
GP-1S/D	WMU 1, Cell 1A
GP-2S/D	WMU 1, Cell 1A
GP-3S/D	WMU 1, Cell 2A
GP-4S/D	WMU 1, Cell 1B
GP-5S/D	WMU 1, Cell 2B
GP-6S/D	WMU 1, Cell 3A
GP-7S/D	WMU 1, Cell 3A
GP-8S/D	WMU 1, Cell 3B
GP-9S/D	WMU 1, Cell 3B
GP-10S/D	WMU 1, Cell 3B
GP-11S/D	WMU 1
GP-12S/D	WMU 1

[1] Groundwater monitoring well to be sampled for soil-pore gas when reported as dry i.e., unable to obtain groundwater sample.

c. **Surface Waters**

Point of Compliance	Cell or Module
SW-3	Downgradient monitoring point in Best Slough
SB-1	Influent into Sedimentation Basin #1 (future)
SB-4	Influent into Sedimentation Basin #2 (future)

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. (See Title 27, § 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 MRP Section A.

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.

Ordered By: *Original signed by Assistant Executive Officer for*
PAMELA C. CREEDON, Executive Officer

2 February 2018
(Date)

VKJ

TABLE I

GROUNDWATER DETECTION MONITORING PROGRAM

Parameter	Geotracker Code	Units	Sampling Frequency	Reporting Frequency
Field Parameters				
Groundwater Elevation	GWELEV	Ft. & 100ths, M.S.L.	Quarterly[3]	Semiannual
Temperature	TEMP	^{o}F	Semiannual	Semiannual
Electrical Conductivity	SC	umhos/cm	Semiannual	Semiannual
pH	PH	pH units	Semiannual	Semiannual
Turbidity	TURB	Turbidity units	Semiannual	Semiannual
Monitoring Parameters				
Total Dissolved Solids (TDS)	TDS	mg/L[1]	Semiannual	Semiannual
Chloride	CL	mg/L	Semiannual	Semiannual
Carbonate	CACO3	mg/L	Semiannual	Semiannual
Bicarbonate	BICACO3	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	NO3N	mg/L	Semiannual	Semiannual
Sulfate	SO4	mg/L	Semiannual	Semiannual
Calcium	CA	mg/L	Semiannual	Semiannual
Magnesium	MG	mg/L	Semiannual	Semiannual
Potassium	K	mg/L	Semiannual	Semiannual
Sodium	NA	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	TOC	mg/L	5 years	December 2021
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 8270C or D)		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
[3] Groundwater monitoring wells and wells used only for monitoring groundwater elevation that have monitoring devices installed in them that are capable of daily monitoring groundwater elevation shall daily monitor and record groundwater elevation and report the results on a semiannual basis.

TABLE II

UNSATURATED ZONE DETECTION MONITORING PROGRAM

SOIL-PORE GAS[1]

Parameter	Geotracker Code	Units	Sampling Frequency	Reporting Frequency
Monitoring Parameters				
Volatile Organic Compounds[2] (USEPA Method TO-15)		ug/cm^3	Annual	Annual
Methane	CH4	%	Semiannual	Annual
Carbon Dioxide	CO2	%	Semiannual	Annual
Oxygen	OXYGEN	%	Semiannual	Annual

LYSIMETERS[3] (or other vadose zone monitoring point where liquid and gas may be present)

Parameter		Units	Sampling Frequency	Reporting Frequency
Field Parameters				
Electrical Conductivity	SC	umhos/cm	Semiannual	Semiannual
pH	PH	pH units	Semiannual	Semiannual
Volume of liquid removed		gallons	Monthly	Semiannual
Pan Lysimeter Liquid Head	-	0.1 Feet	Weekly[4]	Semiannual
Monitoring Parameters				
Total Dissolved Solids (TDS)	TDS	mg/L	Semiannual	Semiannual
Chloride	CL	mg/L	Semiannual	Semiannual
Carbonate	CACO3	mg/L	Semiannual	Semiannual
Bicarbonate	BICACO3	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	NO3N	mg/L	Semiannual	Semiannual
Sulfate	SO4	mg/L	Semiannual	Semiannual
Calcium	CA	mg/L	Semiannual	Semiannual
Magnesium	MG	mg/L	Semiannual	Semiannual
Potassium	K	mg/L	Semiannual	Semiannual
Sodium	NA	mg/L	Semiannual	Semiannual
Pentachlorophenol	PCP	ug/L	Semiannual	Semiannual
Arsenic (dissolved)	AS	ug/L	Semiannual	Semiannual
Copper (dissolved)	CU	ug/L	Semiannual	Semiannual
Chromium (dissolved)	CR	ug/L	Semiannual	Semiannual
Volatile Organic Compounds1 (in liquid matrix) (See Table V)	(See Table V)	ug/L	Semiannual	Semiannual
Volatile Organic Compounds in gas matrix (Use USEPA Method TO-15)	(See Table V)	ug/cm^3	Semiannual	Semiannual
Methane	CH4	%	Semiannual	Semiannual
Carbon Dioxide	CO2	%	Semiannual	Semiannual
Oxygen	OXYGEN	%	Semiannual	Semiannual
5-Year Constituents of Concern (see Table VI)				
Total Organic Carbon	TOC	mg/L	5 years	December 2021
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 8270C or D)		ug/L	5 years	'' ''

Chlorophenoxy Herbicides (USEPA Method 8151A)	ug/L	5 years	''	''
Organophosphorus Compounds (USEPA Method 8141B)	ug/L	5 years	''	''

1. Soil-pore gas samples collected from landfill gas probes are only subject to the VOC (USEPA Method TO-15) and methane sampling (not the other parameters listed for pan lysimeters).
2. Gas samples may be prescreened to determine if laboratory analysis using Method TO-15 is required. A gas analyzer for methane concentrations or a Photo Ionization Detector (PID) for total VOCs concentrations may be used. If methane concentrations exceeding 1.0 percent by volume OR organic vapors (total VOCs) are detected at a concentration greater than 1.0 ppm then a gas sample shall be obtained and analyzed for VOCs using EPA Method TO-15. Both the screening results and laboratory analysis results shall be reported. Otherwise, the Discharger shall report the methane or total VOC screening results and no further laboratory analysis is required.
3. Pan lysimeters shall be inspected for the presence of liquid **monthly**. If liquid is detected in a previously dry pan lysimeter, the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the liquid for Field and Monitoring Parameters listed in Table II.
4. Pan lysimeters that have monitoring devices installed in them that are capable of daily monitoring liquid elevation in the pan lysimeters shall daily monitor and record liquid elevation and report the results on a semiannual basis.

TABLE III

LEACHATE[1], LEAK DETECTION SYSTEM[1], GAS CONDENSATE[5], LEACHATE SEEP[2], AND CLASS II SURFACE IMPOUNDMENT MONITORING, AND ANNUAL LCRS TESTING [3]

Parameter	Geotracker Code	Units	Sampling Frequency	Reporting Frequency
Field Parameters				
Total Flow	-	Gallons	Monthly[6]	Semiannual
Flow Rate	FLOW	Gallons/Day	Monthly	Semiannual
Electrical Conductivity	SC	umhos/cm	Quarterly	Semiannual
pH	PH	pH units	Quarterly	Semiannual
LCRS and Leak Detection System Sump Head	-	0.1 Feet	Weekly[4]	Semiannual
Monitoring Parameters				
Total Dissolved Solids (TDS)	TDS	mg/L	Annually	Annually
Chloride	CL	mg/L	Annually	Annually
Carbonate as CACO3	CACO3	mg/L	Annually	Annually
Bicarbonate as CACO3	BICACO3	mg/L	Annually	Annually
Nitrate - Nitrogen	NO3N	mg/L	Annually	Annually
Sulfate	SO4	mg/L	Annually	Annually
Calcium	CA	mg/L	Annually	Annually
Magnesium	MG	mg/L	Annually	Annually
Manganese	MN	mg/L	Annually	Annually
Potassium	K	mg/L	Annually	Annually
Sodium	NA	mg/L	Annually	Annually
Pentachlorophenol	PCP	ug/L	Annual	Annually
Arsenic (dissolved)	AS	ug/L	Annual	Annually
Copper (dissolved)	CU	ug/L	Annual	Annually
Chromium (dissolved)	CR	ug/L	Annual	Annually
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)		ug/L	Annually	Annually
5-Year Constituents of Concern (see Table VI)				
Total Organic Carbon	TOC	mg/L	5 years	December 2021
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 8270C or D)		ug/L	5 years	'' ''
Chlorophenoxy Herbicides (USEPA Method 8151A)		ug/L	5 years	'' ''
Organophosphorus Compounds (USEPA Method 8141B)		ug/L	5 years	'' ''
LCRS Testing [3]		---	Annually	Annually

1. If liquid is detected in a previously dry sump (leachate, leak detection, etc.), the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the liquid for Field and Monitoring Parameters listed in Table III. Liquid in the sump shall then be

sampled for all parameters and constituents in accordance with the frequencies listed in Table III or whenever liquid is present.

2. 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.

3. The Discharger shall test each LCRS annually pursuant to Title 27, section 20340(d) to demonstrate proper operation of the LCRS drainage layer. The results of the tests shall be compared with previous annual LCRS tests made under comparable conditions.

4. LCRS and leak detection sumps that have monitoring devices installed in them that are capable of daily monitoring leachate and liquid elevation in the LCRS sump and leak detection system sump respectively shall daily monitor and record leachate and liquid elevation in the LCRS sump and leak detection system and report the results on a semiannual basis.

5. The Discharger shall sample gas condensate for the Field and Monitoring Parameters in this table. The quantity of gas condensate shall be estimated and reported in gallons/month.

6. The total flow shall be summed to provide a total volume collected from each LCRS, leak detection and gas condensate sump per month. The Discharger shall report the monthly totals on a semiannual basis for each LCRS sump i.e., monthly volumes of liquids removed from each landfill leachate LCRS, each leak detection system sump, and a summation of all gas condensate collection points.

TABLE IV

SURFACE WATER DETECTION MONITORING PROGRAM

Parameter	Geotracker Code	Units	Sampling Frequency[1]	Reporting Frequency
Field Parameters				
Electrical Conductivity	SC	umhos/cm	Semiannual	Semiannual
pH	PH	pH units	Semiannual	Semiannual
Turbidity	TURB	Turbidity units	Semiannual	Semiannual
Flow to Waters of U.S.		Yes or No	Semiannual	Semiannual
Monitoring Parameters				
Total Dissolved Solids (TDS)	TDS	mg/L	Semiannual	Semiannual
Carbonate	CACO3	mg/L	Semiannual	Semiannual
Bicarbonate	BICACO3	mg/L	Semiannual	Semiannual
Chloride	CL	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	NO3N	mg/L	Semiannual	Semiannual
Sulfate	SO4	mg/L	Semiannual	Semiannual
Calcium	CA	mg/L	Semiannual	Semiannual
Magnesium	MG	mg/L	Semiannual	Semiannual
Potassium	K	mg/L	Semiannual	Semiannual
Sodium	NA	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	TOC	mg/L	5 years	December 2021
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 8270C or D)		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 WATER QUALITY MONITORING

Surrogates for Metallic Constituents:

COC Description	Geotracker Code
pH	PH
Total Dissolved Solids	TDS
Electrical Conductivity	SC
Chloride	CL
Sulfate	SO4
Nitrate nitrogen	NO3N

Volatile Organic Compounds, short list (USEPA Method 8260B):

Acetone	ACE
Acrylonitrile	ACRAMD
Benzene	BZ
Bromochloromethane	BRCLME
Bromodichloromethane	BDCME
Bromoform (Tribromomethane)	TBME
Carbon disulfide	CDS
Carbon tetrachloride	CTCL
Chlorobenzene	CLBZ
Chloroethane (Ethyl chloride)	CLEA
Chloroform (Trichloromethane)	TCLME
Dibromochloromethane (Chlorodibromomethane)	DBCME
1,2-Dibromo-3-chloropropane (DBCP)	DBCP
1,2-Dibromoethane (Ethylene dibromide; EDB)	EDB
o-Dichlorobenzene (1,2-Dichlorobenzene)	DCBZ12
m-Dichlorobenzene (1,3-Dichlorobenzene)	DCBZ13
p-Dichlorobenzene (1,4-Dichlorobenzene)	DCBZ14
trans- l ,4-Dichloro-2-butene	DCBE14T
Dichlorodifluoromethane (CFC-12)	FC12
1,1-Dichloroethane (Ethylidene chloride)	DCA11
1,2-Dichloroethane (Ethylene dichloride)	DCA12
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)	DCE11
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)	DCE12C
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)	DCE12T
1,2-Dichloropropane (Propylene dichloride)	DCPA12
cis- 1,3-Dichloropropene	DCP13C
trans- 1,3-Dichloropropene	DCP13T
Di-isopropylether (DIPE)	DIPE
Ethanol	ETHANOL
Ethyltertiary butyl ether	ETBE
Ethylbenzene	EBZ
2-Hexanone (Methyl butyl ketone)	HXO2
Hexachlorobutadiene	HCBU
Methyl bromide (Bromomethene)	BRME
Methyl chloride (Chloromethane)	CLME

TABLE V

MONITORING PARAMETERS FOR WATER QUALITY MONITORING

Continued

Methylene bromide (Dibromomethane)	DBMA
Methylene chloride (Dichloromethane)	DCMA
Methyl ethyl ketone (MEK: 2-Butanone)	MEK
Methyl iodide (Iodomethane)	IME
Methyl t-butyl ether	MTBE
4-Methyl-2-pentanone (Methyl isobutylketone)	MIBK
Naphthalene	NAPH
Styrene	STY
Tertiary amyl methyl ether	TAME
Tertiary butyl alcohol	TBA
1,1,1,2-Tetrachloroethane	TC1112
1,1.2,2-Tetrachloroethane	PCA
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)	PCE
Toluene	BZME
1,2,4-Trichlorobenzene	TCB124
1,1,1-Trichloroethane (Methylchloroform)	TCA111
1,1,2-Trichloroethane	TCA112
Trichloroethylene (Trichloroethene)	TCE
Trichlorofluoromethane (CFC- 11)	FC11
1,2,3-Trichloropropane	TCPR123
Vinyl acetate	VA
Vinyl chloride	VC
Xylenes	XYLENES

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Inorganics (dissolved):	USEPA Method	Geotracker Code
Aluminum	6010	AL
Antimony	7041	SB
Barium	6010	BA
Beryllium	6010	BE
Cadmium	7131A	CD
Chromium	6010	CR
Cobalt	6010	CO
Copper	6010	CU
Silver	6010	AG
Tin	6010	SN
Vanadium	6010	V
Zinc	6010	ZN
Iron	6010	FE
Manganese	6010	MN
Arsenic	7062	AS
Lead	7421	PB
Mercury	7470A	HG
Nickel	7521	NI
Selenium	7742	SE
Thallium	7841	TL
Cyanide	9010C	CN
Sulfide	9030B	S

Volatile Organic Compounds, extended list (USEPA Method 8260B):

COC Description	Geotracker Code
Acetone	ACE
Acetonitrile (Methyl cyanide)	ACCN
Acrolein	ACRL
Acrylonitrile	ACRAMD
Allyl chloride (3-Chloropropene)	CLPE3
Benzene	BZ
Bromochloromethane (Chlorobromomethane)	BRCLME
Bromodichloromethane (Dibromochloromethane)	DBCME
Bromoform (Tribromomethane)	TBME
Carbon disulfide	CDS
Carbon tetrachloride	CTCL
Chlorobenzene	CLBZ
Chloroethane (Ethyl chloride)	CLEA
Chloroform (Trichloromethane)	TCLME
Chloroprene	CHLOROPRENE
Dibromochloromethane (Chlorodibromomethane)	DBCME
1,2-Dibromo-3-chloropropane (DBCP)	DBCP
1,2-Dibromoethane (Ethylene dibromide; EDB)	EDB
o-Dichlorobenzene (1,2-Dichlorobenzene)	DCBZ12

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

m-Dichlorobenzene (1,3-Dichlorobenzene)	DCBZ13
p-Dichlorobenzene (1,4-Dichlorobenzene)	DCBZ14
trans- 1,4-Dichloro-2-butene	DCBE14T
Dichlorodifluoromethane (CFC 12)	FC12
1,1 -Dichloroethane (Ethylidene chloride)	DCA11
1,2-Dichloroethane (Ethylene dichloride)	DCA12
1,1 -Dichloroethylene (1, l-Dichloroethene; Vinylidene chloride)	DCE11
cis- l ,2-Dichloroethylene (cis- 1,2-Dichloroethene)	DCE12C
trans- l ,2-Dichloroethylene (trans- 1,2-Dichloroethene)	DCE12T
1,2-Dichloropropane (Propylene dichloride)	DCPA12
1,3-Dichloropropane (Trimethylene dichloride)	DCPA13
2,2-Dichloropropane (Isopropylidene chloride)	DCPA22
1,1 -Dichloropropene	DCP11
cis- 1,3-Dichloropropene	DCP13C
trans- l ,3-Dichloropropene	DCP13T
Di-isopropylether (DIPE)	DIPE
Ethanol	ETHANOL
Ethyltertiary butyl ether	ETBE
Ethylbenzene	EBZ
Ethyl methacrylate	EMETHACRY
Hexachlorobutadiene	HCBU
2-Hexanone (Methyl butyl ketone)	HXO2
Isobutyl alcohol	ISOBTOH
Methacrylonitrile	METHACRN
Methyl bromide (Bromomethane)	BRME
Methyl chloride (Chloromethane)	CLME
Methyl ethyl ketone (MEK; 2-Butanone)	MEK
Methyl iodide (Iodomethane)	IME
Methyl t-butyl ether	MTBE
Methyl methacrylate	MMTHACRY
4-Methyl-2-pentanone (Methyl isobutyl ketone)	MIBK
Methylene bromide (Dibromomethane)	DBMA
Methylene chloride (Dichloromethane)	DCMA
Naphthalene	NAPH
Propionitrile (Ethyl cyanide)	PACN
Styrene	STY
Tertiary amyl methyl ether	TAME
Tertiary butyl alcohol	TBA
1,1,1,2-Tetrachloroethane	TC1112
1,1,2,2-Tetrachloroethane	PCA
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)	PCE
Toluene	BZME
1,2,4-Trichlorobenzene	TCB124
1,1,1 -Trichloroethane (Methylchloroform)	TCA111
1,1,2-Trichloroethane	TCA112
Trichloroethylene (Trichloroethene; TCE)	TCE

Trichlorofluoromethane (CFC- 11)	FC11

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

1,2,3-Trichloropropane	TCPR123
Vinyl acetate	VA
Vinyl chloride (Chloroethene)	VC
Xylene (total)	XYLENES

Semi-Volatile Organic Compounds (USEPA Method 8270C or D - base, neutral, & acid extractables):

Acenaphthene	ACNP
Acenaphthylene	ACNPY
Acetophenone	ACPHN
2-Acetylaminofluorene (2-AAF)	ACAMFL2
Aldrin	ALDRIN
4-Aminobiphenyl	AMINOBPH4
Anthracene	ANTH
Benzo[a]anthracene (Benzanthracene)	BZAA
Benzo[b]fluoranthene	BZBF
Benzo[k]fluoranthene	BZKF
Benzo[g,h,i]perylene	BZGHIP
Benzo[a]pyrene	BZAP
Benzyl alcohol	BZLAL
Bis(2-ethylhexyl) phthalate	BIS2EHP
alpha-BHC	BHCALPHA
beta-BHC	BHCBETA
delta-BHC	BHCDELTA
gamma-BHC (Lindane)	BHCGAMMA
Bis(2-chloroethoxy)methane	BECEM
Bis(2-chloroethyl) ether (Dichloroethyl ether)	BIS2CEE
Bis(2-chloro-1-methyethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)	BIS2CIE
4-Bromophenyl phenyl ether	BPPE4
Butyl benzyl phthalate (Benzyl butyl phthalate)	BBP
Chlordane	CHLORDANE
p-Chloroaniline	CLANIL4
Chlorobenzilate	CLBZLATE
p-Chloro-m-cresol (4-Chloro-3-methylphenol)	C4M3PH
2-Chloronaphthalene	CNPH2
2-Chlorophenol	CLPH2
4-Chlorophenyl phenyl ether	CPPE4
Chrysene	CHRYSENE
o-Cresol (2-methylphenol)	MEPH2
m-Cresol (3-methylphenol)	MEPH3
p-Cresol (4-methylphenol)	MEPH4
4,4'-DDD	DDD44
4,4'-DDE	DDE44
4,4'-DDT	DDT44
Diallate	DIALLATE
Dibenz[a,h]anthracene	DBAHA

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

Dibenzofuran	DBF
Di-n-butyl phthalate	DNBP
3,3'-Dichlorobenzidine	DBZD33
2,4-Dichlorophenol	DCP24
2,6-Dichlorophenol	DCP26
Dieldrin	DIELDRIN
Diethyl phthalate	DEPH
p-(Dimethylamino)azobenzene	PDMAABZ
7,12-Dimethylbenz[a]anthracene	DMBZA712
3,3'-Dimethylbenzidine	DMBZD33
2,4-Dimehtylphenol (m-Xylenol)	DMP24
Dimethyl phthalate	DMPH
m-Dinitrobenzene	DNB13
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)	DN46M
2,4-Dinitrophenol	DNP24
2,4-Dinitrotoluene	DNT24
2,6-Dinitrotoluene	DNT26
Di-n-octyl phthalate	DNOP
Diphenylamine	DPA
Endosulfan I	ENDOSULFANA
Endosulfan II	ENDOSULFANB
Endosulfan sulfate	ENDOSULFANS
Endrin	ENDRIN
Endrin aldehyde	ENDRINALD
Ethyl methanesulfonate	EMSULFN
Famphur	FAMPHUR
Fluoranthene	FLA
Fluorene	FL
Heptachlor	HEPTACHLOR
Heptachlor epoxide	HEPT-EPOX
Hexachlorobenzene	HCLBZ
Hexachlorocyclopentadiene	HCCP
Hexachloroethane	HCLEA
Hexachloropropene	HCPR
Indeno(1,2,3-c,d)pyrene	INP123
Isodrin	ISODRIN
Isophorone	ISOP
Isosafrole	ISOSAFR
Kepone	KEP
Methapyrilene	MTPYRLN
Methoxychlor	MTXYCL
3-Methylcholanthrene	MECHLAN3
Methyl methanesulfonate	MMSULFN
2-Methylnaphthalene	MTNPH2
1,4-Naphthoquinone	NAPHQ14
1-Naphthylamine	AMINONAPH1
2-Naphthylamine	AMINONAPH2
o-Nitroaniline (2-Nitroaniline)	NO2ANIL2
m-Nitroaniline (3-Nitroaniline)	NO2ANIL3

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

p-Nitroaniline (4-Nitroaniline)	NO2ANIL4
Nitrobenzene	NO2BZ
o-Nitrophenol (2-Nitrophenol)	NTPH2
p-Nitrophenol (4-Nitrophenol)	NTPH4
N-Nitrosodi-n-butylamine (Di-n-butylnitrosamine)	NNSBU
N-Nitrosodiethylamine (Diethylnitrosamine)	NNSE
N-Nitrosodimethylamine (Dimethylnitrosamine)	NNSM
N-Nitrosodiphenylamine (Diphenylnitrosamine)	NNSPH
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine)	NNSPR
N-Nitrosomethylethylamine (Methylethylnitrosamine)	NNSME
N-Nitrosopiperidine	NNSPPRD
N-Nitrosospyrrolidine	NNSPYRL
5-Nitro-o-toluidine	TLDNONT5
Pentachlorobenzene	PECLBZ
Pentachloronitrobenzene (PCNB)	PECLNO2BZ
Pentachlorophenol	PCP
Phenacetin	PHNACTN
Phenanthrene	PHAN
Phenol	PHENOL
p-Phenylenediamine	ANLNAM4
Polychlorinated biphenyls (PCBs; Aroclors)	PCBS
Pronamide	PRONAMD
Pyrene	PYR
Safrole	SAFROLE
1,2,4,5-Tetrachlorobenzene	C4BZ1245
2,3,4,6-Tetrachlorophenol	TCP2346
o-Toluidine	TLDNO
Toxaphene	TOXAP
2,4,5-Trichlorophenol	TCP245
0,0,0-Triethyl phosphorothioate	TEPTH
sym-Trinitrobenzene	TNB135

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

Chlorophenoxy Herbicides (USEPA Method 8151A):

2,4-D (2,4-Dichlorophenoxyacetic acid)	24D
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)	DINOSEB
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)	SILVEX
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	245T

Organophosphorus Compounds (USEPA Method 8141B):

Atrazine	ATRAZINE
Chlorpyrifos	CLPYRIFOS
0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)	ZINOPHOS
Diazinon	DIAZ
Dimethoate	DIMETHAT
Disulfoton	DISUL
Methyl parathion (Parathion methyl)	PARAM
Parathion	PARAE
Phorate	PHORATE
Simazine	SIMAZINE

TABLE VII

LANDFILL GAS CORRECTIVE ACTION MONITORING PROGRAM (IF REQUIRED IN SECTION A.7)

Parameter	Geotracker Code	Units	Sampling Frequency	Reporting Frequency
LFG Control System				
Control System Run-time	--	Hours	Quarterly	Semiannual
Control System Down-time	--	%	Quarterly	Semiannual
Temperature into Plant	--	^{0}F	Quarterly	Semiannual
Flare Combustion Temperature	--	^{0}F	Quarterly	Semiannual
System Vacuum	--	mm Hg vacuum	Quarterly	Semiannual
Totalized flow into Plant	--	Cubic Feet	Quarterly	Semiannual
Totalized flow rate into Plant	--	CFM	Quarterly	Semiannual
LFG Control System Influent				
Volatile Organic Compounds (USEPA TO-15)	--	ug/cm	Quarterly	Semiannual
Methane	--	%	Quarterly	Semiannual
LFG Extraction Wells (As specified in Section A.7)				
Atmospheric Temperature	--	^{0}F	Quarterly	Semiannual
Atmospheric Pressure	--	inches Hg	Quarterly	Semiannual
Methane	--	% by volume	Quarterly	Semiannual
Carbon Dioxide	--	% by volume	Quarterly	Semiannual
Oxygen	--	% by volume	Quarterly	Semiannual
Remainder gas	--	% by volume	Quarterly	Semiannual
Gas temperature at each well	--	^{0}F	Quarterly	Semiannual
Initial static pressure in wellhead	--	inches H20	Quarterly	Semiannual
Adjusted static pressure in Wellhead	--	inches H20	Quarterly	Semiannual
LFG Probes (As specified in Section A.7)				
Atmospheric Temperature	--	^{0}F	Quarterly	Semiannual
Atmospheric Pressure	--	inches Hg	Quarterly	Semiannual
Methane	--	% by volume	Quarterly	Semiannual
Carbon Dioxide	--	% by volume	Quarterly	Semiannual
Oxygen	--	% by volume	Quarterly	Semiannual
Remainder gas	--	% by volume	Quarterly	Semiannual
Probe pressure/vacuum	--	inches H20	Quarterly	Semiannual
Volatile Organic Compounds[1] (USEPA TO-15)	--	ug/cm	Quarterly	Semiannual

[1.] Gas samples may be prescreened to determine if laboratory analysis using Method TO-15 is required. A gas analyzer for methane concentrations or a Photo Ionization Detector (PID) for total VOCs concentrations may be used. If methane concentrations exceeding 1.0 percent by volume OR organic vapors (total VOCs) are detected at a concentration greater than 1.0 ppm then a gas sample shall be obtained and analyzed for VOCs using EPA Method TO-15. Both the screening results and laboratory analysis results shall be reported. Otherwise, the Discharger shall report the methane or total VOC screening results and no further laboratory analysis is required.

TABLE VIII

DEWATERED SEWAGE AND WATER TREATMENT SLUDGE MONITORING

DISCHARGE MONITORING TO BIOSOLIDS CLASS II SURFACE IMPOUNDMENT(S)

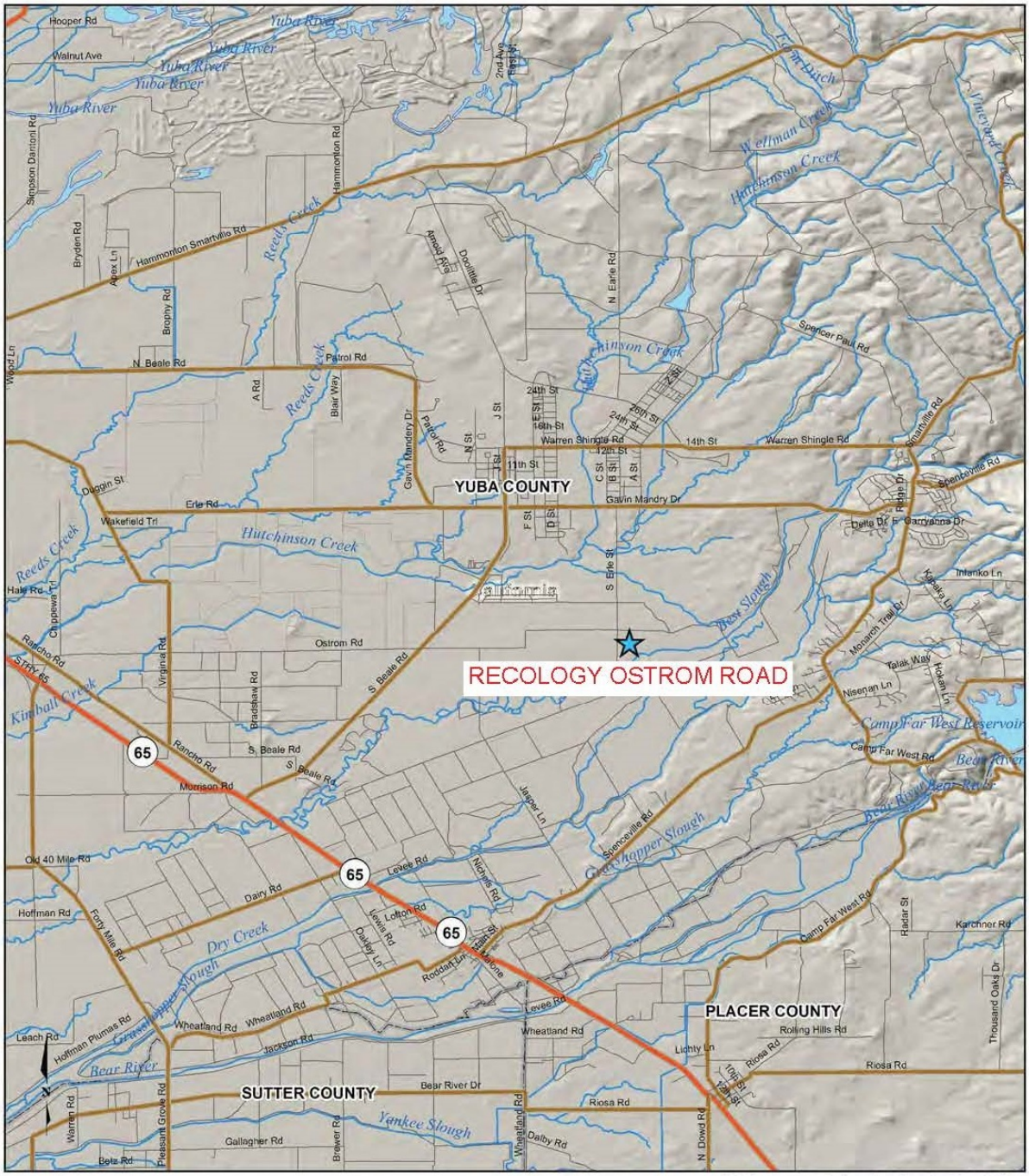
Parameter	Units	Frequency
Type of material discharged	-----	Monthly
Quantity discharged	cubic yards, wet tons	Monthly
Moisture Content	percent	Monthly
Capacity of unit/module remaining	percent	Monthly

DISCHARGE MONITORING TO BIOSOLIDS SLUDGE DRYING BEDS

Parameter	Units	Frequency
Initial sludge depth	inches and # of lifts	Monthly
Quantity discharged	cubic yards, wet tons	Monthly
Moisture Content	percent	Monthly
Location within Drying Bed	quadrant	Monthly
Quantity removed	cubic yards, wet tons	Monthly
Moisture content	percent	Monthly
Location within Drying Bed	quadrant	Monthly
Final sludge depth	inches and # of lifts	Monthly
Area covered	acres	Monthly
Total drying cycles during period	-----	Monthly
Cumulative Drying Bed area covered	acres	Monthly

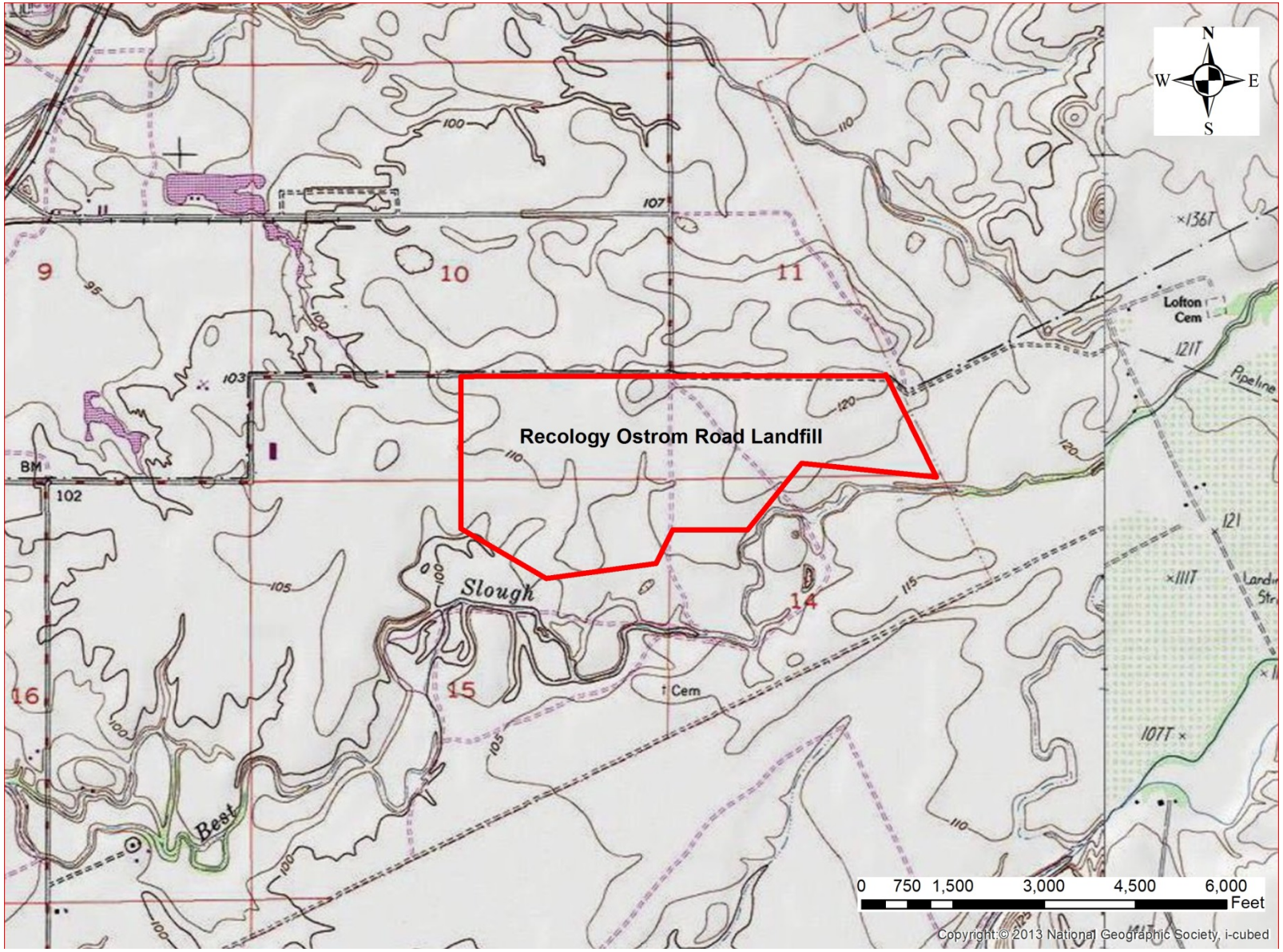
DEWATERED SEWAGE AND WATER TREATMENT SLUDGE DISPOSAL MONITORING

Parameter	Units	Frequency
Quantity discharged	cubic yards, wet tons	Per Disposal Operation
Moisture Content	percent	Per Disposal Operation
Disposal Location within WMU	quadrant	Per Disposal Operation
Solid to Liquid Ratio (by Weight)	fraction	Per Disposal Operation

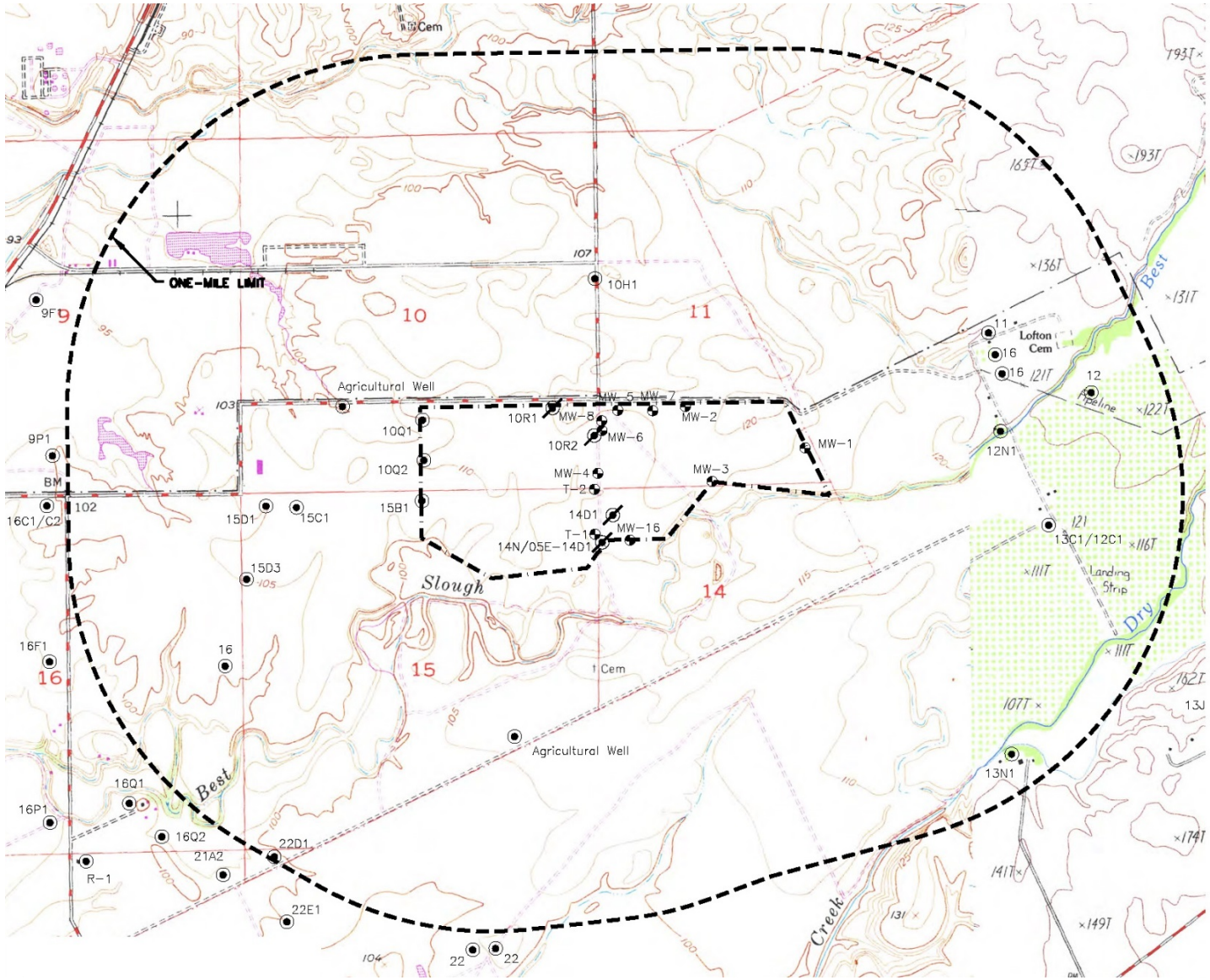


SITE LOCATION MAP
RECOLOGY OSTROM ROAD

Drawing Reference: Joint Technical Document (Rev. 10) Figure 2-1 – Site Location Map Golder Associates	**SITE LOCATION MAP** RECOLOGY OSTROM ROAD RECOLOGY OSTROM ROAD LANDFILL YUBA COUNTY



Drawing Reference: N/A	**PREDEVELOPMENT TOPOGRAPHY MAP** RECOLOGY OSTROM ROAD RECOLOGY OSTROM ROAD LANDFILL YUBA COUNTY	



LEGEND

- PROPERTY BOUNDARY
- ONE-MILE LIMIT
- 10R1 ABANDONED WELL
- 22D1 WATER SUPPLY WELL
- MW-1 GROUNDWATER MONITORING WELL

1,500 0 1,500
SCALE FEET

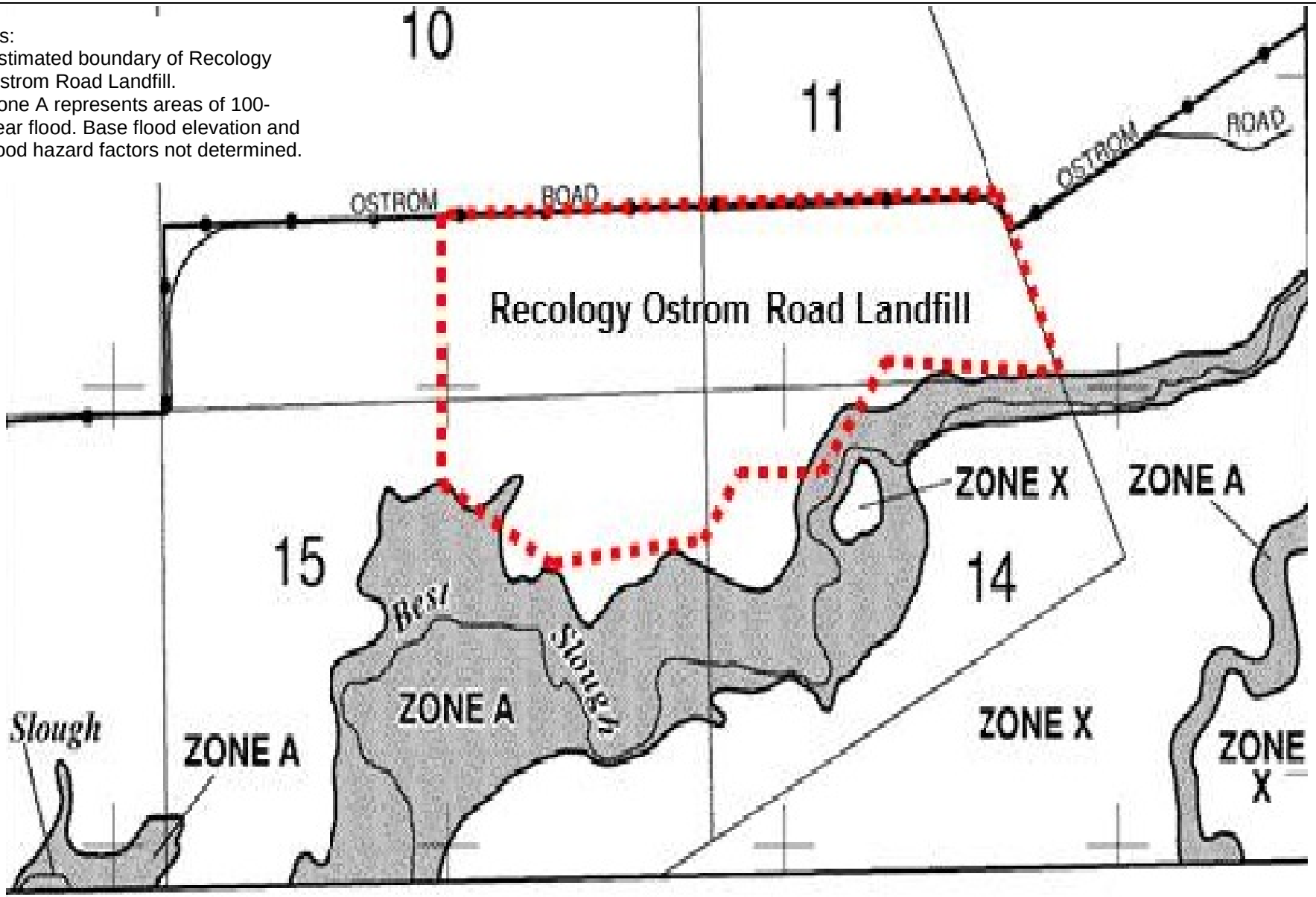
NOTES

1. WELL LOCATIONS OBTAINED FROM: GEOLOGY AND HYDROGEOLOGY INVESTIGATION, POTENTIAL LANDFILL AND LANDFILL BUFFER AREA OSTROM ROAD SANITARY LANDFILL, EINARSON, FOWLER & WATSON, APRIL 1998.
2. BASE MAP: USGS 7.5' QUADRANGLES OF CAMP FAR WEST (PROVISIONAL EDITION 1995) AND WHEATLAND, CALIFORNIA (1947, PHOTO-REVISED 1973).

Drawing Reference:
Joint Technical Document (Rev. 10)
Figure 4-8 Well Location Map
Golder Associates

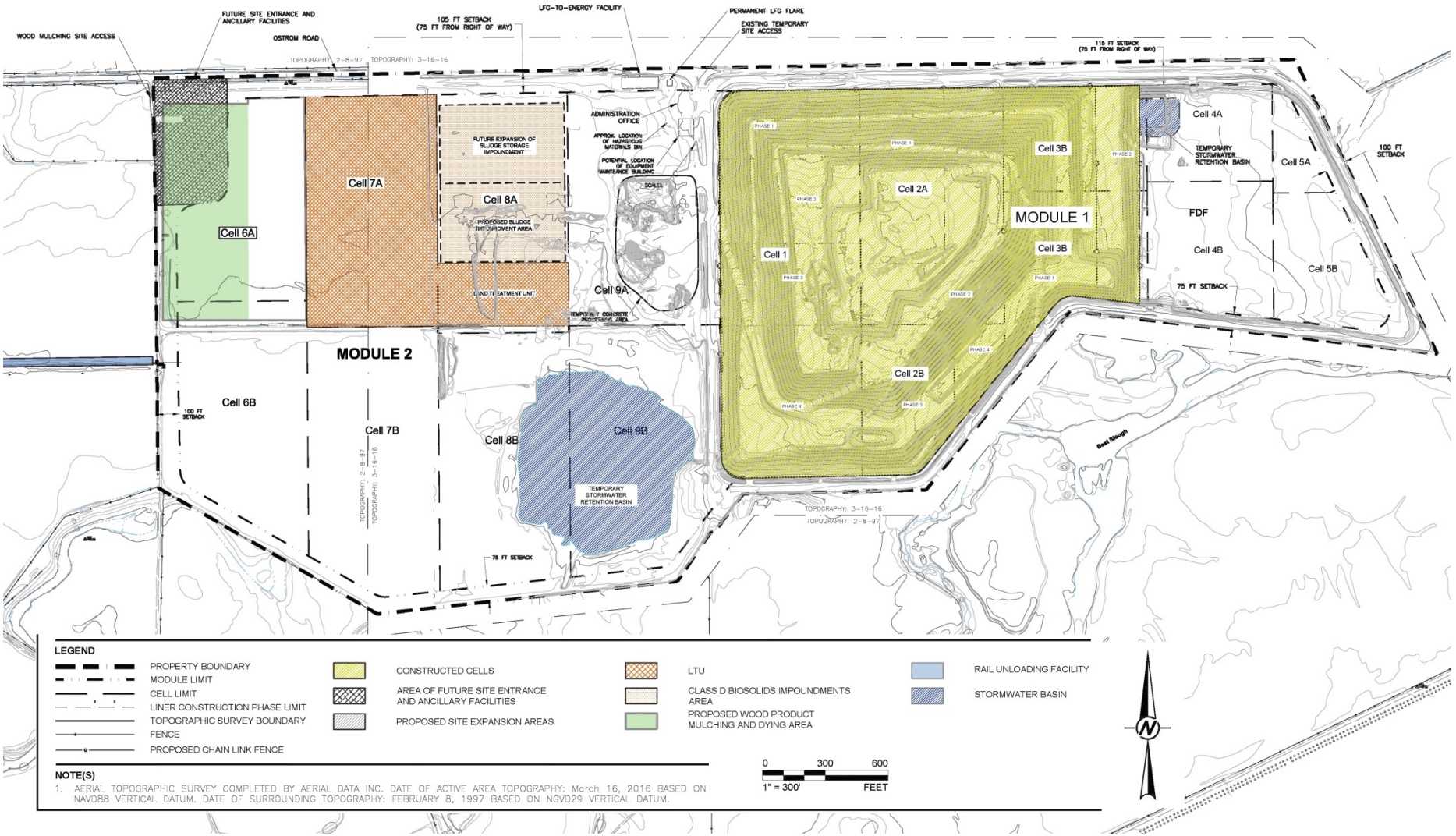
WATER SUPPLY WELLS WITHIN 1 MILE RADIUS
RECOLOGY OSTROM ROAD
RECOLOGY OSTROM ROAD LANDFILL
YUBA COUNTY

Notes:
1. Estimated boundary of Recology Ostrom Road Landfill.
2. Zone A represents areas of 100-year flood. Base flood elevation and flood hazard factors not determined.



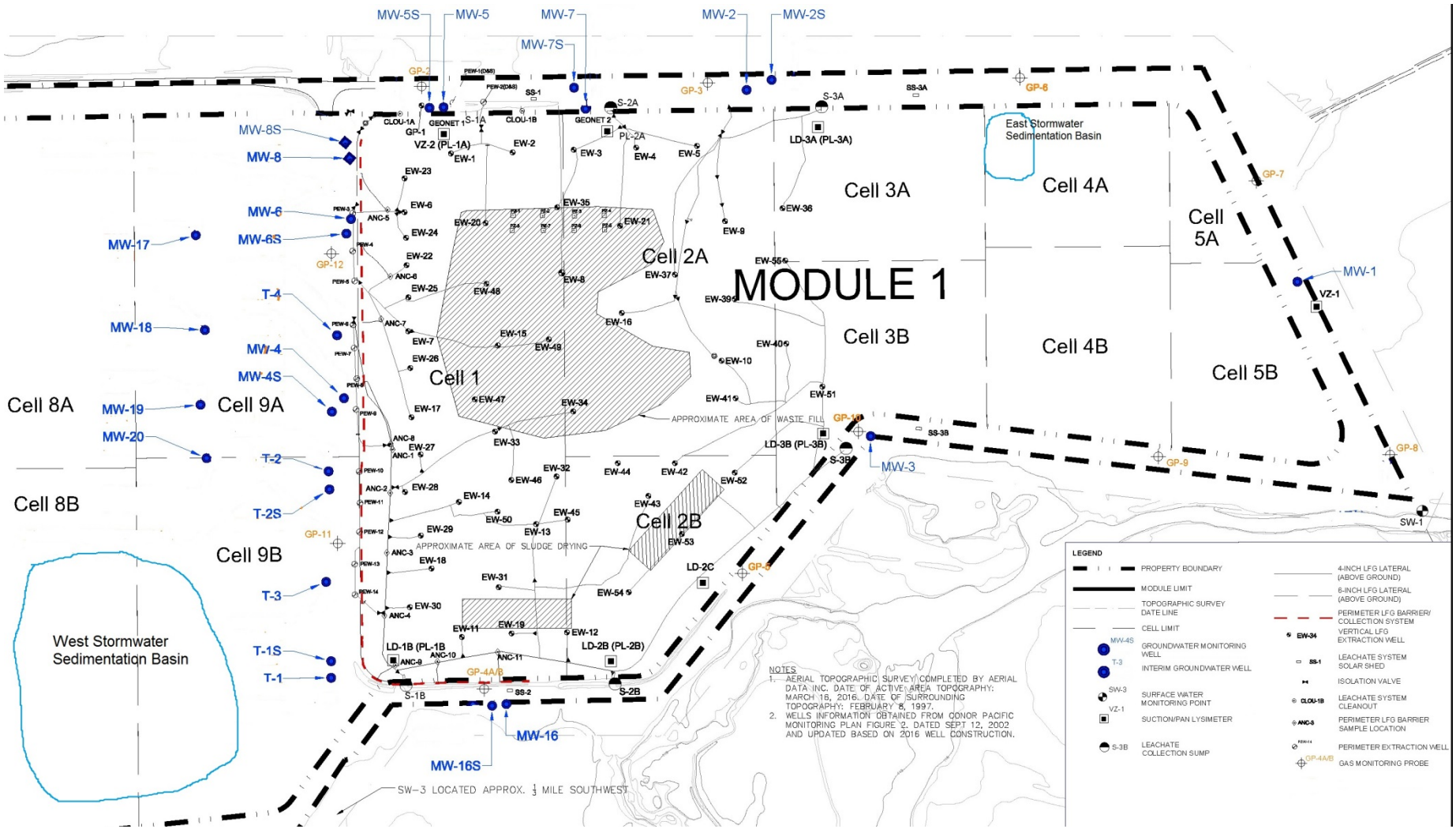
Drawing Reference:
FEMA MAP Number 06115C0450D
Effective Date: 18 February 2011

FLOODPLAIN MAP
RECOLOGY OSTROM ROAD
RECOLOGY OSTROM ROAD LANDFILL
YUBA COUNTY



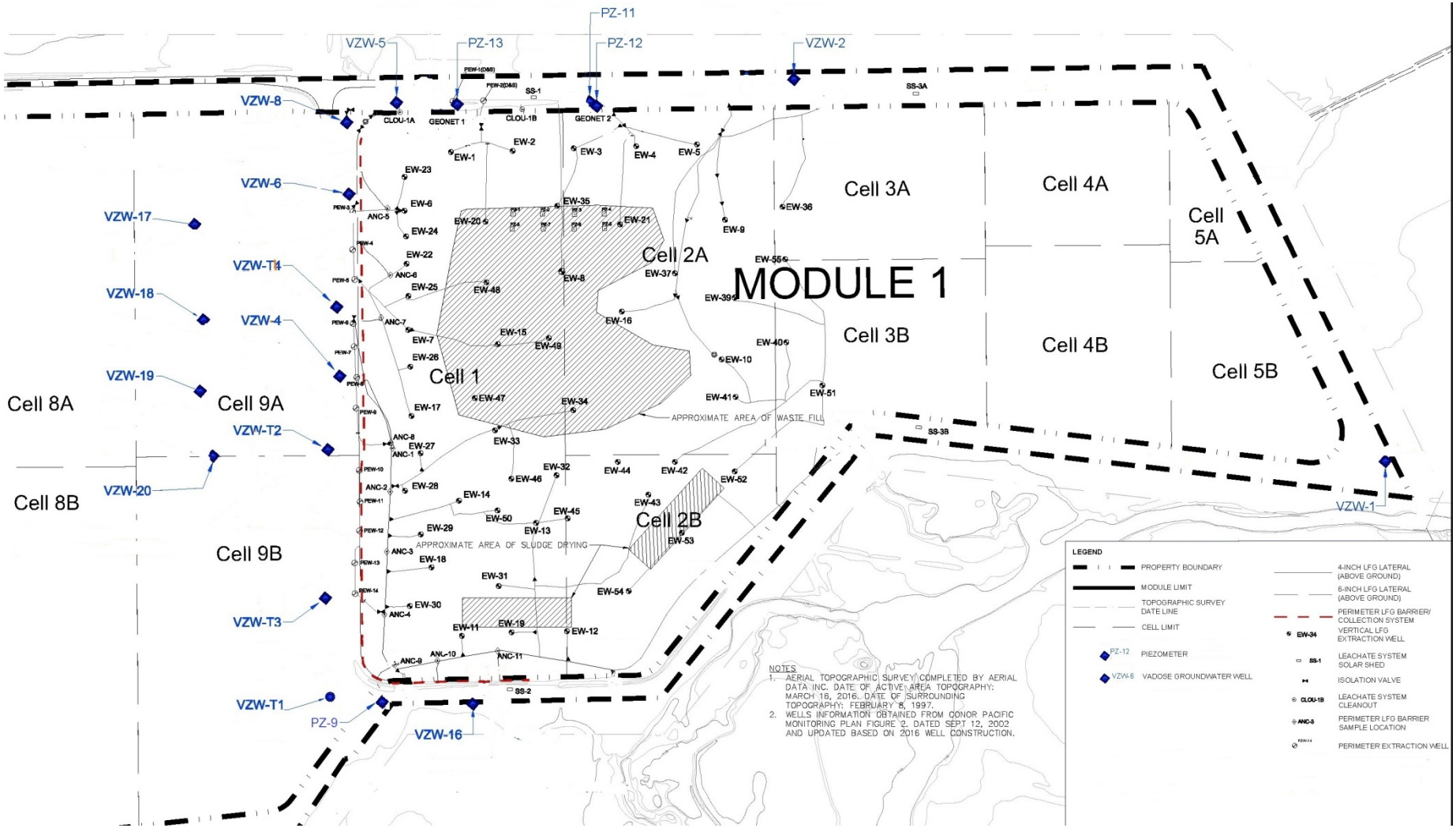
Drawing Reference:
Joint Technical Document (Rev. 10)
Figure 2-3 Site Plan
Golder Associates

EXISTING AND FUTURE PROPOSED SITE PLAN
RECOLOGY OSTROM ROAD
RECOLOGY OSTROM ROAD LANDFILL
YUBA COUNTY



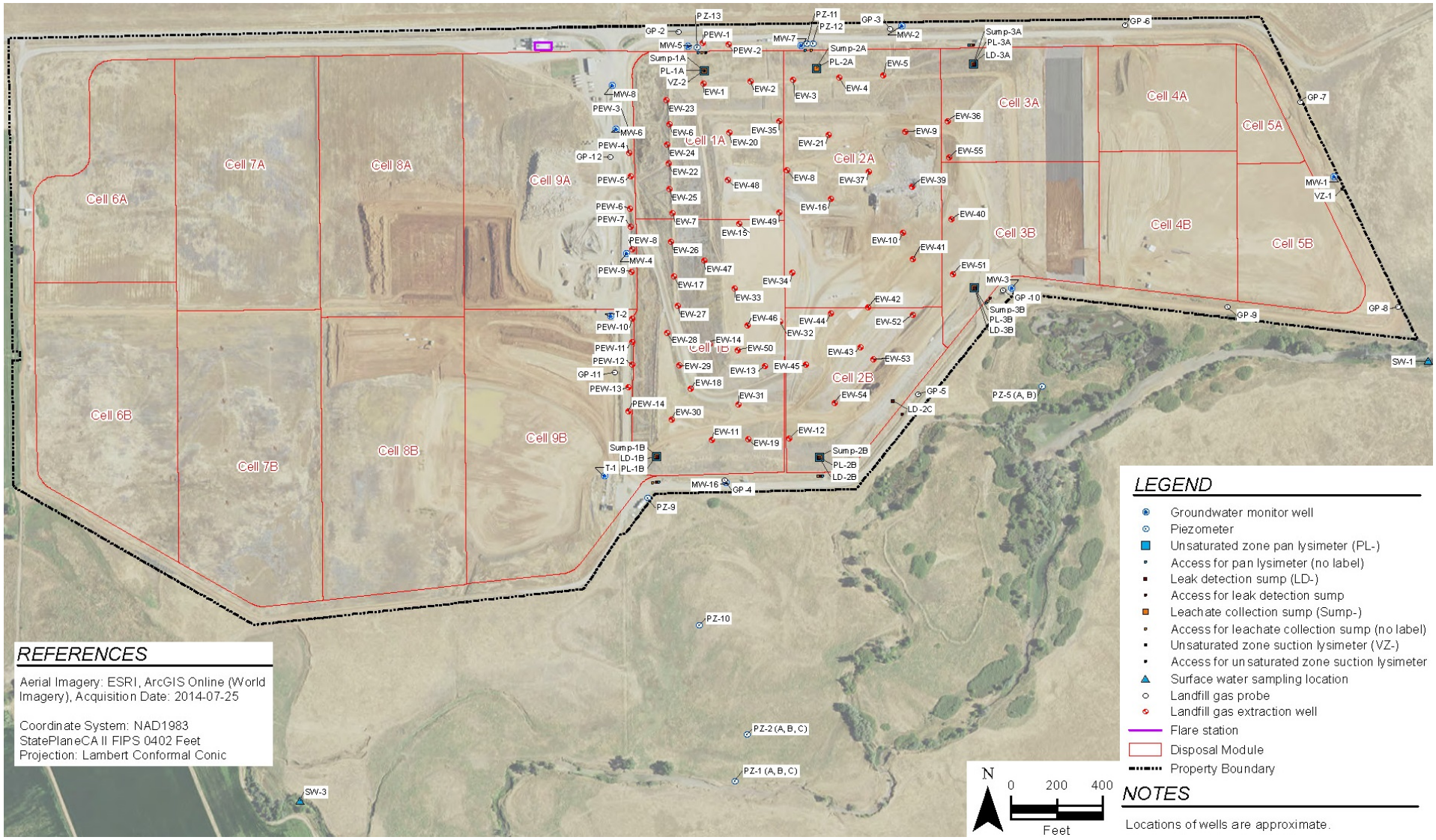
Drawing Reference:
Joint Technical Document (Rev. 10)
Figure 6-1A Existing Monitoring Plan
Golder Associates

EXISTING FACILITY MONITORING LOCATIONS (GROUNDWATER REGIONAL ZONE, UNSATURATED ZONE, AND SURFACE WATER)
RECOLOGY OSTROM ROAD, INC.
RECOLOGY OSTROM ROAD LANDFILL
YUBA COUNTY



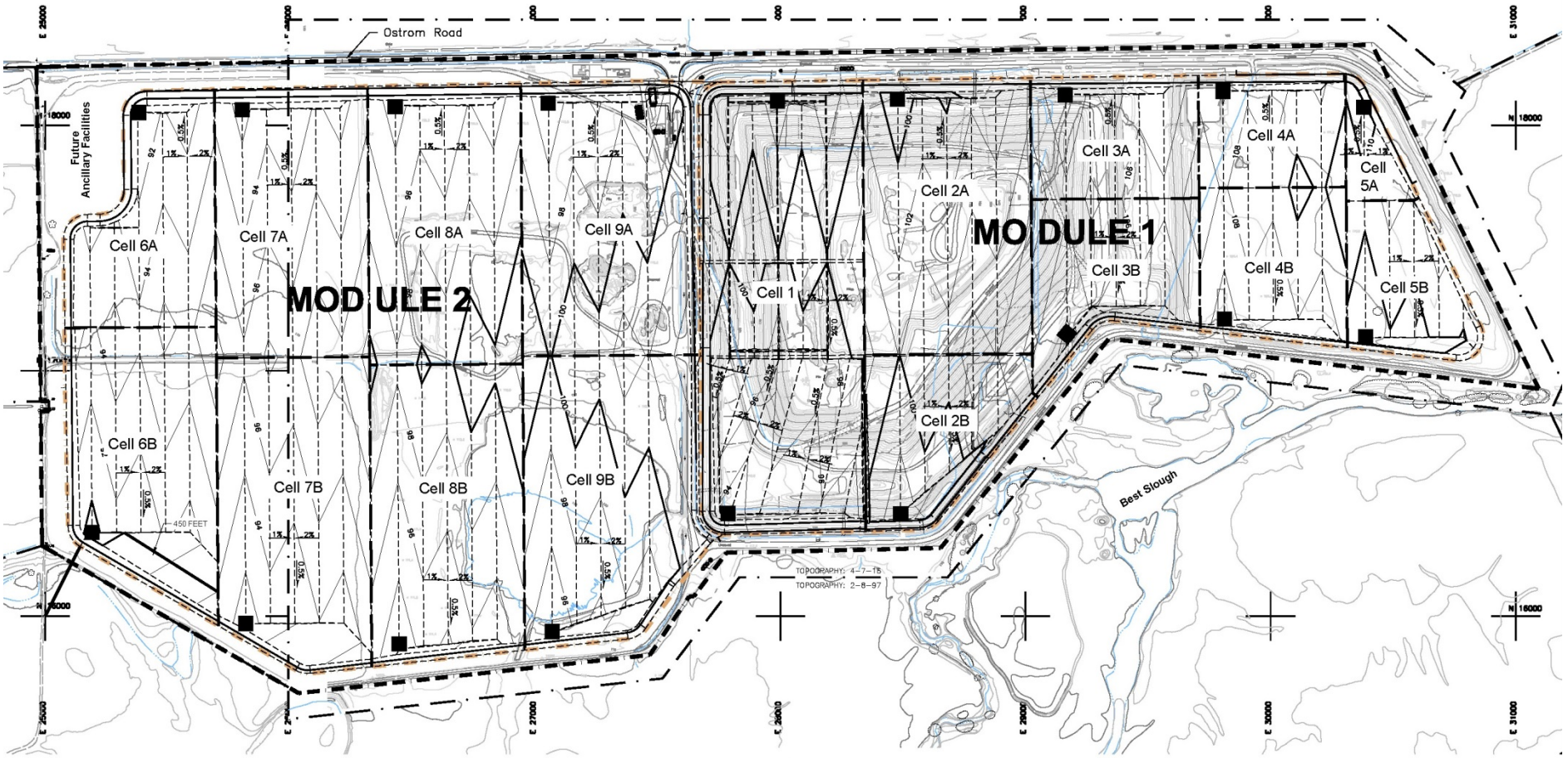
Drawing Reference:
Joint Technical Document (Rev. 10)
Figure 6-1A Existing Monitoring Plan
Golder Associates

EXISTING GROUNDWATER SHALLOW ZONE MONITORING SYSTEM LOCATIONS
RECOLOGY OSTROM ROAD, INC.
RECOLOGY OSTROM ROAD LANDFILL
YUBA COUNTY



Drawing Reference:
Joint Technical Document (Rev. 10)
Figure 1 Site Plan
Golder Associates

EXISTING LANDFILL GAS EXTRACTION AND MONITORING MAP
RECOLOGY OSTROM ROAD, INC.
RECOLOGY OSTROM ROAD LANDFILL
YUBA COUNTY



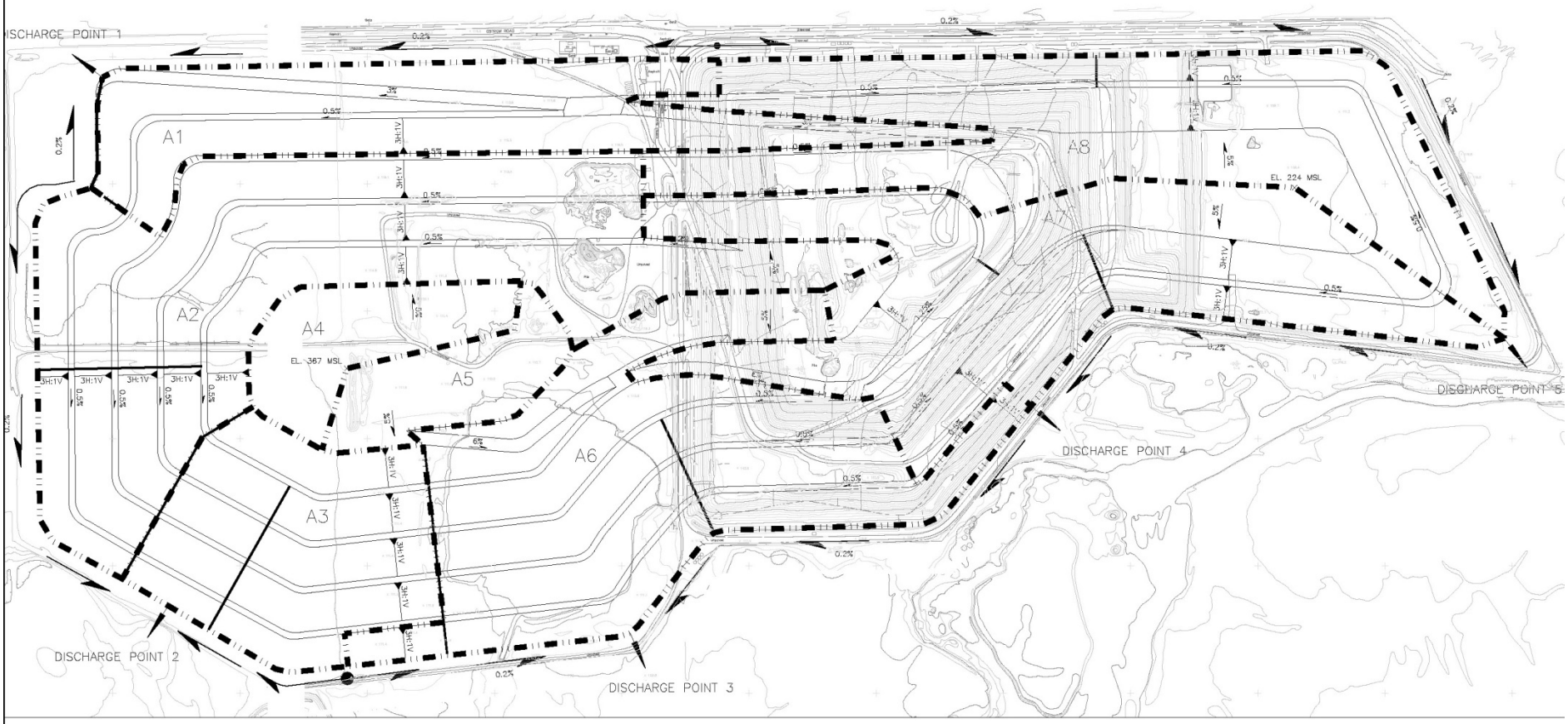
NOTES

1. AERIAL TOPOGRAPHIC SURVEY COMPLETED BY AERIAL DATA INC. DATE OF ACTIVE AREA TOPOGRAPHY: APRIL 7, 2016. DATE OF SURROUNDING TOPOGRAPHY: FEBRUARY 8, 1997.
2. GRADING PLAN REPRESENTS TOP OF GEOMEMBRANE LINER.

LEGEND

- PROPERTY BOUNDARY
- MODULE LIMIT
- CELL LIMIT
- GRADE INDICATOR
- SUMP LOCATION

Drawing Reference: Joint Technical Document (Rev. 10) Figure 2-4 Landfill Base Grading Plan Golder Associates	**PROPOSED LANDFILL BASE GRADING PLAN** RECOLOGY OSTROM ROAD, INC. RECOLOGY OSTROM ROAD LANDFILL YUBA COUNTY	



NOTE

1. AERIAL TOPOGRAPHIC SURVEY CONPLETED BY AERIAL DATA INC. DATE OF ACTIVE AREA TOPOGRAPHY: APRIL 7, 2016. DATE OF SURROUNDING TOPOGRAPHY: FEBRUARY 8, 1997.

LEGEND

- PERIMETER DRAINAGE DITCH FLOW LINE
- RUNOFF DISCHARGE POINTS
- DRAINAGE SUBAREAS
- DOWNDRAINS
- 3H:1V SLOPE INDICATOR
- 0.5% GRADE INDICATOR

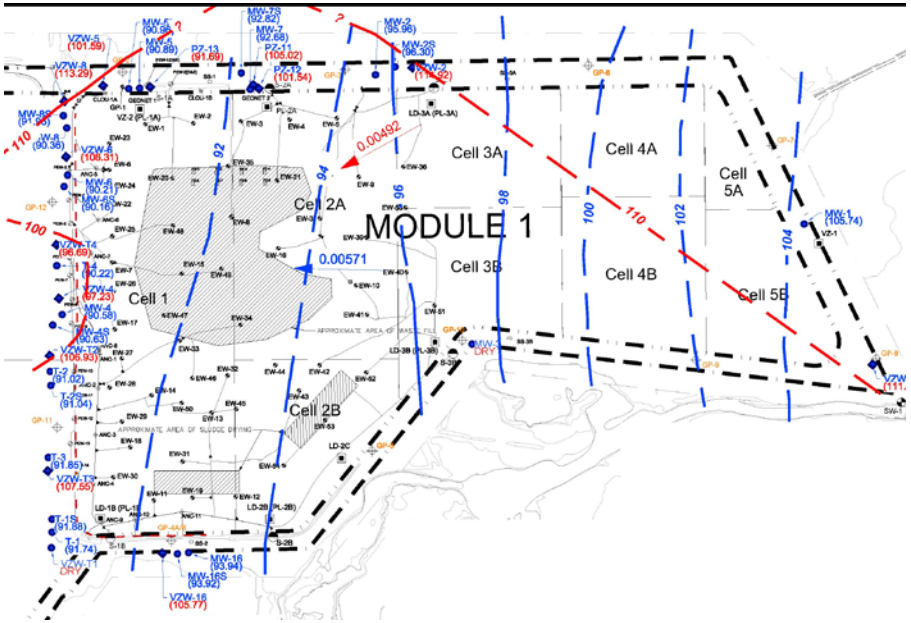
DRAINAGE AREAS

DRAINAGE SUBAREA	AREA (ACRES)	TRIBUTARY TO DISCHARGE POINT
A1	23.91	1
A2	48.21	2
A3	19.85	2
A4	8.33	2
A5	7.13	3
A6	40.09	3
A7	40.00	4
A8	36.44	5

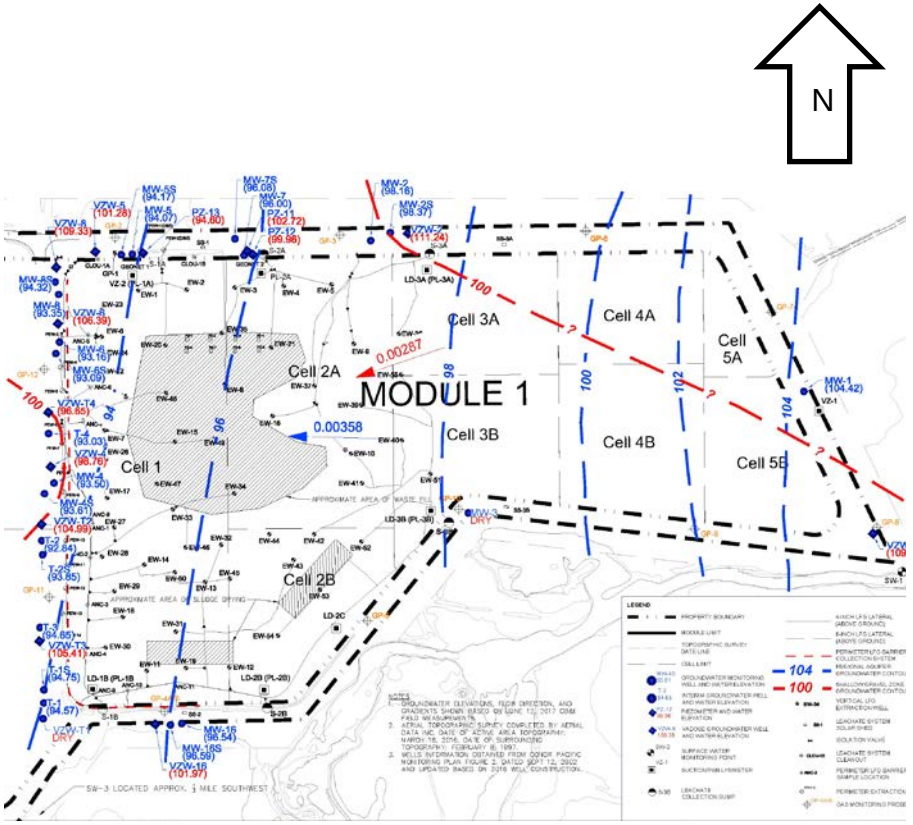
400 0 400
SCALE FEET

Drawing Reference:
Joint Technical Document (Rev. 10)
Figure 5-8 Cover Drainage Controls
Golder Associates

PROPOSED FINAL CLOSURE COVER DRAINAGE PLAN
RECOLOGY OSTROM ROAD, INC.
RECOLOGY OSTROM ROAD LANDFILL
YUBA COUNTY

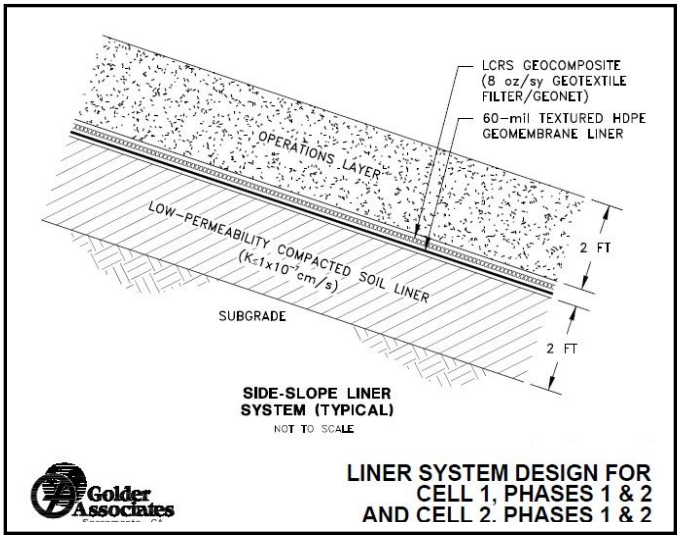


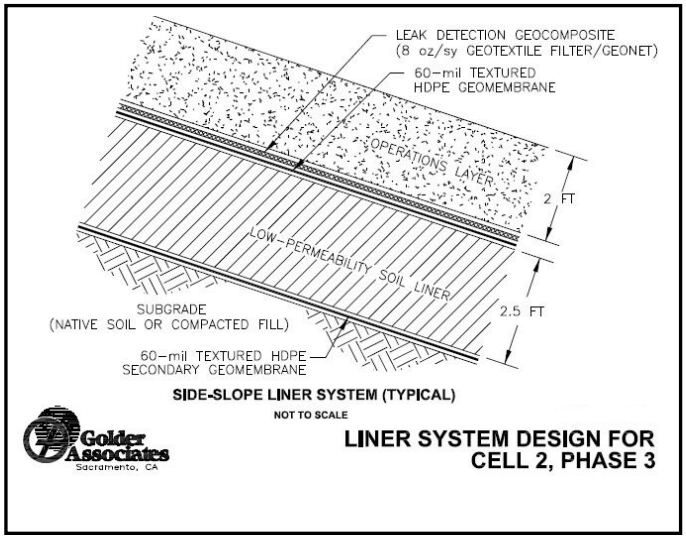
14 March 2017 Groundwater Elevation Contour Map

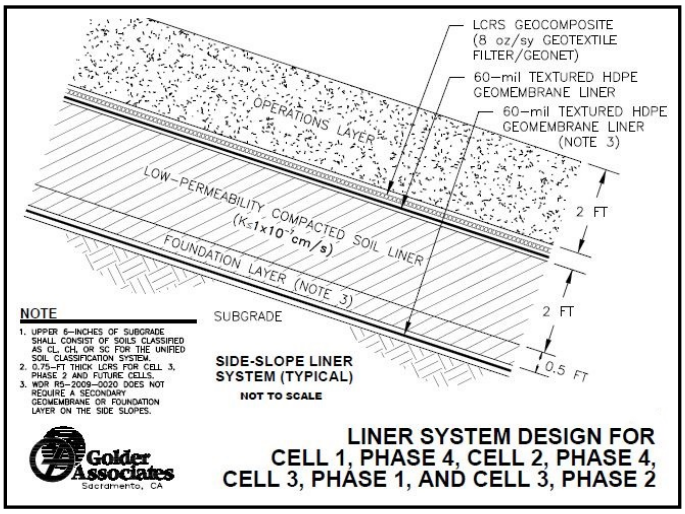


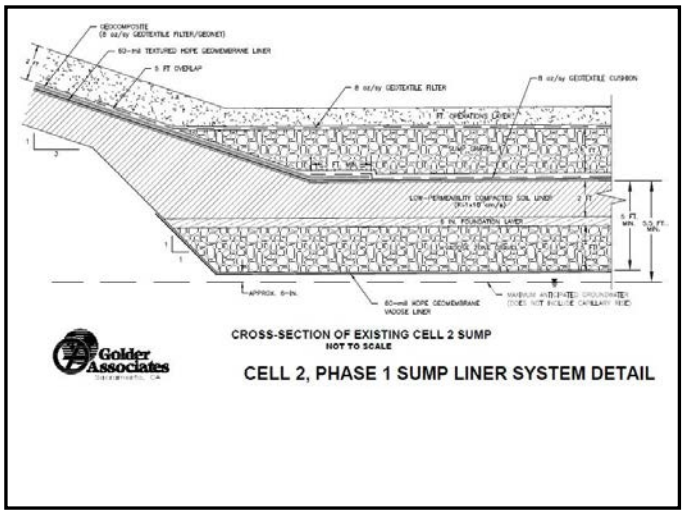
12 June 2017 Groundwater Elevation Contour Map

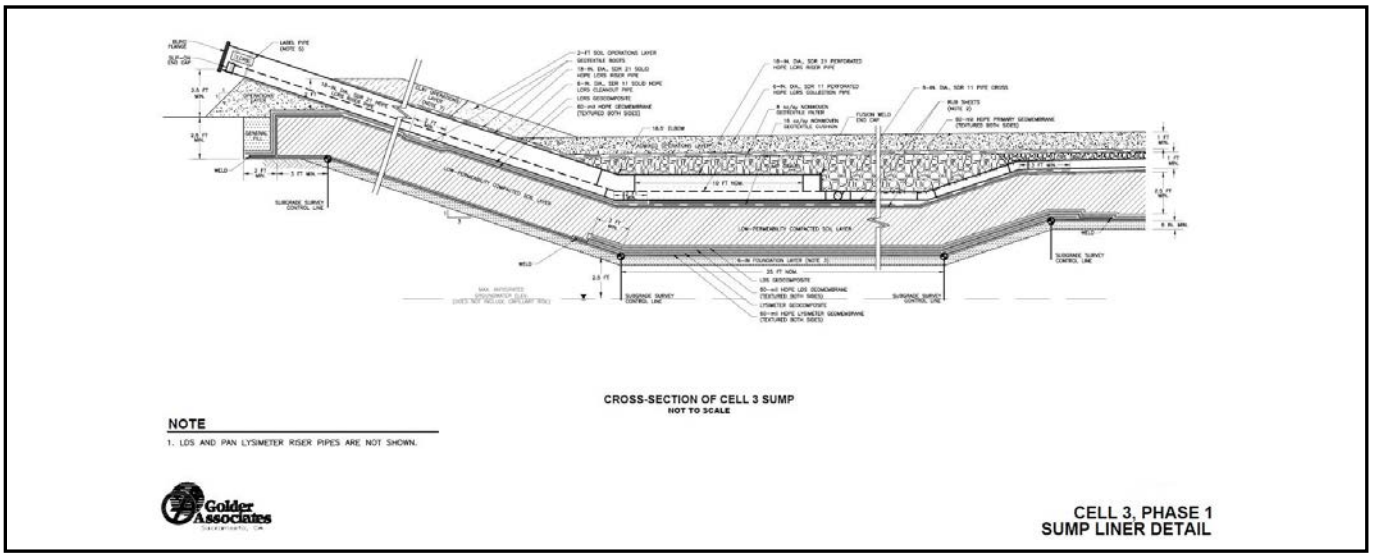
Drawing Reference: 1st Semiannual Monitoring and Reporting Program Report. Figure 2 and 3, Monitoring Locations and Groundwater Elevation Contour Maps Golder Associates	**REGIONAL AND SHALLOW GROUNDWATER ELEVATION CONTOUR MAPS** RECOLOGY OSTROM ROAD, INC. RECOLOGY OSTROM ROAD LANDFILL YUBA COUNTY	





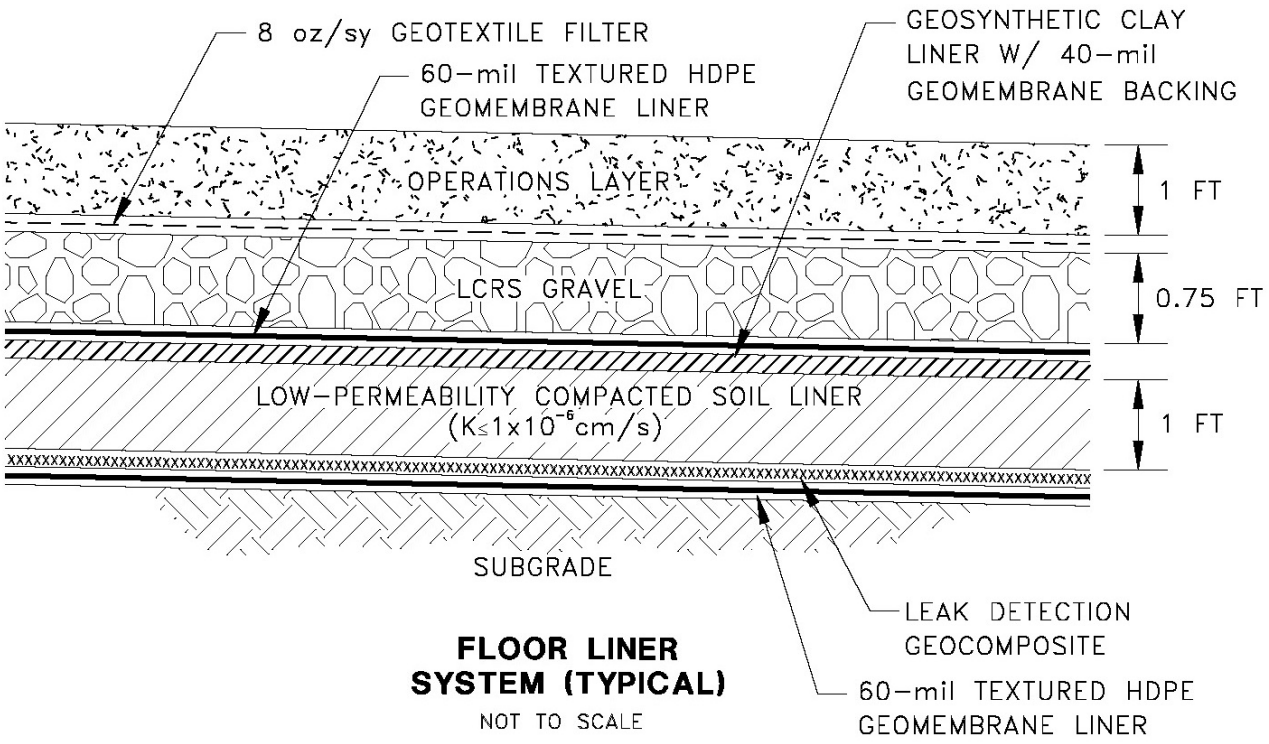






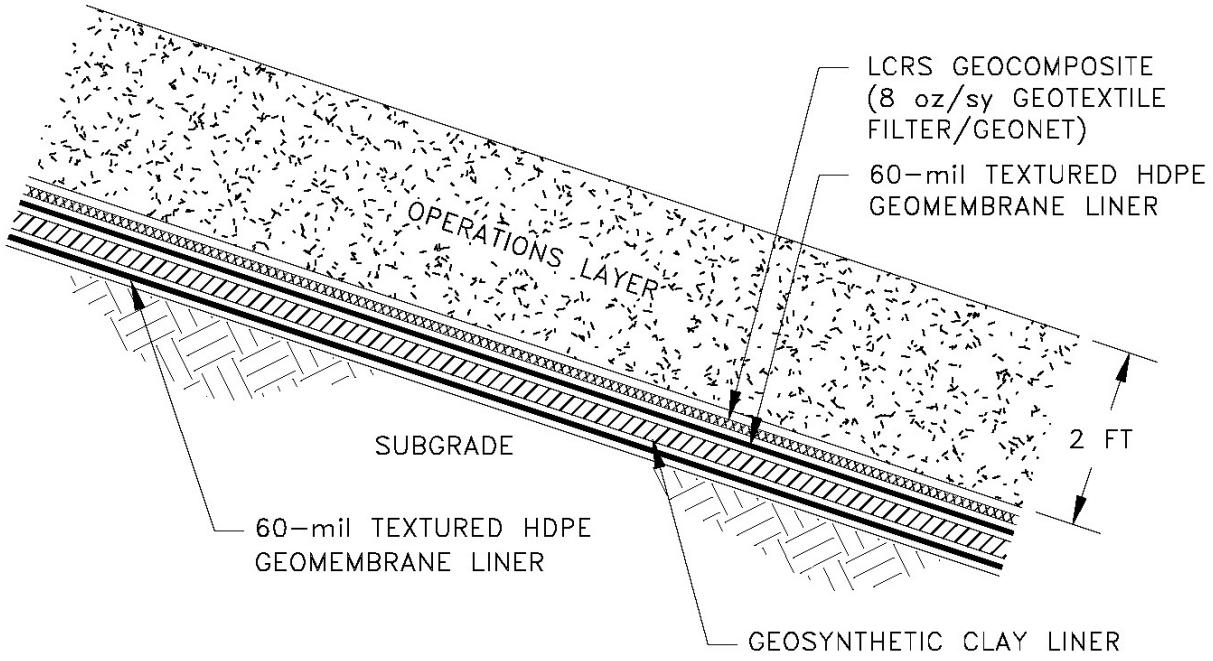
Drawing Reference:
Joint Technical Document (Rev. 10)
Figure 5 – Liner Designs
Golder Associates

SIDE SLOPE AND SUMP LINER DESIGN
RECOLOGY OSTROM ROAD, INC.
RECOLOGY OSTROM ROAD LANDFILL
YUBA COUNTY



FLOOR LINER SYSTEM (TYPICAL)

NOT TO SCALE



SIDE-SLOPE LINER SYSTEM (TYPICAL)

NOT TO SCALE

Golder Associates
Sacramento, CA

PROPOSED ENGINEERED ALTERNATIVE LINER DESIGN

Drawing Reference: Joint Technical Document (Rev. 10) Figure 5-6	**PROPOSED ENGINEERED ALTERNATIVE LINER DESIGN** RECOLOGY OSTROM ROAD, INC. RECOLOGY OSTROM ROAD LANDFILL YUBA COUNTY

INFORMATION SHEET

ORDER R5-2018-0007
RECOLOGY OSTROM ROAD
RECOLOGY OSTROM ROAD LANDFILL
CLASS II LANDFILL, CLASS II SURFACE IMPOUNDMENTS, AND BIOSOLIDS SLUDGE DRYING BEDS
CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE MAINTENANCE AND CORRECTIVE ACTION

RECOLOGY OSTROM ROAD; RECOLOGY OSTROM ROAD LANDFILL; CLASS II LANDFILL; CLASS II SURFACE IMPOUNDMENTS; AND BIOSOLIDS SLUDGE DRYING BEDS; YUBA COUNTY

The active landfill facility is a municipal solid waste (MSW) landfill regulated pursuant to Water Code section 13000 et seq., California Code of Regulations, title 27 (Title 27), section 20005 et seq. and Code of Federal Regulations, title 40, part 258; and in accordance with State Water Resources Control Board Resolution 93 62.

The Facility is located in unincorporated Yuba County and is immediately south of Ostrom Road approximately six miles east of State Highway 65 and one mile east of Jasper Lane. The 261-acre Facility has been in operation since 1995, and to date, approximately 70 acres has been constructed and approved for operation. The facility currently consists of one landfill waste management unit (WMU) classified as Class II for the discharge of non-hazardous waste, MSW, and designated waste, and is permitted for future Class II surface impoundment(s) and biosolids sludge drying beds.

Subsequent to the issuance of WDRs R5-2009-0020 on 5 February 2009, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) reviewed engineering design reports, construction quality assurance reports, existing operations and historical monitoring results. The Central Valley Water Board has determined that revision of existing WDRs is necessary to address the following items, *inter alia*:

1. Requirement for two percent (minimum one percent) post settlement slope on the base of the landfill to ensure proper functionality of its leachate collection and removal system throughout the life of the WMU.
2. Requirement that the Discharger maintains 2.5 feet separation between highest anticipated groundwater elevation including capillary fringe and waste along the base and side slopes of new and existing WMUs.
3. Provisions requiring the Discharger to submit a preliminary base and side slope liner design and unsaturated zone monitoring system for future WMU cells that complies with items 1 and 2 above.
4. Corrective action for groundwater separation, and ongoing release of volatile organic compounds (VOCs) from WMU 1 to the unsaturated and groundwater zones.
5. Requirement that the Discharger to perform a revised leachate and gas condensate water balance to prevent excessive head on the WMU primary liner.
6. Reevaluation of landfill stability based on existence of shallow groundwater zone along the side slopes and base of WMU cells.
7. Specifications for management of wastes at a proposed Biosolids Management Facility (BMF).
8. Revised specifications for minimum final closure cover requirements.

The revised WDRs address these items as well as others in order to ensure compliance with existing laws and regulations related to protection of water quality.

VKJ

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.)

December 2015

TABLE OF CONTENTS

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. 2014-0057-DWQ (Industrial General Permit) 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 LCRS 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 <u>all</u> 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 in 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 <u>initial</u> 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)].

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS FOR WASTE DISCHARGE REQUIREMENTS FOR INDUSTRIAL FACILITIES REGULATED BY TITLE 27

(Title 27, § 20005 et seq.)

April 2016

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A. APPLICABILITY

1. These Standard Provisions and Reporting Requirements (SPRRs) are applicable to Class II surface impoundments, waste piles, and land treatment units 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.

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 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 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)].

2. The discharge of wastes outside of a waste management unit or portions of a unit specifically designed for their containment is prohibited.

3. The discharge of waste to a closed waste management unit is prohibited.

4. The discharge of waste constituents to the unsaturated zone or to groundwater is prohibited, except within the treatment zone at a land treatment unit.

5. 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 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. Wastes shall be discharged only into waste management units specifically designed for their containment and/or treatment, as described in this Order.

4. The discharge shall remain within the designated disposal area at all times.

5. 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. 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)].

4. 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.

5. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

6. 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.

7. The Discharger shall maintain the depth of the fluid in the sump of each waste management 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).

8. 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)].

9. The Discharger shall maintain a *Storm Water Pollution Prevention Plan* and *Monitoring Program and Reporting Requirements* in accordance with State Water Board Order No. 2014-0057-DWQ (or most recent general industrial storm water permit), or retain all storm water on-site.

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 Class II waste management units that include the following:

    a. Detailed construction drawings showing all required liner system components, the LCRS, leachate sump, unsaturated zone monitoring system, 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 waste management unit (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, sections 21760(b) and 20375(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 II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].

8. All 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 [Title 27, § 20370(a)].

9. The Discharger shall perform stability analyses that include components to demonstrate the integrity of the waste management unit foundation, final slopes, and containment systems under both static and dynamic conditions throughout the life of the unit [Title 27, § 21750(f)(5)].

10. New Class II Units, other than LTUs and expansions of existing Class II units, shall have a 200 foot setback from any known Holocene fault. [Title 27, § 20250(d)].

11. Liners shall be designed and constructed to contain the fluid, including 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 any 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. 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.

16. The Discharger shall propose an electronic leak location survey of the top liner for any new waste management unit in the construction quality assurance plan unless the Discharger demonstrates that a leak location survey is not needed.

17. Leachate collection and removal systems are required for Class II surface impoundments [Title 27, § 20340(a)].

18. 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)].

19. Leachate collection and removal systems shall be designed and operated to function without clogging through the life of the waste management unit.

20. 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)].

21. 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].

22. 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)].

23. 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.

24. The Discharger shall notify Central Valley Water Board staff at least **14 days** prior to commencing field construction activities including construction of a new Class II waste management unit, construction of a final cover (for units closed as a landfill), or any other construction that requires Central Valley Water Board staff approval under this Order.

25. 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 Class II waste management unit. 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.

26. 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.

G. STANDARD CLOSURE AND POST-CLOSURE SPECIFICATIONS

1. 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, future land use, and a construction quality assurance plan [Title 27, § 21769(c) & (d)].

2. 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)].

3. The final cover of waste management units closed as a landfill shall be designed, graded, and maintained to prevent ponding and soil erosion due to high run-off velocities [Title 27, § 21090(b)(1)(A)].

4. The final grading design shall be designed and approved by a registered civil engineer or certified engineering geologist [Title 27, § 21090(b)(1)(C)].

5. All final cover designs shall include a minimum 1-foot thick erosion resistant vegetative layer or a mechanically erosion-resistant layer [Title 27, § 21090(a)(3)(A)(1 & 2)].

6. 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)].

7. The Discharger shall design storm water conveyance systems for Class II units that are closed as a landfill for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].

8. Construction or repair of a 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)].

9. 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 units that are closed as a landfill shall be maintained in accordance with an approved post-closure maintenance plan [Title 27, § 21710(c)(6)].

10. The post-closure maintenance period for units closed as a landfill 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)].

11. The Discharger shall periodically inspect and identify problems with the final cover including areas that require replanting, erosion, areas lacking free drainage, and any areas damaged by equipment operations [Title 27, § 21090(a)(4)(B)].

12. The Discharger shall repair any 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)].

H. STANDARD FINANCIAL ASSURANCE PROVISIONS

1. The Discharger shall establish an irrevocable fund (or provide other means) for closure to ensure closure of each Class II unit in accordance with an approved closure 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) 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)].

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 Class II waste management unit 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 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)].

19. 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)].

20. 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)].

21. The Discharger shall submit a work plan for review and approval at least **60 days** prior to installation or abandonment of groundwater monitoring wells.

22. 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.

23. 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].

24. 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).

25. 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)].

26. 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)].

27. 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.].

28. 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.].

29. 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)].

30. 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)].

31. An unsaturated zone monitoring system shall be established for each waste management unit [Title 27, § 20415(d)].

32. 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)].

33. 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)].

34. Groundwater elevation, temperature, electrical conductivity, turbidity, and pH are to be accurately measured at each well each time groundwater is sampled [Title 27, § 20415(e)(13)].

35. 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)].

36. 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)].

37. 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)].

38. 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.

39. 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.

40. 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, Article 19 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".

41. 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).

42. 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.

43. **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.44 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.45 provides the procedure for analytes that are detected in 10% or greater of the background samples such as naturally occurring constituents like chloride.

44. **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.44.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.

45. **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 in 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.45.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)(8)(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.45.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.

46. **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.44 or I.45, 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 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)].

   c. **Within 180 days** of confirming measurably significant evidence of a release, the Discharger shall submit to the Central Valley Water Board an <u>initial</u> 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)].

   d. 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)].

e. **Within 90 days** of the date that the Evaluation Monitoring Program from paragraph J.1.b 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)].

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 leachate generated by discharged waste during the active life, closure, and any 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. The Discharger shall design storm water conveyance systems for Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].

2. 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)].

3. Precipitation on Class II 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)].

4. 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 through the use of energy dissipators where required to decrease the velocity of runoff, slope protection, and other erosion control measures where needed to prevent 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.

    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.

5. 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)].

6. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].

7. 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)].

8. Any drainage layer in a 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)].