CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2016-0094

WASTE DISCHARGE REQUIREMENTS FOR COUNTY OF YOLO DEPARTMENT OF COMMUNITY SERVICES YOLO COUNTY CENTRAL LANDFILL CLASS III LANDFILLS, CLASS II SURFACE IMPOUNDMENTS, AND COMPOSTING CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE MAINTENANCE, AND CORRECTIVE ACTION YOLO COUNTY

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

1. The County of Yolo, Department of Community Services, (hereinafter Discharger) owns and operates the Yolo County Central Landfill, a Class III municipal solid waste (MSW) disposal facility with Class II surface impoundments (facility, site) about four miles northeast of Davis and three miles southeast of Woodland, near the intersection of Roads 28H and 104 in Yolo County, as shown in Attachment B. The site covers 725 acres in Sections 29 and 30, T9N, R3E, MDB&M, corresponding to Assessor's Parcel Numbers (APNs) 042-140-01, 042-140-02, and 042-140-06. The facility is a municipal solid waste (MSW) landfill regulated under authority given in Water Code section 13000 et seq.; California Code of Regulations, title 27 ("Title 27"), section 20005 et seq.; and 40 Code of Federal Regulations section 258 (aka, "Subtitle D") in accordance with State Water Resources Control Board (State Water Board) Resolution 93-62. The landfill has been in operation since 1975, servicing the incorporated and unincorporated areas of Yolo County and surrounding region.

2. The following documents are attached to this Order and hereby incorporated into and made a part of this Order by reference:

    a. Attachment A – Table of Contents
    b. Attachment B – Site Location Map
    c. Attachment C – Site Plan Map
    d. Attachment D – Surrounding Well Map
    e. Attachment E – Facility Monitoring Map
    f. Attachment F – Stormwater Drainage Map
    g. Attachment G – Landfill Gas Collection System
    h. Information Sheet

3. The following acronyms and terms are used throughout this Order:

ADC	Alternate Daily Cover
C&D	Construction and Demolition Processing and Transfer Facility
CGO	Composting General Order
RD&D	Research, Development, and Demonstration
USEPA	United States Environmental Protection Agency
WMU	Waste Management Unit

Anaerobic Compost Cell – An approximately 0.5 acre, composite lined cell built on top of a composite lined landfill WMU used for composting food and green waste materials. The cell is operated in anaerobic conditions by the addition of liquids and a cover then converted to aerobic conditions for the last few weeks of curing.

Bioreactor – A landfill WMU that is operated in anaerobic conditions by the use of addition of liquids (allowed under the USEPA RD&D Permit) and a cover.

Liquid Digester – Surface Impoundment WMU H2 will be covered with a geomembrane cover an operated in anaerobic conditions.

4. The existing and future landfill area is approximately 474 acres of which approximately 208 acres have been constructed. Class III landfill Waste Management Units (WMUs) 1 thorough 5 cover approximately 123.5 acres and include unlined WMUs 1 through 4 and clay-lined WMU 5. WMUs 1 and 2 were brought to final grade and closed in 2012 and 2015. WMU 3 was closed in 2007. WMUs 4 and 5 are currently still accepting waste to reach final grade for closure. Class III landfill WMUs 6 and 7 will cover an area of approximately 349.5 acres and currently consist of composite-lined Modules 6A through 6D covering approximately 84 acres within WMU 6. Future landfill modules will consist of WMUs 6E through 6H and WMUs 7I through 7P which will also have composite liners. The existing and future permitted landfill area is shown in Attachment C.

5. Currently two bioreactor projects have been conducted at the Site. A small bioreactor pilot project is located within WMU 6B. WMU 6D, Phase 1 has been operated as a bioreactor demonstration project through a waiver on the addition of supplemental liquids granted by the United States Environmental Protection Agency (USEPA) under the Project XL program, which has been completed. WMU 6D, Phase 1 contains one aerobic bioreactor cell and two anaerobic bioreactor cells. The Discharger plans on continuing to operate WMU 6D, Phase 1 as a bioreactor by recirculating leachate in WMU 6D, Phase 1. WMU 6D, Phase 2 has been constructed and filled as an anaerobic bioreactor cell, but is not covered under the USEPA waiver and has therefore not yet been operated as a bioreactor. Future landfill modules are planned to be operated as bioreactors.

6. The Class II surface impoundments are WMUs G and H. The former clay-only liner system in WMU G was replaced with a composite liner system in 1995 and the impoundment has a capacity of 1.5 million gallons. WMU H, completed in 1999,

consists of three hydraulically connected ponds, (H1, H2, and H3), as shown in Attachment C. H3, the large pond, covers five-acres and has a capacity of 10.7 million gallons. H1 and H2 each cover 2.5 acres each and have a capacity of 3.4 million gallons each. All three surface impoundments at WMU H are hydraulically connected by overflow weirs and piping to form one WMU. WMU F, a surface impoundment described in previous waste discharge requirements (WDRs), has been decommissioned and converted into a geosynthetic-lined water storage pond.

7. On 17 February 2016, the Discharger submitted an amended Report of Waste Discharge (ROWD) as part of the Joint Technical Document (JTD) for the landfill. The information in the ROWD/JTD has been used in updating these WDRs. The ROWD contains the applicable information required in Title 27. The ROWD/JTD and supporting documents contain information related to this update of the WDRs including:

   a. Developing an engineered alternative design for maintaining groundwater separation for future landfill modules WMUs 6E through 6H and WMUs 7I through 7P.

   b. Adding a compost receiving, processing and storage area at the Wood and Yard Waste Facility.

   c. Establishing anaerobic compost cells on composite lined landfill modules.

   d. Covering WMU H2 with a geosynthetic liner to create an anaerobic liquid digester and collect methane gas under the cover for power generation.

8. On 6 December 2007, the Central Valley Water Board issued Order R5-2007-0180 in which the landfill waste management units at the facility were classified as Class III units for the discharge of non-hazardous waste and municipal solid waste and surface impoundments classified as Class II units for the discharge designated waste. This Order continues to classify the landfill units as Class III and surface impoundments as Class II units in accordance with Title 27.

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

WMU	Year Built/ Size	Liner/LCRS[1] Components[2]	Class/ GW Separation	Status
1	1975 23.2 acres	Unlined. Subgrade sloped for leachate drainage to perimeter trench	Class III 5-feet GW separation	Closed
2	1977 40.0 acres	Unlined. Subgrade sloped for leachate drainage to perimeter trench	Class III 5-feet GW separation	Closed

WMU	Year Built/ Size	Liner/LCRS[1] Components[2]	Class/ GW Separation	Status
3	1981 20.7 acres	Unlined. Subgrade sloped for leachate drainage to perimeter trench	Class III 5-feet GW separation	Closed
4	1983 8.7 acres	Unlined. Subgrade sloped for leachate drainage to perimeter trench	Class III 5-feet GW separation	Active[3]
5	1988 30.9 acres	Operations layer (one foot of soil) Dendritic LCRS - lateral trenches containing gravel & perforated pipe draining via longitudinal trenches and a trunk line to a pump station. Two feet of compacted clay ($k \leq 1 \times 10^{-6}$ cm/sec)	Class III 5-feet GW separation	Active[3]
Module 6A	1991 20.2 acres	Operations layer (one foot of soil) Blanket type LCRS –geonet draining via longitudinal trenches to perimeter trunk line [5] 60-mil HDPE liner Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec)	Subtitle D prescriptive liner EAD[6] 3-feet GW separation	Active[4]
Module 6B	1993 20.0 acres	Operations layer – one foot of soil Geotextile cushion Blanket type LCRS –geonet draining via longitudinal trenches to perimeter trunk line [5] 60-mil HDPE liner 1.7 to 2.5 feet of compacted clay ($k \leq 1 \times 10^{-8}$ cm/sec)	Subtitle D prescriptive liner EAD 3-feet GW separation	Active

WMU	Year Built/ Size	Liner/LCRS[1] Components[2]	Class/ GW Separation	Status
Module 6C	1996 19.3 acres	Operations layer – one foot of soil Geotextile cushion Blanket type LCRS –geonet draining via longitudinal trenches to perimeter trunk line [5] 60-mil HDPE liner Two feet of compacted clay ($k \leq 1 \times 10^{-7}$cm/sec) Three feet earthfill 40-mil HDPE liner (capillary break)	Class III EAD 5-feet GW separation with a reduction to 3-feet below the LCRS trenches and sumps	Active
Module 6D Phase 1	1999 12.0 acres	Same as WMU 6C except: Operations layer – three feet of shredded tires ($k \geq 1$ cm/sec) Cushion layer – six inches of pea gravel [7] Blanket LCRS - geotextile bonded to both sides of geonet, drains via longitudinal trenches to interior sumps[1]	Class III EAD 5-feet GW separation with a reduction to 3-feet below the LCRS trenches and sumps	Active
Module 6D Phase 2	2002 12.7 acres	Operations layer – three feet of shredded tires or one foot of soil Geotextile filter layer LCRS – 1 foot thick layer gravel [7] Primary Liner - 60-mil HDPE geomembrane Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec) Three feet of compacted earthfill Leak detection geocomposite drainage layer 40-mil HDPE geomembrane liner	Class III EAD 5-feet GW separation with a reduction to 3-feet below the LCRS trenches and sumps	Active

WMU	Year Built/ Size	Liner/LCRS[1] Components[2]	Class/ GW Separation	Status
Modules 6E-6H & 7I-7P	Future 265.5 acres	Operations layer – one foot of soil, or three feet of shredded tires, or two feet of 6-inch minus ground wood following written Executive Officer approval Geotextile filter layer LCRS – 1 foot thick layer gravel [7] Primary Liner - 60-mil HDPE geomembrane Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec) Three feet of compacted earthfill Leak detection geocomposite drainage layer 40-mil HDPE geomembrane liner	Class III EAD 5-feet GW separation with a reduction to 3-feet below the LCRS trenches and sumps	Future
G Surface Impoundment	1995 2.0 acres 1.5 MG	Southern half lined inside with compacted concrete. A concrete wall separates the northern and southern halves. Primary liner - 60-mil HDPE geomembrane ($k \leq 1 \times 10^{-7}$ cm/sec) Blanket LCRS – geonet, drains via longitudinal trenches to interior sumps Secondary liner - 40-mil HDPE geomembrane Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec) One to three feet earthfill, 40-mil HDPE geomembrane (capillary break)	Class II EAD 5-feet GW separation with a reduction to 2-feet below the LCRS trenches and sumps	Active

WMU	Year Built/ Size	Liner/LCRS[1] Components[2]	Class/ GW Separation	Status
H Surface Impoundment	H1 & H2 2.5 acres each 3.4 MG each H3 5 acres 10.7 MG	All three impoundments hydraulically connected by overflow weirs and pipes which allow pumping from one to the other Primary liner - 60-mil HDPE geomembrane ($k \leq 1 \times 10^{-7}$ cm/sec) Blanket LCRS – geonet, drains via longitudinal trenches to interior sumps Secondary liner - 40-mil HDPE geomembrane Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec) One to three feet earthfill, 40-mil HDPE geomembrane (capillary break)	Class II EAD 5-feet GW separation with a reduction to 2-feet below the LCRS trenches and sumps	Active

[1] LCRS – Leachate collection and removal system

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

[3] WMUs 4 and 5 may receive waste to reach final grade for closure. The 31 July 2013 Cease and Desist Order R5-2011-0076 Extension Letter requires closure of WMUs 4 and 5 by 15 October 2019.

[4] WMU 6A is currently inactive and will become active when filling begins to bring WMU 5 and WMU 6 to final grades for closure.

[5] LCRS trenches and sump areas have double-composite liner.

[6] Engineered Alternative Design (EAD)

[7] Regional Water Board staff may approve other materials in lieu of pea gravel upon a demonstration by Discharger that they will provide adequate drainage and will not damage the geomembrane.

10. On-site facilities at the Yolo County Central Landfill include: an active landfill gas extraction system, a landfill gas-to-energy plant, a landfill gas flare, a materials recovery facility, a groundwater extraction and treatment system, a green waste processing facility, a concrete and asphalt debris facility, a metal recovery facility, C&D, a food waste receiving and processing area on top of a composite lined landfill unit, and a household hazardous waste drop-off facility. The Discharger proposes to construct anaerobic compost cells, a new food waste processing and transfer area, and a public reuse facility.

11. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated federal MSW regulations under the Resource Conservation and Recovery Act (RCRA), Subtitle D. These regulations are under 40 Code of Federal Regulations section 258, and are hereafter referred to as either “Subtitle D” in reference to the RCRA

federal law that required the regulations or "40 C.F.R. section 258.XX". These regulations apply to all California Class II and Class III landfills that accept MSW. State Water Board Resolution 93-62 requires the Central Valley Water Board to implement in WDRs for MSW landfills the applicable provisions of the federal MSW regulations that are necessary to protect water quality, and in particular the containment provisions and the provisions that are either more stringent or that do not exist in Title 27.

12. This Order implements the applicable regulations for discharges of solid waste to land through Prohibitions, Specifications, Provisions, and monitoring and reporting requirements. Prohibitions, Specifications, and Provisions are listed in Sections A through H of these WDRs below, and in the Standard Provisions and Reporting Requirements (SPRRs) dated December 2015 which are part of this Order. Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) R5-2016-0094 and in the SPRRs. In general, requirements that are either in regulation or otherwise apply to all MSW landfills are considered to be "standard" and are therefore in the SPRRs. Any site-specific changes to a requirement in the SPRRs are included in the applicable section (A through H) of these WDRs, and the requirement in the WDRs supersedes the requirement in the SPRRs.

13. 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.

14. On 4 August 2015, the State Water Resources Control Board adopted *General Waste Discharge Requirements for Composting Operations Order No. WQ 2015-0121-DWQ* (Composting General Order or CGO) applicable to various types of composting operations, including, but not limited to, facilities that compost green waste and food waste. One of the purposes of the CGO was to prescribe uniform and consistent waste discharge requirements for similar types of composting operations consistent with the Water Code, Title 27, and applicable regulations in order to protect water quality. The CGO required that new and existing composting operations submit a technical report describing their composting operations along with a Notice of Intent to comply with the CGO.

15. These WDRs prescribe waste discharge requirements for both the landfill and the proposed anaerobic composting activities. The Discharger is therefore not required to obtain coverage under the CGO for the anaerobic composting activities. The Discharger may need to obtain coverage under the CGO if the composting activities are expanded in the future to include activities not covered by these WDRs.

WASTE CLASSIFICATION AND UNIT CLASSIFICATION

Landfill WMUs

16. The Discharger proposes to continue to discharge nonhazardous solid waste, including municipal solid waste, grit and screening wastes, and dewatered sludge to lined and/or unlined Class III landfill units at the facility. Grit and screening wastes and dewatered sludge may only be discharged to units that have composite liner systems. Non-friable asbestos will also be accepted for discharge to non-bioreactor units that have composite liner systems (WMUs 6A, 6B, and 6C). These classified wastes may be discharged only in accordance with Title 27, Resolution 93-62, and Subtitle D as required by this Order.

17. WMU 4 is an active unlined landfill unit at the facility that is an "existing unit" under Title 27 that was permitted before 27 November 1984. WMU 5 is an active landfill unit at the facility with a pre-Subtitle D liner system. WMU 4 and WMU 5 may continue to accept waste in the "Existing Footprint" until ready for closure unless waste receipts do not meet the timeframes and amounts in Title 27, section 21110, or they are required to close sooner to address environmental impacts or other regulatory concerns. The 31 July 2013 Cease and Desist Order R5-2011-0076 Extension Letter requires closure of WMU 4 and 5 by 15 October 2019. The "Existing Footprint" as defined in Title 27, section 20164 is the area that was covered by waste as of the date that the landfill unit became subject to Subtitle D. The Existing Footprint for the active unlined areas of the landfill is shown on Attachment C.

18. The Discharger proposes to continue to accept inert wastes and drilling wastes that are exempt from Title 27 requirements. Inert wastes are evaluated and/or tested to confirm they are inert prior to acceptance. Drilling wastes are evaluated and/or tested to confirm the wastes meet the exemption requirements of Title 27, Section 20090(g) prior to being discharged into a sump(s) at the Inert Recycling Facility and later excavated for use as Daily Cover.

19. Liquid wastes are accepted at a liquids receiving area consisting of enclosed tanks located on an asphalt paved surface. This area is exempt from Title 27, Section 20090(i) for fully enclosed units. The Discharger proposes to collect and process containerized food waste with a de-packaging unit and dewater sludge with a filter press. These activities are not fully enclosed and not exempt from Title 27. This Order requires the pad to meet the requirements in Construction Specification D.14 prior to accepting and processing containerized food waste with a de-packaging unit and dewatering sludge with a filter press in this area.

20. 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

21. 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.

22. The Discharger uses the following materials for ADC: temporary geosynthetic tarps, processed green materials, sludge and sludge-derived materials, processed construction and demolition waste, dewatered concrete grindings, and spray applied product. 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. In the future, the Discharger proposes to use the decomposed residual material from the mining of bioreactor units as ADC; however, this Order requires that such material be used only in internal areas of the landfill such that any stormwater does not drain to surface water.

23. 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. The approved ADC materials should then be listed in the facility's WDRs during the next regular update or revision with information about the Discharger's demonstration. 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.

24. The Discharger proposes to use an Alternate Intermediate Cover to conserve soil and beneficially reuse waste materials. Title 27, section 20686 includes regulations for beneficial reuse, including use of Alternate Intermediate Cover. Approval of Alternate Intermediate Cover is primarily handled by the LEA and CalRecycle under Title 27, section 20700. This Order allows any Alternate Intermediate Cover 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. The approved Alternate Intermediate Cover materials should then be listed in the facility's WDRs during the next regular update or revision with information about the Discharger's demonstration. This Order also includes a requirement that Alternate Intermediate Cover only be used in internal areas of the landfill.

25. When the Discharger is not utilizing the liquids variance for bioreactor landfill units detailed in Finding 97, the Discharger proposes to return leachate and landfill gas

condensate to the composite-lined landfill units from which they came. Title 27, section 20340(g) requires that leachate be returned to the unit from which it came or be discharged in a manner approved by the Regional 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 (i.e. leachate and landfill gas condensate from WMU 6 returns to WMU 6 and from WMU 7 returns to WMU 7). This Order and the SPRRs include 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, and will not seep from the edges of the units.

26. Leachate from the unlined WMUs and WMU 5 is conveyed via trunk line to Pump Station No. 1, while leachate from WMUs 6A, 6B, and 6C is conveyed to Pump Station No. 2. Both pump stations pump to WMU G or H. Leachate from WMU 6D is conveyed directly to WMU G or H from its four leachate sumps. Liquid from each surface impoundment's LCRS is returned to that impoundment. Leachate and condensate collected in WMUs G and H is disposed of through evaporation, supplemental liquid injection into the bioreactors, anaerobic compost cells, or to the City of Davis WWTP under an industrial discharge permit.

Composting

27. The Discharger proposes to continue to receive, process and transfer food waste and yard waste to an offsite compost facility or to onsite anaerobic compost cells. Proposed materials accepted at the food waste processing and transfer facility includes food, agricultural, green, and vegetative material as defined in the CGO. Currently, the Discharger stockpiles less than 500 cubic yards at any one time on an operations pad consisting of an all-weather surface located on top of a composite lined landfill unit. Food waste is blended and mixed with yard waste such that the mixture will not contain more than 15% food material. Within 48 hours of receipt of food waste, the bunker of material will be processed through a grinder and transferred offsite to a permitted composting facility or to an onsite anaerobic compost cell. This Order requires the operations pad for accepting food waste to be maintained to continue to meet the requirements of Construction Specification D.15 to D.22.

28. The Discharger also proposes to accept and process food waste in the Wood and Yard Waste Facility. This Order requires the Wood and Yard Waste Facility to meet the requirements in Construction Specification D.14, prior to accepting, processing, or storing food waste in the Wood and Yard Waste Facility.

29. The Discharger is proposing to construct seven anaerobic compost cells on top of WMU 6D. The proposed feedstocks for the anaerobic compost cells are agricultural material,

green material, food material, vegetative food material, or liquid food material, as defined in the CGO, and non-hazardous digestate from the liquid digester WMU H2. Manure and waste water sludge will be added to start the anaerobic digestion phase and the cells will be covered with soil or Alternate Intermediate Cover. During the anaerobic digestion phase biogas will be collected for energy production. After approximately 22 weeks of anaerobic operation, the cells will then undergo 2 weeks of aerobic composting. Following decomposition, the cells are excavated and the compost material is screened, allowed to cure, and then marketed.

30. The compost materials excavated from the anaerobic compost cells may need to be placed in aerobic composting windrows for final curing before stockpiling the final compost product for sale. The Discharger proposes to conduct these activities on a composite lined landfill unit or at the Wood and Yard Waste Facility area. This Order requires these operations to be conducted on an operations pad meeting the requirements of Construction Specification D.14.

Surface Impoundments

31. The Discharger proposes to continue to discharge non-hazardous and designated liquid wastes to Class II surface impoundments units including landfill leachate, gas condensate, cooling water from the power plant, domestic and commercial septage, chemical toilet waste, water treatment lime sludge, concrete grinding slurry from roadway surfacing, carwash waste water, and other non-hazardous or designated liquids to the Class II surface impoundments. These classified wastes may be discharged only in accordance with Title 27, Resolution 93-62, and Subtitle D as required by this Order.

32. The surface impoundments are each equipped with aerators to promote aerobic treatment of the liquid wastes. Surface impoundment H-2 will be covered to promote anaerobic treatment of the liquid wastes. The Discharger proposes to beneficially reuse the liquid within the surface impoundments for dust control on composite lined landfill units and for additional water within bioreactor landfill units under the RD&D permit. This Order requires the Discharger to confirm that the water within the surface impoundments is characterized as non-hazardous prior to beneficially using the liquids.

33. Title 27 and Water Code section 13173 define “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 waste management unit, 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 waste management units, or at Class II waste management units which comply with Title 27 and have been approved by the regional board for containment of the particular kind of waste to be discharged.

SITE DESCRIPTION

34. The area topography is generally flat with a natural grade of approximately one foot of fall from north to south and six feet of fall from west to east. The natural elevation of the site is approximately 21 to 25 feet above mean sea level (MSL). The maximum final landfill elevation of WMUs 1 through 5 and 6A through 6D will be 81.4 feet MSL according to the NAVD 88 measurement system. The maximum final landfill elevation of WMUs 6E through 6H and 7I through 7P will be 141.4 feet MSL according to the NAVD 88 measurement system.

35. Land uses within 1,000 feet of the landfill include agriculture to the north (winter wheat, alfalfa and rice fields); a former wastewater disposal area to the west (used for spray disposal of cannery wastewater until October 1999, now used for cattle grazing and as a soil borrow area); City of Davis wastewater treatment plant ponds and wastewater reclamation fields to the east and south; and the Willow Slough Bypass Channel along the southern boundary. On the other side of the Willow Slough Bypass Channel is additional agricultural cropland. The nearest residence is located approximately 700 feet south of the landfill boundary.

36. There are 43 private wells within one mile of the site, including six for domestic supply, 17 for irrigation, two for livestock, one for industrial supply, eleven for monitoring, and seven unknown designation. The general locations of these wells relative to the facility are shown on Attachment D.

37. The soils underlying the site predominantly consist of low-permeability silty clays (90 to 100 percent passing the number 200 sieve). Test borings also show an interval of laterally discontinuous silty fine sands up to 12 feet thick between 6 and 35 feet below ground surface (bgs). This interval is known as the Upper Sand. Materials below 35 feet bgs are mostly clays, interspersed with minor amounts of inter-bedded sand and gravel, to a depth of about 80 feet bgs. More abundant coarse-grained material is encountered below 80 feet bgs. Due to the discontinuities, neither the Upper nor Lower Sands have been reliably correlated from well to well.

38. The measured hydraulic conductivity of the native soils underlying the landfill units ranges between 2.7×10^{-7} and 5.3×10^{-8} centimeters per second (cm/s).

39. There are no known active faults traversing or projected through the site. The principal seismic impact would be strong ground shaking generated by movement on one or more of the faults in the western Sierra foothill fault system, the San Andreas Fault system, and the blind thrust faults of the Sierran Block/Coast Range boundary, including the Vacaville/Winters seismic region, and the Dunnigan fault. The maximum peak ground

surface acceleration estimated to occur at the site is on the order of 0.32 g. The fault nearest the site is the Dunnigan fault about 11 miles northwest of the facility. The Maximum Credible Earthquake for this fault is estimated to be magnitude 6.25.

40. The facility receives an average of 19.76 inches of precipitation per year as measured at Davis between the years 1983 and 2005. About 96 percent of annual precipitation occurs between the months of October and April. The mean pan evaporation for this facility is 81.7 inches per year as measured at Davis 1 WSW Station between the years 1917 and 2005. Assuming a pan coefficient of 0.75, the site evaporation is 61.3 inches per year. Based on these data, average annual net evaporation at the facility is 41.5 inches.

41. The 100-year wet season precipitation for the facility is 31.1 inches and the 100–year, 24-hour precipitation event is 5.1 inches based on data from the National Oceanic and Atmospheric Administration's Hydrometeorological Design Studies Center for Davis 2 WSW EXP Farm Station.

42. The 1,000-year, 24-hour precipitation event for the facility is estimated to be 7.1 inches, based on data from the National Oceanic and Atmospheric Administration's Hydrometeorological Design Studies Center for Davis 2 WSW EXP Farm Station.

43. On the latest Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for Yolo County, dated November 2012, the site is identified as within Zone A, an area subject to 100-year flood events. Each waste management unit is protected from inundation of flood waters by soil levees. Perimeter levees are constructed around each cell between 26 and 33 feet MSL. This Order requires the Discharger to determine the required height to protect the WMUs from flooding events with a 100-year return period and demonstrate that WMUs are designed, constructed, and operated to prevent inundation or washout from this flood event.

44. Storm water retention basins are shown on Attachment F. The basins detain storm water for sedimentation control during the rainy season and are normally dry during the summer months. Site drainage and storm water containment are designed and constructed to have adequate capacity to contain a 100-year, 24-hour storm event.

SURFACE WATER AND GROUNDWATER CONDITIONS

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

46. Nearby surface waters include Willow Slough Bypass on the southern property boundary, Willow Slough about 2 miles to the north, Putah Creek approximately 4 miles to the south, Cache Creek approximately 6 miles to the north, and the Yolo Bypass (an overflow conveyance of the Sacramento River) 3 miles to the east. The Willow Slough

Bypass drains the southern part of the site and an unnamed canal drains the northern part of the site. The Willow Slough Bypass and the unnamed canal empty into the Yolo Bypass to the east, which drains to the Sacramento San Joaquin Delta.

47. The designated beneficial uses of the Sacramento San Joaquin Delta, as specified in the Basin Plan, are municipal and domestic supply; agricultural supply; industrial service supply; industrial process supply; water contact recreation; non-contact water recreation; warm fresh water habitat; cold freshwater habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; wildlife habitat; and navigation.

48. Surface water run-on from adjacent properties occurs along the southern landfill boundary from County Road 28H. All other sides of the facility have agricultural ditches (north), roadside ditches (west), drainage ditches and natural grading of topography (east) to prevent surface water run-on. On-site surface water flows to perimeter ditches of WMUs and is diverted to one of three storm water retention basins or the water storage reservoir, as shown in Attachment F. All surface water is contained, stored, and managed on-site as to prevent off-site discharge.

49. The landfill does not impact any jurisdictional waters of the United States (i.e., reservoirs, vernal pools and wetlands), other than the future filling of a ditch located in the WMU 7 area. This Order requires the Discharger to complete all demonstrations required for this discharge under 40 CFR 258.12(a) for Regional Water Board consideration in a future revision of the WDRs after the Discharger has completed CEQA, and obtained all necessary permits and a water quality certification.

50. The groundwater table beneath the site is naturally high and is additionally elevated from crop irrigation, and wastewater reclamation activities on adjacent lands. The water table ranges seasonally between 3 and 15 feet below ground surface (bgs), corresponding to 20 and 8 feet MSL. In addition, a capillary rise up to three feet has been measured. During wet years, groundwater has risen above the ground surface in some locations at the facility. A deeper aquifer underlies the shallow groundwater at about 80 feet bgs (-57 feet MSL).

51. Monitoring data indicate background groundwater quality for first encountered groundwater typically has electrical conductivity (EC) ranging between 1,300 and 3,000 micromhos/cm, with total dissolved solids (TDS) ranging between 1,000 and 2,000 milligrams per liter (mg/L).

52. The natural gradient of the shallow groundwater is to the south and southeast, but is reversed by operation of extraction wells along the northern property line, which pump continuously year-round. Under pumping conditions, the shallow gradient is toward the extraction wells, which is to the north/northwest for most of the site. The estimated average groundwater gradient is approximately 0.010 feet per foot per the 2014-2015 Annual Groundwater Monitoring report. The gradient may also be influenced by the wastewater reclamation and irrigation activities on surrounding lands.

53. As described in the Basin Plan, the beneficial uses of groundwater are municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.

GROUNDWATER AND UNSATURATED ZONE MONITORING

54. The groundwater monitoring system at the landfill consists of detection monitoring wells and corrective action monitoring wells. Additional monitoring wells will be installed as future modules are constructed. A complete listing of monitoring wells and their associated monitoring programs is given in MRP R5-2016-0094. The groundwater monitoring system is shown on Attachment E.

The current groundwater monitoring network consists of the following:

Detection Monitoring

Well	Status	Zone	Units Being Monitored
OW10	Background	Shallow	WMU 6A, 6B
LPTZA	Background	Shallow	WMU 6A
EW10	Detection	Shallow	WMU 6A, 6B, 6C, 6D
EW16	Detection	Shallow	WMU 6A, 6B, 6C, 6D
LTPZB	Background	Shallow	WMU 6B
LTPZC	Background	Shallow	WMU 6C
OW15	Background	Shallow	WMU 6C
LTPZD	Background	Shallow	WMU 6D
OW14	Background	Shallow	WMU 6D, H
OW23	Detection	Shallow	WMU 6D, H
SIMW5	Background	Shallow	WMU H
OW17	Background	Shallow	WMU H
SIMW4	Detection	Shallow	WMU H

Corrective Action Monitoring

Well	Status	Zone	Units Being Monitored
OW1	Background	Shallow	WMU 1, 2
OW4	Background	Shallow	WMU 1, 2
OW5	Background	Shallow	WMU 1, 2, 3
OW6	Background	Shallow	WMU 3
OW7	Background	Shallow	WMU 4, 5
OW24	Background	Shallow	WMU 4, 5
SIMW1	Background	Shallow	WMU G
OW3	Detection	Shallow	WMU 1, 2
OW17	Detection	Shallow	WMU 1, 2
OW18	Detection	Shallow	WMU 1, 2, G
OW26	Detection	Shallow	WMU 3

Well	Status	Zone	Units Being Monitored
OW27	Detection	Shallow	WMU 3
EW02	Detection	Shallow	WMU 4, 5
EW07	Detection	Shallow	WMU 4, 5
SIMW4	Detection	Shallow	WMU G
DW2	Detection	Deep	WMU 1, 2, G
DW8	Detection	Deep	WMU 1, 2
DW6	Detection	Deep	WMU 3
DW7	Detection	Deep	WMU 4, 5

55. At the time this Order was adopted, the Discharger's detection monitoring program for groundwater at the landfill satisfied the requirements contained in Title 27.

56. The unsaturated zone monitoring system at the landfill includes several pan lysimeters, suction lysimeters, and soil gas probes. Locations and designations of the unsaturated zone monitoring system are shown on Attachment E. The detection monitoring program for the unsaturated zone at the landfill satisfies the requirements contained in Title 27. The current unsaturated zone monitoring network of lysimeters consists of:

Mon Pt.	Status	Units Being Monitored
6B-N-LYS	Corrective Action	WMU 6B
6B-S-LYS	Corrective Action	WMU 6B
6C-N-LYS	Detection	WMU 6C
6C-S-LYS	Corrective Action	WMU 6C
6D1-E-LYS	Detection	WMU 6D1
6D1-W-LYS	Detection	WMU 6D1
6D2-E-LYS	Detection	WMU 6D2
6D2-W-LYS	Detection	WMU 6D2
G-LYS-1	Corrective Action	WMU G
G-LYS-2	Detection	WMU G
G-LYS-3	Detection	WMU G
H1-LYS	Detection	WMU H1
H2-LYS	Detection	WMU H2
H3-E-LYS	Detection	WMU H3
H3-W-LYS	Detection	WMU H3

Lysimeter 6C-N-LYS is no longer functioning, and the Discharger plans to install four new gas probes. One of these gas probes will replace Lysimeter 6C-N-LYS.

The current unsaturated zone monitoring network of gas probes consists of:

Mon Pt.	Status	Status	Units Being Monitored
P1	Existing	Detection	WMU 3
P2	Existing	Detection	WMU 2
P3	Existing	Detection	WMU 2

Mon Pt.	Status	Status	Units Being Monitored
P4A	Existing	Detection	WMU 2
P5	Existing	Detection	WMU 1
P6	Existing	Detection	WMU 1
P7	Existing	Detection	WMU 1
P8	Existing	Detection	WMU 3
P9	Proposed	Detection	WMU 5
P10	Proposed	Detection	WMU 6A
P11	Proposed	Detection	WMU H2
P12	Proposed	Detection	WMU 6C

57. Volatile organic compounds (VOCs) are often detected in a release from a MSW landfill and are often associated with releases of landfill gas rather than leachate. Since volatile organic compounds are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a landfill unit. Title 27, sections 20415(e)(8) and (9) allows the use of a non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a landfill unit in accordance with Title 27, sections 20415(b)(1)(B)2.-4. However, Title 27 does not specify a specific method for non-statistical evaluation of monitoring data.

58. The Central Valley Water Board may specify a non-statistical data analysis method pursuant to Title 27, section 20080(a)(1). Water Code section 13360(a)(1) allows the Central Valley Water Board to specify requirements to protect groundwater or surface waters from leakage from a solid waste site, which includes a method to provide the best assurance of determining the earliest possible detection of a release.

59. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a landfill unit, the SPRRs specify a non-statistical method for the evaluation of monitoring data for non-naturally occurring compounds. The specified non-statistical method for evaluation of monitoring data provides two criteria (or triggers) for making the determination that there has been a release of non-naturally occurring waste constituents from a landfill unit. The presence of two non-naturally occurring waste constituents above their respective method detection limit (MDL), or one non-naturally occurring waste constituent detected above its practical quantitation limit (PQL) [aka, 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.

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

    a. By calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or

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

61. The 2015 Annual Report summarizes the Water Quality Protection Standard (WQPS). Currently, the Discharger utilizes an intrawell statistical method because the groundwater pumping changes the direction of groundwater flow and sometimes the geochemistry changes in these areas when the groundwater flow direction changes. Intrawell statistics allows for the detection of COCs within each well while taking into account the geochemical fluctuations for each well. The Discharger also conducts intrawell statistics on background wells to detect off site impacts or regional aquifer changes. These WDRs require that the Discharger submit a complete WQPS Report describing the WQPS for each unit as required by Provision H.8.

GROUNDWATER DEGRADATION AND CORRECTIVE ACTION

WMUs 1 through 5

62. Groundwater on the western part of the site has been impacted by volatile organic compounds (VOCs) from one or more of the older unlined or clay lined landfill units (WMUs 1 through 5). After installation an air stripper unit in 1993, the Discharger began groundwater pump and treat using existing de-watering wells. The treated groundwater is discharged to land under WDRs R5-2002-0078. Since 2004, VOCs detected in the source area at observation well OW-27 include cis-1,2 dichloroethene (up to 16 micrograms per liter (µg/L)), 1,1-dichloroethane (up to 2.0 µg/L), tetrachloroethene (up to 2.0 µg/L), trichloroethane (up to 1.8 µg/L), and vinyl chloride (up to 0.98 µg/L). Since 1993, concentrations of total dissolved VOCs at OW-27 have declined from 52.8 µg/l to 1.2 µg/L as of March 2015. WMUs 1 through 5 remain in a Corrective Action Monitoring Program as specified in Monitoring and Reporting Program (MRP) R5-2016-0094.

WMUs 6B, 6C and G

63. Following the review of the 2001 Annual Monitoring Report, Regional Water Board staff issued a 10 April 2002 letter to the Discharger requiring them to prepare an Evaluation Monitoring Program (EMP) for WMUs 6B, 6C and G. This was due to the detection of several constituents-of-concern above the concentration limits in the unsaturated zone monitoring devices for these units. The Discharger submitted the proposed EMP in July 2002, and a revised EMP in August 2002 to address Regional Water Board staff comments. Following staff approval of the EMP on 10 September 2003, the Discharger submitted 29 March 2004 Report of Waste Discharge Proposing a Corrective Action Program for WMU 6B, WMU 6C, and WMU G. This report presented the results of the

EMP and where applicable, proposed a Corrective Action Program (CAP) for each WMU.

64. The EMP for WMU 6B included additional sampling of pan lysimeters 6B-S-LYS and 6B-N-LYS. This sampling confirmed the presence of three VOCs in 6B-S-LYS and six VOCs in 6B-N-LYS at low levels. The sampling also confirmed the presence of elevated levels of various inorganic constituents in these lysimeters. As a corrective action measure, the Discharger had already been pumping the liquid from these lysimeters and collecting samples. The liquid in the lysimeters drains through a pipe into a manhole located outside of the WMU. Therefore, liquid would not back up into the pan lysimeter so long as the level in the manhole is kept below the invert elevation of the pipe that goes into the manhole. Approximately 2,900 gallons were pumped from 6B-N-LYS in June 2002, and approximately 7,300 gallons were pumped from 6B-S-LYS in July/August 2002. Following this pumping, relatively little additional liquid has accumulated in or has been pumped from these lysimeters. The Discharger proposed to continue this practice as a corrective action measure in the future. During the first half of 2015, the Discharger pumped 3 gallons from 6B-S-LYS and 6 gallons from 6B-N-LYS. This Order continues to require the Discharger to continue sampling and to remove any liquid above the invert pipe elevation for corresponding manhole.

65. The EMP for WMU 6C included additional sampling of suction lysimeter 6C-S-LYS. This sampling confirmed the presence of four VOCs at low levels and elevated levels of nine inorganic constituents. The analyses indicate that concentrations of inorganic constituents in the samples were higher than in leachate samples from the 6C sumps, and that there were two VOCs in the samples that were not present in the leachate. The Discharger concluded that the source of the liquid in the lysimeters was construction water being squeezed from the clay layer. However, as a corrective action measure, the Discharger proposed to install additional landfill gas (LFG) extraction wells in WMU 6C. The system was installed in 2005 and is currently operating. Lysimeter 6C-S-LYS was moved from Detection Monitoring to Corrective Action Monitoring in 2004.

66. The EMP for WMU G (a Class II surface impoundment) included some additional monitoring of suction lysimeter G-LYS-1, as well as an analysis of historical data from the lysimeter and the overlying leak detection sump, and data from nearby WMUs. The analyses confirm the presence of six VOCs in G-LYS-1; however, none of these VOCs were detected in the leak detection sump above the lysimeter. The Discharger therefore concluded that the source of the VOCs is not from the liquid in the surface impoundment. The Discharger also concluded that the source of the contamination in the suction lysimeter may be from residual contamination left in the underlying native soils following the removal of the former clay only liner system for this surface impoundment. The Discharger shall continue monitoring the G-LYS-1 lysimeter and WMU G shall remain in a Corrective Action Monitoring Program as specified in MRP R5-2016-0094.

67. The EMP for the bioreactor pilot cell demonstration unit inside of WMU 6B included additional sampling of pan lysimeter CEC-LYS. The monitoring confirmed the presence of 20 VOCs in the lysimeter, and 15 of these were confirmed to be present in the overlying sump. The Discharger concluded that the liquid in the CEC-LYS is indeed leachate from the pilot cell unit. However, the Discharger stated that CEC-LYS was inappropriately labeled since it is really part of the primary liner system and acts as a secondary containment unit for the pilot cells. Unsaturated zone monitoring for WMU 6B in which the pilot cells are constructed is conducted at pan lysimeters beneath the 6B sumps. The Discharger proposed that the CEC-LYS be renamed CEC-SC for "secondary containment". Since unsaturated zone monitoring for all of WMU 6B is conducted at 6B-S-LYS and 6B-N-LYS, and since the CEC-LYS is part of the primary containment system for WMU 6B, CEC-LYS was renamed to "CEC-SC" as requested by the Discharger. This Order also continues to require any liquid in secondary containment sumps to be measured, recorded, and removed.

68. The LFG control system includes a gas flaring facility, a landfill gas-to-energy plant, and vertical and horizontal extraction wells as shown in Attachment G. The LFG control system is part of the corrective action program at the landfill to prevent VOCs present in LFG from impacting groundwater. Landfill gas migration is monitored by perimeter landfill gas probes 1 to 7, shown on Attachment E. Landfill gas probes 9 to 12 are proposed to be installed in 2016.

LINER PERFORMANCE DEMONSTRATION

69. 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."

    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."

70. The Discharger submitted a liner performance demonstration as an Engineered Alternative Design (EAD) for WMU 6D, Phase 2 and future modules with the same liner system. This EAD demonstrates that the system will comply with the applicable Title 27 performance standards by combining a Subtitle D composite liner with additional containment components in critical hydraulic areas (i.e. sumps and trenches) and a secondary layer that provides both containment and leak detection under the entire unit.

71. The Discharger demonstrated the adequacy of the proposed liner system by calculating the system efficiency for inhibiting leaks; the potential leakage rates; and by estimating the potential impacts on groundwater. The Discharger calculated the system efficiency between 99.999912% and 100% based on the permeability of the sub-grade soils; the effects of the leak location survey; and by using a weighted average approach of leachate contact on various portions of the liner. Using the system efficiency and average leachate generation rates at various stages of landfill development, the leakage potential was estimated to be 0.0001 gallons per acre per day (gpad). The Discharger then estimated the chemical constituent levels that may occur in groundwater by relating the leakage potential (0.0001 gpad) to an estimated affected volume of groundwater and then calculating predicted constituent levels due to dispersion and dilution. The volume of impacted groundwater is calculated based on estimated groundwater velocities and gradients beneath WMU 6D, and by conservatively considering a limited "plume" width of 10 feet and a depth of 10 feet at the point of compliance with no attenuation. The highest measured concentrations of VOCs, metals, and general chemical parameters in leachate were used. Based on the calculations, the Discharger concluded that there would be no measurable groundwater impairment.

72. Based on the liner performance demonstration described in the findings above, this Order requires future modules for WMU 6 & 7 to be constructed with the EAD composite liner system approved for WMU 6D, Phase 2, following Regional Water Board staff approval of a Final Design Report for each module that includes engineered design plans and a construction quality assurance (CQA) plan.

CONSTRUCTION AND ENGINEERED ALTERNATIVE

73. On 17 June 1993, the State Water Board adopted Resolution 93-62 implementing a State Policy for the construction, monitoring, and operation of municipal solid waste landfills that is consistent with the federal municipal solid waste regulations promulgated under 40 Code of Federal Regulations section 258 (aka, 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.

74. Title 27, section 20080(b) allows the Central Valley Water Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in accordance with Title 27, sections 20080(c)(1) 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(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(b)(2).

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

Landfill WMUs

76. 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.

77. On 17 February 2016, the Discharger submitted an amended Report of Waste Discharge requesting approval of a prescriptive standard for liner design Module 6E and all future landfill modules at the facility. The liner system proposed by the Discharger for the future landfill modules consists of, from top to bottom:

- One foot soil operations layer, or three feet of shredded tires, or two feet of 6-inch minus ground wood following written Executive Officer approval
- Geotextile filter
- LCRS – 1 foot thick layer gravel
- 60-mil HDPE geomembrane liner
- Two feet of compacted clay with a hydraulic conductivity of less than $1x10^{-7}$ cm/sec
- Three feet of compacted earthfill
- 40-mil HDPE geomembrane liner

78. Section 20240 (c) of Title 27 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 the groundwater table. Existing WMUs are to be "operated" to maintain the required separation. WMUs 1, 2, 3, and 4 are “existing units” under Title 27.

79. Groundwater elevation monitoring indicates that during periods of high groundwater there is inadequate separation between groundwater and the landfill units. In siting WMU 5 (in 1988), the Discharger installed a slurry wall and a line of extraction wells along the northwest perimeter of the site to help reduce the water table to maintain the required separation. The trench for the wall was excavated to an elevation of about 15 feet below MSL. The Discharger has since been operating these de-watering wells to maintain a minimum five feet of separation.

80. The Regional Water Board (in previous requirements) approved an Engineered Alternative Design (EAD) for WMU 6A and 6B, which reduced the required amount of

separation to three feet, as measured from groundwater to the base of the 60-mil HDPE primary liner. The engineered alternative design recognized the composite liner design, slurry wall, and de-watering system, as "engineered structures" for the purpose of ensuring that there is adequate separation from wastes and that an upward hydraulic head does not occur on the bottom of the liner. The Discharger agreed to continue de-watering as necessary to meet the operating requirements of Section 20240 (c) of Title 27. The EAD was approved for the remaining WMU 6 modules and the surface impoundments, however, installation of a capillary break or groundwater barrier layer and five feet of separation is required, except below the LCRS trenches and sumps where the minimum separation is three feet for WMU 6 modules and two feet for the surface impoundments. The siting designs for all the WMUs are summarized in Finding 8.

81. The Discharger justified the EAD based on the lack of available onsite soils to build up the landfill to maintain 5-feet of groundwater separation. In approving these engineered alternative designs, the Regional Water Board found that the Discharger made the demonstration required by Section 20080(b) of Title 27, namely that construction of the prescriptive standard is unreasonably or unnecessarily burdensome and will cost substantially more than an EAD. The Discharger demonstrated that the proposed engineered alternative is consistent with the performance goals of the prescriptive standard and affords at least equivalent protection against water quality impairment.

82. As part of the design analysis for the proposed increase in the ultimate height of the future landfill WMUs by 60 feet, the Discharger submitted a March 2012 Geotechnical Evaluation for WMUs 6 and 7. The geotechnical evaluation included a settlement analysis for the ultimate consolidation settlement of the native soil underlying the WMU 6 and 7 expansion area. The ultimate settlement at the center of the expansion area was calculated to be 5.1 feet. The Discharger has stated that the liner grading plan will be designed to ensure the required five-foot separation between groundwater and waste would be maintained after ultimate subgrade settlement. The Discharger is also conducting a groundwater modeling study to determine if expansion of the slurry wall and groundwater extraction system will help maintain the required separation. Based on the model results, the primary liner can be installed at an elevation of 22 feet msl without requiring additional operations and maintenance.

83. This Order requires the Discharger to design the WMU 6 and 7 expansion area to maintain at least five-feet of separation between groundwater and waste by installing a 40-mil geomembrane capillary break five feet below the primary geomembrane to stop capillary rise (as proposed), and to design the liner grading plan to ensure five feet of groundwater separation is maintained after ultimate subgrade settlement without groundwater exerting an upward force on the capillary break layer. The separation between groundwater and waste is reduced to three feet below the LCRS trenches and sumps. This Order allows the use of a slurry wall and groundwater extraction system to maintain the required groundwater separation below the waste. The primary liner may be installed at a minimum depth of 22 feet msl without incurring additional financial

assurances for operations and maintenance. Prior to construction of a new WMU, the Discharger must specify how groundwater separation will be maintained and, if required, a description of the additional financial assurances for Executive Officer approval.

84. The landfill expansion area for WMU 7 is the current location where extracted groundwater is discharged in the dry season after being stored in the groundwater storage basin. Therefore, the Discharger must find another long-term disposal option for extracted groundwater prior to constructing WMU 7 such that the groundwater extraction system can be operated for WMUs 5 and 6 for as long as the waste is a threat to water quality. The long term strategy will require updated Non-15 WDRs and an update to this Order prior to implementation.

85. Leachate systems are designed to collect and remove leachate from each WMU. WMUs 1 through 4 contain vitrified clay pipes installed in perimeter gravel-filled trenches below the base of the unit. Pipes gravity drain to manholes outside the unit and then to leachate pump station 1 (LPS1). WMU 5 is graded in a ridge and swale configuration. Each swale contains a perforated pipe that collects the leachate and drains it to the east to a main collection pipe. The main collection pipe gravity drains to the south to LPS1 where leachate is pumped to WMU G or WMU H. WMUs 6A through 6C contain perforated HDPE collection pipes that gravity drain to a trunk line at the perimeter of the cell and then to LPS2. WMUs 6A through 6C each contain two leachate collection trunk lines that are each designed at a flow rate of 1,750 gallons per day. WMU 6D1 and 6D2 are constructed in a ridge and swale configuration such that they are hydraulically separated. Collected leachate gravity drains to collection ditches and then to the south to one of four leachate sumps where it is then pumped to WMU G or WMU H. WMUs 6D1 and 6D2 each contain two leachate collection trunk lines that are both designed at a flow rate of 3,175 gallons per day. Future modules will drain to the north or south to collection sumps where it will be pumped to WMU G or H.

86. Future cells/modules will be constructed with a 40-mil HDPE liner below the primary liner and the low-permeability layer. The 40-mil HPDE liner acts as a large pan lysimeter below each cell/module for the purpose of unsaturated zone monitoring.

87. Existing unlined landfill units were not constructed with unsaturated zone monitoring devices. The groundwater extraction system artificially lowers the water table in the vicinity of the unlined landfill units; therefore, the extracted groundwater is representative of what's in the vadose zone. Perimeter gas probes monitor the unsaturated zone for WMUs 1 to 3. Additional, unsaturated zone monitoring is not required for the existing unlined landfill units.

88. The June 2004 Final Closure and Post-Closure Maintenance Plan (FCP) for WMUs 1 through 5 and the November 2014 Preliminary Closure/Post-Closure Maintenance Plan for WMUs 6 & 7 includes a stability analysis for WMUs 1 through 7, G, and H pursuant to Title 27, section 21750(f)(5). The Discharger's stability analysis includes components to demonstrate the integrity of the landfill foundation, final slopes, and containment

systems under both static and dynamic conditions during the landfill's closure period and post-closure maintenance period. The stability analysis demonstrates that the structural components of WMUs 6, 7, G, and H will withstand the forces of the Maximum Credible Earthquake (MCE) of 0.33g without failure of the containment systems or environmental controls. This Order requires additional stability analyses included with the designs of future landfill WMUs to show that the landfill WMUs will be stable throughout the life of the landfill.

89. This Order approves the Discharger's proposed liner system for future modules as described in Finding 9 and requires that the Discharger submit design plans and construction quality assurance (CQA) plans for each new module or modules for review and approval at least 90 days prior to construction.

Composting

90. The Discharger is proposing to continue to accept and process food waste on top of an operations pad consisting of an all-weather surface with a 1% grade on top of composite lined landfill units. This Order requires the Discharger to maintain this pad in accordance with the requirements detailed in Construction Specifications D.15 to D.22 for as long as it is used for this activity.

91. The Discharger proposes to expand the compost operation to accept and process food waste and store finished compost at the Wood and Yard Waste Facility. This Order requires these operations to be conducted on a minimum one foot thick operations pad with a permeability of $1x10^{-5}$ cm/sec as detailed in Construction Specification D.14.

92. The Discharger is proposing to construct seven anaerobic compost cells on top of WMU 6D2. Each cell will be approximately half an acre in size with a base composite liner system consisting of the following (top to bottom):

- Gas extraction piping wrapped with shredded tires and geotextile manufactured in a warning color to alert excavation crews of the liner system during compost excavation
- 1-foot thick soil or 6-inch minus ground wood Operations Layer
- LCRS Geocomposite
- 60-mil high density polyethylene (HDPE)
- Leak Detection Geocomposite
- Minimum 12-inch thick foundation layer

This Order approves this base liner system and requires the base liner system to be constructed on stabilized substrate as detailed in Specification D.12. During the anaerobic composting cycle, the anaerobic compost cells will be covered with soil or Executive Officer approved Alternate Intermediate Cover. During the aerobic composting cycle, the cover will be removed.

93. Leachate from the anaerobic compost cells that may leak through defects in the primary liner are captured in the Leak Detection Geocomposite. This Order requires the Discharger to submit an Anaerobic Compost Cell Operation and Maintenance Plan which includes Action Leakage Rates for the base liner system prior to operation of the Anaerobic Compost Cells.

94. Following decomposition of the compost, the cells are excavated and the compost material is screened, allowed to cure, and then marketed. This Order requires the portions of the base liner system within the anaerobic compost cell that are exposed during excavation to be inspected prior to discharge of additional wastes for composting. Excavated compost that is not fully cured will be finished using aerobic composting windrows on top of a composite lined landfill unit or at the Wood and Yard Waste Facility. This Order requires these operations to be conducted on an operations pad meeting the requirements of Construction Specification D.14.

95. This Order requires that the Discharger submit design plans and construction quality assurance (CQA) plans for each new cell or cells for review and approval at least 90 days prior to construction.

LANDFILL BIOREACTOR WMUS

96. Bioreactors are an alternative to the traditional “dry tomb” waste management method in which the natural degradation rate of the waste is intentionally accelerated by the addition of moisture in a controlled manner. Leachate collected in the bioreactor’s LCRS is returned to the waste mass, and other liquid wastes can also be added to achieve optimum moisture for degradation of the organic portion of the waste. Accelerated degradation of the waste also creates additional landfill gas that must be removed and can be used to generate electricity. Accelerated biodegradation also creates additional air space, and reduces the threat of the waste to water quality more quickly than with traditional landfills.

97. On 21 April 2004, USEPA revised 40CFR, Part 258.4 allowing states to issue Research, Development, and Demonstration (RD&D) Permits to provide variance from liquids restrictions at MSW landfills provided that the state obtains USEPA approval under the new rule. In order to implement the new rule in California, the State Water Resources Control Board made revisions to Resolution No. 93-62 Policy for Regulation of Municipal Solid Waste on 21 July 2005, and made revisions to Title 27 CCR (Section 20070) allowing regional water boards to issue RD&D Permits through revision or adoption of waste discharge requirements. USEPA approved California under the new rule on 19 October 2007. This Order provides the requirements for the Discharger to operate bioreactors under the RD&D rule.

98. 40 CFR, Part 258.4 allows states to issue RD&D Permits providing variance from liquids restrictions provided that the landfill unit has an LCRS that is designed and constructed to maintain less than a 30-centimeter (~12-inch) liquid depth on the liner. The permits

may be issued for a period of up to three years at which time dischargers may apply for another three-year period for a total of up to twelve years (four three-year periods). The MSW landfill units must only receive types and quantities of waste the "State Director" (for purposes of this permit, the "State Director" is the Regional Water Board) deems appropriate for the purposes of demonstrating the efficacy and performance capabilities of the technology or process. The RD&D Permits must include requirements necessary for protection of human health and the environment, requirements to provide information necessary to assess the operation of the facility, and require annual reports showing whether and to what extent the site is progressing in attaining project goals. The "State Director" may order an immediate termination of all operations related to variance from liquids restrictions if it is determined that project goals are not being attained, including protection of human health and the environment.

99. Between 1999 and 2001, one aerobic and two anaerobic bioreactor units were constructed in WMU 6D, Phase 1 and have been operated under a waiver from USEPA as a demonstration project. The units were equipped with instrumentation placed at various levels within the bioreactor cells to monitor process conditions, including temperature sensors, moisture sensors, and pressure transducers. The pressure transducers measure hydrostatic head in the LCRS. Multi-port water injection and gas recovery systems were also placed at various levels within the waste. Recovered LFG is routed to the landfill's gas-to-energy plant for generation of electricity. After many years of operation, the Discharger reports that the operation of the modules in WMU 6D, Phase 1 as bioreactors has resulted in a four to seven-fold increase in LFG production, and a corresponding increase in the rate of waste decomposition.

100. Previous WDRs required the bioreactors constructed in WMU 6D, Phase 1 to maintain a liquid depth of less than 4 inches on the liner system, and to cease discharge of liquids to the units if the depth of liquid on the liner exceeded 10 inches. USEPA allows a depth of up to 30 centimeters, or approximately 12 inches. This Order requires bioreactor units, including WMU 6D, Phase 1, to maintain a liquid depth on the liner of less than 6 inches by adjusting liquids addition to the unit to maintain liquid levels below that depth, and to cease discharge of liquids to the unit if the liquid depth on the liner equals or exceeds 12 inches. The allowable depth is increased to 6 inches since the USEPA Rule allows up to 12 inches, but is held at 6 inches as a precaution against violating the rule and since the Discharger has been able to operate their bioreactors in the past with a maximum depth of 4 inches. Monitoring and Reporting Program R5-2016-0094 also requires the Discharger to submit an annual report with all bioreactor data and an assessment as to whether the bioreactors are attaining their project goals.

101. As required for RD&D permits, the variance from liquids restrictions authorized by this Order is effective for up to three years, at which time the RD&D permit would need to be renewed for the exemption from liquids restrictions to continue. Currently, the facility is not utilizing the RD&D permit liquids restrictions variance. The Discharger is required to notify the Water Board when they will enact the RD&D permit liquids restrictions variance. The exemption from liquids restrictions allowed under this RD&D Permit

expires three years after the Discharger begins operating a bioreactor unit. The RD&D Permit may be terminated earlier by the Executive Officer or the Regional Water Board if determined to be a threat to human health or the environment.

102. The bioreactors are instrumented and LFG piping and liquid injection piping is placed as they are filled. Previous bioreactor cells were covered with a geomembrane prior to the start of liquid injection to inhibit the uncontrolled inflow and outflow of liquids and gases from the cell surface. For future bioreactor cells, the Discharger proposes to cover the cells with soil or Alternate Intermediate Cover prior to the start of liquid injection. This Order requires daily inspections for leachate seeps on days that liquids are added and weekly inspections when only leachate is being recirculated. The Order also requires inspections after major storm events.

103. The Discharger proposes to mine bioreactor units for recyclable material and use the decomposed residual undersized material as ADC. The Discharger will mine the aerobic cell within WMU 6D first to determine if mining of bioreactor units is cost effective or if there are other issues that would make mining of bioreactor units undesirable. The Discharger's long-term plan is to fill bioreactors to approximately two-thirds of design capacity, operate them for seven to ten years, fill them to full capacity, operate them for another seven to ten years, refill to full capacity, operate for another seven to ten years, and then either mine them or refill them to full capacity and close them. This Order includes requirements for mining of bioreactor units that do not allow nuisance odors beyond the landfill property boundary, that require the residual non-recyclable material to be stored on an impermeable pad and covered, that only allow mining of bioreactors during the dry season, and that require mined bioreactor units to be prepared for the wet season by 1 November of each year.

104. The Discharger submitted a landfill stability analysis included in Appendix E of the July 2007 Preliminary Closure and Post-Closure Maintenance Plan for WMUs 6 and 7. The updated stability analysis was necessary due to the 60-foot height increase and to account for any changes in the internal shear strength of the waste caused by the addition of liquids. [1] The stability analysis indicated a static factor of safety of 1.5 which is equal to the minimum factor of safety required by Title 27. The stability analysis also included a dynamic analysis for the Maximum Probable Earthquake as required by Title 27. The analysis indicated a displacement of up to 2.6 inches which is less than the 6 to 12 inches of displacement generally considered to be acceptable for landfills.

[1] In response to a question by Regional Water Board staff regarding the assumed internal shear strength of the waste used in the stability analysis, the Discharger's consultant, in a 7 September 2007 correspondence, concluded that the assumed internal shear strength of 33 degrees was suitable for the WMU 6 and 7 bioreactors. This conclusion was based on a 2001 paper by E. Kavazanjian entitled *Mechanical Properties of Municipal Solid Waste* which states that MSW shear strength is largely unaffected by liquid addition or enhanced degradation when viewed on an effective stress basis.

CLOSURE

Closure of Landfill WMUs

105. Title 27, section 21090 provides the minimum prescriptive final cover components for landfills consisting of, from top to bottom, the following layers:

    a. One-foot thick soil erosion resistant/vegetative layer.
    b. Geomembrane layer (this layer is required for composite-lined landfills for equivalency to bottom liner).
    c. One-foot thick soil low flow-hydraulic conductivity layer, less than $1x10^{-6}$ cm/s or equal to the hydraulic conductivity of any bottom liner system.
    d. Two-foot thick soil foundation layer.

106. 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.

Closure of WMUs 1 through 5

107. WMUs 1, 2, 4 and 5 were inactive since 1992, but were never closed and must therefore comply with Subtitle D. Filling of WMU 3 resumed in 2002 to reach final grades and WMU 3 was closed in 2007. WMUs 1 and 2 were closed in 2012 and 2015. WMUs 4 and 5 resumed accepting waste in order to reach final grades for closure and are required to be closed by 15 October 2019 in accordance with the Cease and Desist Order R5-2011-0076 Extension Letter dated 31 July 2013.

108. The Discharger submitted a revised Final Closure and Post-Closure Maintenance Plan (FCP) for WMUs 1 through 5 dated 1 June 2004, which proposed phased closure beginning with WMU 3. Under the plan, intermediate cover will be removed in areas where additional fill is needed, and wastes will then be discharged to reach final grade. There will be no lateral expansions of any of the units. Soil will then be re-applied as intermediate cover and engineered as foundation layer for final cover.

109. In 2007 the Discharger prepared a “Cover Performance Demonstration Project Work Plan of the Alternative Single Geomembrane Cover for Yolo County Central Landfill’s WMUs 6 and 7”. This Work Plan details a demonstration to compare the EAD liner system detailed in Finding 115 with an alternative EAD which omits the GCL. Two approximately 350 square feet test covers were constructed as part of the WMU 3 closure construction project. Monitoring and evaluation of this alternative cover is ongoing. This Order requires the Discharger to submit a final report on this demonstration prior to submitting a Final Closure Plan for WMU 6 and 7.

110. Two final cover design options may be utilized for the top deck and side-slopes of WMUs 4 and 5:

    Option 1 from top to bottom is as follows:

- Erosion-resistant/vegetative cover layer – One foot vegetative cover soil
- Low hydraulic conductivity /barrier layer – One foot of compacted clay ($k \leq 1 \times 10^{-6}$ cm/sec)
- Foundation layer – Two feet of compacted soil or existing intermediate cover.

The proposed design Option 1 is prescriptive under Title 27 but is an EAD to the prescriptive standard of Subtitle D, which requires that the barrier layer be at least 18 inches thick ($k \leq 1 \times 10^{-5}$ cm/sec). The Discharger has demonstrated, however, that the proposed Title 27 design is more stringent than Subtitle D, given that the maximum hydraulic conductivity of the proposed barrier layer will be one-tenth of the maximum allowed under Subtitle D. Further, the vegetative cover layer will be six inches thicker than that required under Subtitle D, providing additional protection from infiltration. As part of the cover design, this Order requires the Discharger to demonstrate that use of a clay-only cover will meet the Title 27 performance standards given the potential for desiccation cracking of the clay layer.

Option 2 from top to bottom is as follows:

- Erosion-resistant/vegetative cover layer – One foot vegetative cover soil
- Geocomposite drainage layer (geonet with geotextile bonded on both sides) - side slope only
- 40-mil linear low-density polyethylene (LLDPE) geomembrane low hydraulic conductivity /barrier layer with surface texturing (asperity height) of at least 20-mils on both sides
- Foundation layer – One foot of prepared existing intermediate cover.

The proposed design is an EAD to the prescriptive standard under Title 27. The Discharger has demonstrated, however, that the proposed EAD is equivalent to the prescriptive. This demonstration is included in the January 2003 *Justification Report for the Proposed Alternative Cover System of Waste Management Units 1-5* (Alternative Cover Justification Report) which is included in Appendix C of the FCP. This report includes a comparative infiltration analysis that indicates the prescriptive cover (Option 1) would allow 45 percent greater infiltration than the EAD cover (Option 2).

111. The above referenced January 2003 Alternative Cover Justification Report also includes a slope stability analysis for the proposed 3:1 side-slopes indicating the cover will be stable under dynamic conditions; a settlement analysis indicating that settlement of the waste after closure will not cause drainage problems; a drainage layer analysis indicating that the geocomposite drainage layer on the side-slopes will provide adequate drainage to prevent excess pore pressure from building up in the overlying soil layer; and describes the installation of horizontal LFG extraction piping during filling to remove LFG and excess moisture from the waste and from beneath the geomembrane layer of the final cover system. Further details on each of these topics can be found in the report.

112. The top deck of WMUs 1 through 5 will be sloped at 5% for adequate drainage. Perimeter slopes will be no greater than 3:1 (horizontal-to-vertical). Since it is anticipated that the side-slopes will span less than 50 feet of vertical from the base of each unit, the closure plan does not include benching.

113. The Discharger performed a slope stability analysis for the proposed final cover. The static factor of safety was greater than 1.5. The pseudo-static analysis calculated a displacement of 9 inches, which is less than 12 inches of displacement generally considered to be acceptable for landfills. The Discharger's static and dynamic stability analysis demonstrates that the side slopes of the final cover will be stable in accordance with the requirements of Title 27.

Closure of WMUs 6 and 7

114. The Discharger submitted a Preliminary Closure and Post-Closure Maintenance Plan (PCPMP) for WMUs 6 and 7 in November 2014. As with WMUs 1 through 5, closures of modules in WMUs 6 and 7 will be implemented in phases as the modules are filled.

115. The Discharger's 2014 *Preliminary Closure and Postclosure Maintenance Plan* includes an analysis of the proposed engineered alternative final cover. The Discharger proposes an engineered alternative final cover consisting of, from top to bottom, the following layers:

- One-foot vegetative layer of soil or other materials capable of supporting vegetation.
- A double-sided drainage geocomposite with a transmissivity value equal to $1x10^{-4}$ m^2/sec.
- A 40-mil linear low density polyethylene liner (LLDPE) with surface texturing (asperity height) of at least 20 mils on both sides.
- A low permeable geosynthetic clay liner (GCL) with a permeability equal or less than $1x10^{-8}$ cm/sec.
- Two-foot soil foundation layer.

The use of geosynthetic clay liner in lieu of compacted clay represents an EAD to the prescriptive standards of Title 27 and of Subtitle D for a low hydraulic conductivity/barrier layer, which require that the permeability of the low conductivity/barrier layer be no greater than that of the base liner (T27, Section 21090(a)(2), Subtitle D, Section 258.60(a)(1)). The proposed geosynthetic cap ensures that the permeability of the cap will be no greater than that of the Subtitle D composite base liner. Pursuant to Section 20080(b) of Title 27, the Discharger has demonstrated that construction of the prescriptive standard is unreasonably or unnecessarily burdensome and will cost substantially more than the proposed EAD. The Discharger has also demonstrated that the proposed EAD is consistent with both the performance goals and the prescriptive standards of Title 27 and affords equivalent protection against water quality impairment.

116. The top deck of WMUs 6 and 7 will be sloped at 5% for adequate drainage. Perimeter slopes will be not greater than 3:1 (horizontal-to-vertical). Designing and constructing 15-foot wide benches will achieve erosion control and access at least every 50 vertical feet, as required under Section 21090 of Title 27. The maximum elevation upon closure of WMUs 6A through 6D will be 81.4 feet MSL (NAVD 88), approximately 60 feet above surrounding (undisturbed) grade. The maximum elevation upon closure of WMUs 6E through 7P will be 141.4 feet MSL, approximately 120 feet above surrounding grade.

117. The Discharger has demonstrated that the engineered alternative final cover meets the performance goals of Title 27 and that it is equivalent to the prescriptive standard.

118. The Discharger performed a slope stability analysis for the proposed final cover for two scenarios with a toe berm of either 10- or 20-feet wide. The static factor of safety was equal to 1.5 for both of the closure configurations. The pseudo-static analysis calculated factors calculated displacements of 2.6 and 1.1 inches, which the engineer deemed acceptable for the landfill cover design at this Site. The Discharger's static and dynamic stability analysis demonstrates that the side slopes of the final cover will be stable in accordance with the requirements of Title 27.

119. WMUs 6 and 7 modules are estimated to close individually between the next 6 to 110 years based on existing waste inflow to the landfill. If waste inflow increases or decreases, the closure schedule will be adjusted accordingly.

120. Pursuant to Title 27, section 21090(e)(1), this Order requires a survey of the final cover following closure activities for later comparison with iso-settlement surveys required to be conducted every five years.

121. This Order approves the proposed final covers and requires that a final closure and post-closure maintenance plan, design documents, and CQA plan be submitted for review and approval at least 90 days prior to actual closure.

Closure of Anaerobic Compost Cells

122. When no longer needed, anaerobic compost cells will be de-commissioned and closed per an Executive Officer approved Closure Plan. One or more cells may remain in operation as others are closed. As part of de-commissioning, compost and waste materials will be removed from the anaerobic compost cells. Any remaining liquids will be either pumped out of the impoundment or allowed to evaporate. Pumped liquids will either be discharged to a remaining impoundment or to tanks for offsite disposal at an authorized facility. Residual sludges/solids will also be removed and discharged to an authorized onsite unit or offsite facility. The containment system components will then be removed and each cell will be filled with waste to eliminate ponding and leachate migration within landfill WMU from the anaerobic compost cells. The containment system components will also be disposed of at an onsite unit or offsite facility.

Closure of Surface Impoundments

123. When no longer needed to retain landfill leachate, surface impoundments will be de-commissioned and clean-closed per Title 27, Section 21400. One or more impoundments may remain in operation as others are closed. As part of de-commissioning, the impoundments will first be cleaned in accordance with an Executive Officer approved Clean Closure Plan. Any remaining liquids will be either pumped out of the impoundment or allowed to evaporate. Pumped liquids will either be discharged to a remaining impoundment or to tanks for offsite disposal at an authorized facility. Residual sludges/solids will also be removed and discharged to an authorized onsite unit or offsite facility. The containment system will then be inspected and removed in accordance with Title 27.

LANDFILL POST-CLOSURE MAINTENANCE

124. The Discharger submitted a 2004 *Final Closure and Post-Closure Maintenance Plan* for closure and post-closure maintenance of WMUs 1 through 5 and a 2014 *Preliminary Closure and Postclosure Maintenance Plan* for closure and post-closure maintenance of WMUs 6, 7, G, and H. The plan includes inspection, maintenance, and monitoring of the landfill during the post-closure maintenance period, and includes a post-closure maintenance cost estimate for the entire facility. Inspection and maintenance will include the condition of the final cover, drainage features, LCRS, groundwater monitoring wells, unsaturated zone monitoring points, access roads, landfill gas system, groundwater corrective action system, and site security. The plan will be implemented for a minimum period of 30 years or until the waste no longer poses a threat to environmental quality, whichever is greater.

125. Once every five years during the post-closure maintenance period, aerial photographic maps of the closed landfill area will be made to identify and evaluate landfill settlement. Iso-settlement maps will be prepared to determine the amount of differential settlement occurring over the previous five years. Pursuant to Title 27, section 21090(e)(2), this Order requires iso-settlement maps to be prepared and submitted every five years.

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

FINANCIAL ASSURANCES

127. 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 2012 update to the *Final Closure and Post Closure Maintenance Plan* includes a cost estimate for landfill closure

of WMUs 1 and 5. The Discharger's 2014 *Preliminary Closure and Post Closure Maintenance Plan* was updated in June 2015 with a revised cost estimate for landfill closure for WMUs 6, 7, G, and H. The lump sum estimate is for the cost to close largest future area needing closure at any one time. The total amount of the closure cost estimate in 2015 dollars is $77.6 million. This Order requires that the Discharger maintain financial assurance with the California Department of Resources Recycling and Recovery (CalRecycle) in at least the amount of the closure cost estimate. As of 2015, the balance of the closure and post-closure maintenance fund was $17 million.

128. Title 27, sections 21840 and 22211 requires a cost estimate for landfill post-closure maintenance. The Discharger's 2012 update to the *Final Closure and Post Closure Maintenance Plan* includes a cost estimate for landfill post-closure maintenance of WMUs 1 and 5. The Discharger's 2014 *Preliminary Closure and Post Closure Maintenance Plan* includes a cost estimate for landfill post-closure maintenance of WMUs 6, 7, G, and H. The amount of the cost estimate for post-closure maintenance in 2015 dollars is $18.7 million. This Order requires that the Discharger maintain financial assurance with CalRecycle in at least the amount of the post-closure maintenance cost estimate adjusted annually for inflation. As of 2015, the balance of the closure and post-closure maintenance fund was $17 million.

129. Title 27, section 22221 requires a cost estimate for corrective action of all known or reasonably foreseeable releases. The Discharger's 2015 cost estimate of $2.1 million for corrective action of all known or reasonably foreseeable releases. This Order requires that the Discharger maintain financial assurance with the CalRecycle in at least the amount of the cost estimate adjusted annually for inflation. As of 2015, the balance of the corrective action fund was $1.0 million.

130. Title 27 section 22100(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(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. The $2.1 million for corrective action costs detailed in Finding 129 above is for the *Water Release Corrective Action Estimate,* which is more than the *Non-Water Release Corrective Action Cost Estimate* of $745,000*.*

131. Title 27, sections 21840 and 22211 requires a cost estimate for landfill post-closure maintenance. New landfill WMUs constructed to a minimum depth less than 22 feet msl will require additional operations and maintenance activities to pump groundwater and maintain groundwater separation below these WMUs. The additional operation and maintenance activities will need to be continued until the waste no longer poses a threat to water quality. If new landfill WMUs are constructed below 22 feet msl, this Order requires that the Discharger maintain financial assurances with CalRecycle in at least the additional amount of post-closure maintenance for the additional operations and maintenance required to maintain groundwater separation for a minimum of 450 years[2] or until the waste within the associated WMUs no longer poses a threat to water quality. Instead of multiplying the annual postclosure maintenance cost by 450, the Discharger may establish a perpetual fund whereby only the interest earned in the fund is utilized to cover postclosure maintenance costs. This Order also requires the post-closure maintenance cost estimate to be adjusted annually for inflation.

CEQA AND OTHER CONSIDERATIONS

132. In October 1992, the Yolo County Board of Supervisors approved a final environmental impact report (EIR) for addressing impacts associated with the then existing landfill and construction of WMUs G, 6 and 7. On 6 June 1999, the Board of Supervisors further approved a negative declaration for the three surface impoundments comprising WMU H, and in June 2000 approved a negative declaration for the full-scale bioreactor project for WMU 6D. Regional Water Board staff has considered these documents, in preparation of these WDRs.

133. The 1992 EIR identified the following potential significant water quality impacts:

    a. Spread of existing groundwater contamination.
    b. Leachate may infiltrate groundwater.
    c. Landfill gas may impact groundwater.
    d. Storm water runoff may contact landfill wastes and increase leachate.
    e. Expansion will displace areas of wetlands.

134. The 1992 EIR evaluated the impacts and found that the implementation of a corrective action plan and compliance with Title 27 and Subtitle D will provide adequate water quality protection and reduce potential impacts to a less-than-significant level. These WDRs include requirements that avoid or substantially lessen any potential significant impacts to water quality.

135. On 29 September 2005, the Yolo County Board of Supervisors approved a final EIR for various changes at the landfill including operating of future landfill modules as bioreactors, increasing the final height of the landfill by 60 feet, landfill mining of waste

[2] 450 years is equivalent to the life prediction for non-exposed, high density polyethylene geomembrane liner at 20 degrees Celsius, per GRI White Paper #6, Geomembrane Lifetime Predictions by Robert M. Koerner, Y. Grace Hsuan and George R. Koerner, original date 7 June 2005, updated 8 February 2011.

management units, construction of a material recovery facility, expansion of salvaging operations, and expansion of LFG management and utilization options. The 2005 EIR also proposed expansion of an existing composting facility at the landfill, however, no composting is currently conducted. Regional Water Board staff has considered these documents in preparation of these WDRs.

136. The 2005 EIR identified the following potential significant water quality impacts that are related to the proposals in the 2007 JTD:

    a. Potential leakage of leachate from the bioreactors to groundwater.

    b. Potential for future mining of bioreactors to remobilize metals and other contaminants from the waste.

    c. Potential for storm water runoff from the landfill or proposed construction activities to degrade receiving waters.

137. The 2005 EIR evaluated the impacts and proposed mitigation measures to reduce the potential impacts to a less-than-significant level. These WDRs include requirements that avoid or substantially lessen any potential significant impacts to water quality. These requirements include, but are not limited to, composite liner systems with additional leak detection layers, separation of waste from groundwater, landfill mining activities being limited to the dry season, stockpiling and storage of mined material on lined pads that are bermed or equipped with an LCRS, covering of mined material during the rainy season, and use of mined material as ADC only on internal landfill areas where runoff does not go to surface water.

138. 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 CCR, Section 15301.

139. This Order implements:

    a. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*;

    b. The prescriptive standards and performance goals of California Code of Regulations, title 27, section 20005 et seq., effective 18 July 1997, and subsequent revisions;

    c. State Water Board Resolution 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993, and revised on 21 July 2005.

    d. The applicable provisions of Title 40 C.F.R. section 258 “Subtitle D” federal regulations as required by State Water Board Resolution 93-62.

140. The *Statement of Policy With Respect to Maintaining High Quality of Waters in California*, SWRCB Order WQ 68-16 (hereinafter "Anti-Degradation Policy") was adopted by the State Water Board in October 1968. Anti-Degradation Policy limits the Board's discretion to authorize the degradation of "high-quality waters." This policy has been incorporated into the Board's Basin Plans. "High-quality waters" are defined as those waters where water quality is more than sufficient to support beneficial uses designated in the Board's Basin Plan. Whether or not a water is a high-quality water is established on a constituent-by-constituent basis, which means that an aquifer can be considered a high-quality water with respect to one constituent, but not for others. (SWRCB Order No. WQ 91-10.)

141. Anti-Degradation Policy applies when an activity discharges to high quality waters and will result in some degradation of such high quality waters. When it applies, the 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 the activity will not result in the degradation of high quality waters, Anti-Degradation Policy does not apply, and the Discharger need only demonstrate that it will use "best efforts" to control the discharge of waste.

142. Anti-Degradation Policy does not apply to the discharge of waste to Yolo County Central Landfill. The requirements of 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 of this Order reflect the Discharger's best efforts to control such wastes.

143. 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."

144. Water Code section 13267(b) provides that: "In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharge or discharging, or who 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.

145. The technical reports required by this Order and the attached "Monitoring and Reporting Program R5-2016-0094" 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

146. 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.

147. 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.

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

149. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date that this Order becomes final, except that if the thirtieth day following the date that this Order becomes final falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

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

or will be provided upon request.

IT IS HEREBY ORDERED, pursuant to California Water Code sections 13263 and 13267, that Order R5-2007-0180 is rescinded except for purposes of enforcement, and that the County of Yolo, Community Services Department, their agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of 'hazardous waste' is prohibited. For the purposes of this Order, the term 'hazardous waste' is as defined in California Code of Regulations, Title 23, section 2510 et seq.

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

3. The discharge of wastes outside of a waste management unit or portions of a waste management unit specifically designed for their containment is prohibited.

4. The disposal of containerized liquids at this facility is prohibited with the exception of containerized food products.

5. The discharge of liquid waste to the Storm Water Ponds, Clean Water Storage Pond and Water Storage Reservoir is prohibited.

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

7. The disposal of wastes containing greater than one percent (>1%) friable asbestos is prohibited.

8. The discharge of non-friable asbestos to unlined units or bioreactor units is prohibited.

9. The discharge of treated wood waste, except to covered bins for transfer to a landfill that accepts treated wood waste, is prohibited.

10. Projects that generate or have the potential to generate leachate that could impact groundwater and/or surface water quality or interfere with a WMU liner, intermediate or final cover system are prohibited without written Executive Officer approval.

11. The Discharger shall comply with all Standard Prohibitions listed in Section C of the Standard Provisions and Reporting Requirements (SPRRs) dated December 2015 which are attached hereto and made part of this Order by reference.

Landfill WMUs

12. The discharge of 'designated waste' to any landfill unit is prohibited. For the purposes of this Order, the term 'designated waste' is as defined in Title 27.

Composting

13. The discharge of 'designated waste' to any anaerobic compost cell is prohibited. For the purposes of this Order, the term 'designated waste' is as defined in Title 27.

14. The Discharger is prohibited from using the Wood and Yard Waste Facility for receiving or processing composting materials, or storing feedstocks, additives, amendments, or compost (active, curing, or final product) until an acceptable working surface has been constructed as detailed in Construction Specification D.14 and approval is granted from Water Board staff to use the area for compost operations.

15. Aerated windrow and static pile composting not associated with the anaerobic compost cells is prohibited unless coverage is obtained under the CGO.

16. The Discharger is prohibited from collecting and processing containerized food waste de-packaging unit and dewatering sludge with a filter press at the liquids processing area until the Discharger shows that the Operations Pad meets the requirements of Construction Specification D.14 and approval is granted from Water Board staff to use the area for these operations.

Surface Impoundments

17. Except for semi-solid wastes and solids that settle from the impounded liquid, the discharge of solid wastes to any surface impoundment is prohibited.

18. Class II Surface Impoundment liquid classified as designated waste is prohibited to be used as dust control, discharged to an anaerobic compost cell, or discharged into a bioreactor landfill unit under the RD&D Permit.

B. DISCHARGE SPECIFICATIONS

1. Prior to the discharge of waste to a waste management module, all wells within 500 feet of the module shall have sanitary seals which meet the requirements of the Yolo County Health Department or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Regional Water Board and to the State Department of Water Resources.

2. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order. If the Discharger is unable to remove and relocate the waste, the Discharger shall submit a report to the Central Valley Water Board explaining how the discharge occurred, why the waste cannot be removed, and any updates to the waste acceptance program necessary to prevent re-occurrence. If the waste is a hazardous waste, the Discharger shall immediately notify the Department of Toxic Substances Control.

3. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the landfill property.

4. The Discharger shall comply with all Standard Discharge Specifications listed in Section D of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

Landfill WMUs

5. Nonhazardous solid wastes shall be discharged either:

   a. To an existing unlined WMUs 4 and 5 (*existing MSWLF unit* as defined in 40 CFR 258.2) to bring it up to final grade for closure; or

   b. To a Unit (WMUs 6 and 7) equipped with a composite liner containment system which meets the requirements for both liners and leachate collection and removal systems specified under Section D Construction Specifications.

6. Wastes discharged to the landfill WMUs shall only include:

WASTE ACCEPTANCE BY LANDFILL UNITS			
Title 27 Waste Type	**WMU 4 & 5**	**WMU 6 & 7 Non-Bioreactors**	**WMU 6 & 7 Bioreactors**
Inert	Yes	Yes	Yes
MSW	Yes	Yes	Yes
Nonhazardous Solid Waste	Yes	Yes	Yes
Grit and Screenings	No	Yes	Yes
Dewatered Sludge	No	Yes	Yes
Non-Friable Asbestos containing wastes	Yes	Yes	No
Leachate and LFG Condensate	No	Recirculation[1]	Recirculation[1]
Additional Liquids[2]	No	No	Yes

1. Leachate and landfill gas condensate recirculation may occur in compositely lined modules following written approval by the Central Valley Water Board staff.
2. Bioreactor supplemental liquid additions shall be limited to the following: non-hazardous liquids from the surface impoundments, extracted groundwater, treated and disinfected municipal wastewater, and food processing liquid waste.

7. The use of non-hazardous liquid from the surface impoundments for dust control is restricted to Class III landfill units with a composite liner system and LCRS (i.e. WMU 6 and WMU 7) with the following conditions:

   a. It is applied only between 15 April and 15 October each year.

b. It is applied only at rates necessary for dust control and shall not result in migration of leachate through landfilled waste.
c. It is applied using a water truck or equipment that is dedicated only for dust control on the Class III Landfill Units. Water trucks and equipment applying leachate may not be used for dust control outside of the lined Class III Landfill Unit unless they are properly cleaned prior to such use.

8. RD&D Permits provide variance from liquids restrictions at MSW landfills. Liquids discharged to a bioreactor cell shall be limited to leachate and supplemental liquids necessary to reach and/or maintain bioreactor wastes at optimum moisture content without exceeding the waste's moisture holding capacity. Supplemental liquid additions shall be limited to the following:

   a. Non-hazardous liquids from the surface impoundments,
   b. Landfill gas condensate,
   c. Extracted groundwater,
   d. Treated and disinfected municipal wastewater; and,
   e. Food processing liquid waste.

9. As required for RD&D permits, the variance from liquids restrictions authorized by this Order is effective for up to three years, at which time the RD&D permit would need to be renewed for the exemption from liquids restrictions to continue. Currently, the Discharger is not discharging additional liquids into bioreactor landfills; therefore, the exemption from liquids restrictions allowed under this RD&D Permit expires three years after the Discharger begins discharging additional liquids into the bioreactor. This Order requires the Discharger to submit a report 90 days prior to discharge of additional liquids into a bioreactor under the RD&D Permit for written Executive Officer approval, detailing the liquid injection method, associated monitoring, and proposed date of liquids injection. The RD&D Permit may be terminated earlier by the Executive Officer or the Regional Water Board if there is a threat to human health or the environment.

10. The RD&D permits may be issued for a period of up to three years at which time dischargers may apply for another three-year period for a total of up to twelve years (four three-year periods). Currently, the Discharger has used three years of the twelve and can utilize the RD&D permit liquids variance for nine more years.

11. The Discharger may not use any material as alternative daily cover (ADC) that is not listed below as approved ADC unless and until the Discharger has demonstrates that it meets the requirements in Title 27, section 20705, and the Discharger has received approval that it may begin using the material as ADC. Approved Alternative Daily Cover materials include:

    a. Screened green waste.
    b. Compost

c. Residual under-sized fraction material from mining of bioreactor units (for use on internal landfill areas only such that stormwater runoff cannot travel outside of the landfill unit).
d. Geosynthetic blankets (Tarps)
e. Sludge or sludge derived materials
f. Processed construction and demolition waste (C&D Waste).
g. Spray applied product.

12. The Discharger may use an Alternate Intermediate Cover following written Executive Officer approval of a demonstration showing that the Alternate Intermediate Cover meets the requirements of Title 27, Section 20700 and 20705.

13. The Discharger shall use approved ADC and Alternate Intermediate Cover 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 or Alternate Intermediate Cover is not a threat to surface water quality and the demonstration has been approved. This demonstration may take removal of sediment or suspended solids into account for landfills where surface water drains to a sedimentation basin.

14. When the landfill units are not being operated under the RD&D permit liquids variance, leachate and/or landfill gas condensate may be returned only to Modules 6A through 6D and future composite lined modules listed in Finding 9 of this Order in accordance with Standard Discharge Specifications D.2 through D.4 of the SPRRs.

Composting

15. Wastes processed at the food waste receiving and processing area shall be limited to the following materials as defined in the CGO:

a. Food material,
b. Agricultural material,
c. Green material; and,
d. Vegetative food material.

16. Wastes discharged to the anaerobic compost cells shall be limited to leachate derived from an anaerobic compost cell, non-hazardous liquids and solids from the covered liquid digester WMU H2 and the following materials as defined in the CGO:

a. Food material
b. Agricultural material,
c. Green material,
d. Vegetative food material,
e. Liquid food material,
f. Manure; and,
g. Waste water sludge.

17. Biosolids (as defined in the CGO) that are used as a feedstock (as defined in the CGO) in the compost shall comply, at a minimum with the ceiling concentrations listed in Table 1 of 40 Code of Federal Regulations part 503 and listed in the Table below, and Class B pathogen requirements. The United States Environmental Protection Agency (USEPA) regularly reviews, and may revise, the limitations and requirements of 40 Code of Federal Regulations part 503. 40 Code of Federal Regulations part 503 should be consulted for updates. If the 40 Code of Federal Regulations part 503 is updated, the most current 40 Code of Federal Regulations part 503 ceiling concentrations shall apply to this Order.

Biosolids Feedstock Ceiling Concentrations		
Constituent	**Units**	**Ceiling**
Arsenic	mg/kg	75
Cadmium	mg/kg	85
Copper	mg/kg	4,300
Lead	mg/kg	840
Mercury	mg/kg	57
Molybdenum	mg/kg	75
Nickel	mg/kg	420
Selenium	mg/kg	100
Zinc	mg/kg	7,500

Surface Impoundments

18. Liquids discharged to the Class II surface impoundments (WMUs G & H) shall be limited to the following:

    a. Landfill leachate.
    b. Landfill gas condensate.
    c. Cooling water from the landfill gas-to-energy plant.
    d. Liquids from the surface impoundment's LCRS.
    e. Septic wastes.
    f. Chemical toilet waste.
    g. Water treatment lime sludge.
    h. Liquid food material, as defined in the CGO.
    i. Waste water sludge and/or manure to provide the necessary microorganisms to begin the anaerobic decomposition when starting the WMU H2 liquid digester.
    j. Other non-hazardous liquid wastes that do not cause violations of this Order such as nuisance conditions, reaction products, capacity problems, or impairment of liner integrity.

19. Liquids within the Class II Surface Impoundments shall be tested to confirm the liquids are non-hazardous and non-designated prior to use as dust control, discharged to an anaerobic compost cell, or discharged into a bioreactor landfill unit under the RD&D permit. Class II Surface Impoundment liquid classified as designated waste shall be disposed of at an appropriate offsite disposal facility or

remain within the Class II Surface Impoundment for further treatment. Class II surface impoundment liquid classified as hazardous waste shall be immediately removed and disposed of at an appropriate offsite disposal facility.

C. FACILITY SPECIFICATIONS

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

2. The Discharger shall comply with all Standard Facility Specifications listed in Section E of the SPRRs dated December 2015 which are part of this Order.

Landfill WMUs

3. With the following exceptions, a minimum separation of 5 feet shall be maintained between wastes (or leachate) and the highest anticipated elevation of underlying groundwater, including the capillary fringe:

   a. A minimum of three feet of separation shall be maintained between the primary liner and high groundwater, including the capillary fringe, at WMU 6A and 6B.

   b. A minimum of three feet of separation shall be maintained between the primary liner and installed capillary break at the LCRS trenches and sumps for WMU 6C and 6D.

   c. A minimum of three feet of separation shall be maintained between the primary liner and installed capillary break at the LCRS trenches and sumps for future modules to be constructed in WMU 6 and 7.

4. The Discharger shall operate the groundwater extraction and treatment system as necessary to maintain required separation between groundwater and waste for as long as the waste in WMUs is a threat to water quality.

5. In addition to sampling required by MRP R5-2016-0094, any liquids or leachate detection in a pan lysimeter or a secondary containment sump shall be removed from the lysimeter/sump (or corresponding manhole) such that liquid does not back-up into the lysimeter or sump and shall be handled/disposed of as leachate. The Discharger shall measure, record and tabulate the elevation of the liquid and the amount of liquid removed from each lysimeter, sump or manhole.

6. The Discharger shall provide engineered structures or drainage systems to insure upward hydraulic head due to high groundwater does not occur on any new WMU liner. Where a synthetic liner is used for a capillary break, it shall be installed in the upper portion of the capillary fringe to minimize the potential for upward hydraulic head on the capillary break. The construction of new WMUs shall include a monitoring network to determine groundwater elevations and whether high groundwater causes upward hydraulic head on any new WMU liner or capillary

break. If the Discharger or Regional Water Board determines through analyses of monitoring data that upward hydraulic head has occurred on the liner or capillary break, the Discharger shall submit a revised Report of Waste Discharge within 180 days which specifies the method by which upward hydraulic head on the liner due to high groundwater will be prevented and a time schedule for remedial action.

7. All landfill modules shall be equipped with horizontal landfill gas extraction wells during filling as described in the Final Closure Plan for WMUs 1 through 5 and the Preliminary Closure and Postclosure Maintenance Plan for WMUs 6, 7, G, and H. Landfill gas shall be extracted from each new and existing extraction well at rates to prevent migration of landfill gas outside of the units and to prevent landfill fires.

Landfill Bioreactor Units

8. The Discharger shall submit a revised Bioreactor O&M Plan for review and approval at least 60 days prior to any proposed changes to the operations and/or maintenance of the bioreactors. The Bioreactor O&M Plan should outline strategies and methods for leachate re-circulation, supplemental liquid injection, preventing wastes from exceeding their moisture holding capacity, and monitoring leachate seeps and describe how the changes will maintain compliance with this Order and Title 27.

9. Bioreactor units shall be covered with a geomembrane or a bio cover prior to the start of liquid injection. Bioreactor units shall be inspected for leachate seeps daily when liquids are added, and weekly when only leachate is being recirculated. Bioreactors shall also be inspected for leachate seeps after any major storm event.

10. The hydraulic head on the liners for the bioreactor units shall not exceed six inches. If LCRS monitoring indicates that the hydraulic head on the liner exceeds this value, the Discharger shall immediately:

    a. Notify the Regional Water Board,

    b. Adjust the liquid injection rate,

    c. Check the sump pumps for proper operation, and

    d. Implement other appropriate measures to reduce the head, as set forth in the Bioreactor O&M Plan.

    If the hydraulic head on any bioreactor unit liner equals or exceeds 12 inches, the Discharger shall immediately:

    a. Notify the Regional Water Board,

    b. Cease the discharge of liquids to the unit, and

c. Implement any other necessary corrective measures to reduce the head to six inches or less.

11. Mining of bioreactor units shall only be conducted between **15 May** and **15 October**. Mining of bioreactor units shall not be conducted during precipitation events, or when precipitation is predicted to occur.

12. Mining of bioreactor units or stockpiling of mined material shall not cause objectionable odors beyond the landfill property boundary.

13. Mining of bioreactors shall not be conducted within five feet of the underlying operations layer.

14. Stockpiling of the mined residual under-sized fraction material shall only be conducted on a minimum one foot thick pad with a hydraulic conductivity of 1.0×10^{-5} cm/s or less or a portion of a composite lined module that is bermed to prevent runoff of leachate or contact stormwater and that cannot be damaged by equipment. Pads constructed of concrete shall be steel-reinforced and shall be treated with a surface sealant to prevent leakage.

15. Stockpiled mined residual under-sized fraction material shall be covered during the wet season from **1 November** to **30 April** and during any precipitation events that occur during the dry season to prevent contact of the material with rainwater.

16. By **1 November**, bioreactor units that have been mined shall be prepared for the wet season including, but not limited to, placement of cover over exposed waste.

Composting

17. A minimum of ten feet of separation shall be maintained between the anaerobic compost cells primary liner system and the underlying landfill WMU operations layer.

18. Anaerobic compost cells shall be covered with a geomembrane, soil, or Alternate Intermediate Cover prior to the start of liquid injection. Anaerobic compost cells shall be inspected for leachate seeps daily when liquids are added, and weekly when only leachate is being recirculated. Anaerobic compost cells shall also be inspected for leachate seeps after any major storm event.

19. The action leakage rate (ALR) identified in the Anaerobic Compost Cells Operation and Maintenance Plan shall not be exceeded. If LCRS monitoring indicates that the leakage rate through the primary liner exceeds seventy-five percent of this value, the Discharger shall immediately adjust the liquid injection rate, check the sump pumps for proper operation, and implement other appropriate measures to reduce the leakage. If the hydraulic head on any anaerobic compost cell liner equals or exceeds the ALR, the Discharger shall:

a. **Immediately** notify the Central Valley Water Board staff by telephone and email,
b. **Immediately** cease the discharge of liquids and wastes to the unit,
c. Submit written notification within **seven days** that includes a time schedule to locate and repair leak(s) in the liner system.
d. 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 anaerobic compost cell or other action necessary to reduce leachate production.
e. Complete repairs or liner replacement in accordance with the approved time schedule under "c" and/or "d", above.

20. Excavation, transporting, curing and stockpiling of composted materials from the anaerobic compost cells shall not cause objectionable odors beyond the landfill property boundary.

21. Excavation of the anaerobic compost cells shall not damage the underlying composite liner system. Care shall be taken during excavation of the composted materials to prevent damage to the anaerobic compost cell liner as well as the liquid/gas collection/distribution systems.

22. Following excavation, and prior to adding additional feedstocks, the integrity of the exposed composite liner system shall be inspected and any damages discovered shall be repaired. Additionally, the integrity of the wood waste used as an Operations Layer shall be evaluated. If the wood waste no longer allows leachate to migrate through the Operations Layer, it shall be removed and replaced with a suitable material.

Surface Impoundments

23. The Class II surface impoundment shall have capacity for wastewater flows to the impoundment, precipitation from a 100-year wet season of 31.1 inches distributed at least monthly, a 1,000-year 24-hour storm event (design storm) of 7.2 inches, and shall maintain at least two (2.0) feet of freeboard at all times. Class II surface impoundments and related containment structures shall be operated and maintained to prevent, to the greatest extent possible, inundation, erosion, slope failure, washout, and overtopping under 1,000-year, 24-hour precipitation conditions, and shall be designed to contain the 100-year wet season precipitation without using the required two feet of freeboard.

24. 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 2.0 feet.

25. 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.

26. Any direct-line discharge to a surface impoundment shall have fail-safe equipment or operating procedures to prevent overfilling.

27. 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.

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

29. The **Action Leakage Rates** (ALRs) for the Class II surface impoundments are listed in the table below:

	Action Leakage Rate	
Surface Impoundment	**Gallons per Day**	**Gallons per Month**
H1	17,125	513,750
H2	17,125	513,750
H3	47,648	1,429,440
G	66,463	1,993,890

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.

30. If leachate is detected in the lysimeter of a Class II surface impoundment indicating a leak in the containment structures, the Discharger shall:

a. **Immediately** notify Central Valley Water Board staff by telephone and email that the containment structures have failed.
b. **Immediately** sample and test the liquid in accordance with the unsaturated zone monitoring requirements in MRP R5-2016-0094.

c. Submit written notification of the release to Central Valley Water Board staff within **seven days** including a time schedule to repair the containment structures.
d. Complete repairs of the containment structures in accordance with the approved time schedule.

31. 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. Non-hazardous solids may be disposed of on-site. Solids meeting the definition of Dewatered Sludge may be disposed on-site in accordance with the requirements of Section 20220(c). Solids classified as designated waste must be disposed of at an authorized facility.

32. A minimum of five feet of separation shall be maintained between the secondary liner and installed capillary break or groundwater barrier layer at all surface impoundments, except under the LCRS trenches and sumps where the minimum separation is two feet.

33. As a means of discerning compliance with Discharge Specification B.3, the dissolved oxygen content in the upper zone (one foot) of the Class II surface impoundments shall not be less than 1.0 mg/L.

34. The Discharger shall submit a revised Surface Impoundment O&M Plan to the Regional Water Board if any changes to the operations and/or maintenance of the surface impoundments are proposed to occur. The Surface Impoundment O&M Plan shall outline strategies and methods for evaporating leachate, minimizing vectors and odors, managing pond levels, conducting liner inspections, cleaning the ponds and other relevant information and describe how the changes will maintain compliance with this Order and Title 27. The plan shall include calculations as to the amount of leachate expected to be generated in and pumped from the LCRS back into the impoundment under normal operations in the absence of a liner failure. The plan shall identify the failure criteria of the upper liner and include a response plan in the event of an upper liner failure.

D. CONSTRUCTION SPECIFICATIONS

1. Materials used to construct LCRSs shall have appropriate physical and chemical properties to ensure the required transmission of leachate over the life of the WMUs and the post-closure maintenance period.

2. Leachate generation by a landfill unit or surface impoundment shall not exceed 85% of the design capacity of the sump pump. If leachate generation exceeds this value or if the depth of fluid in an LCRS exceeds the minimum needed for efficient pump operations, then the Discharger shall immediately cease the discharge of sludges, leachate, and other high-moisture wastes to the landfill unit and shall notify the Regional Water Board in writing within seven days. Notification shall include a timetable for corrective action necessary to reduce leachate production.

3. The Discharger may propose changes to the liner 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 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.

4. WMUs shall be designed, constructed, and operated to prevent inundation or washout due to flooding events with a 100-year return period. This Order requires the Discharger to determine the flood elevation for a flood with a 100-year return period and demonstrate that WMUs are designed, constructed, and operated to prevent inundation or washout from this flood event by **15 October 2019**.

5. The Discharger shall comply with all Standard Construction Specifications listed in Section F of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

6. The Discharger shall comply with all Storm Water Provisions listed in Section L of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

Landfill WMUs

7. The Discharger shall construct a composite liner system with an underlying leak detection layer and capillary break layer for WMUs 6E through 6H and 7I through 7P Class III landfill units as described in Finding 9 of this Order in accordance with the following approved engineered alternative liner design (top to bottom):

    a. Operations layer – A minimum one-foot thick soil with hydraulic conductivity of 1×10^{-4} cm/sec or greater[3] or three feet of shredded tires

[3] As an alternative, the Discharger may use a sufficient number of gravel drainage windows within the operations layer properly placed to achieve the minimum hydraulic conductivity requirement to allow leachate to percolate through the operations layer. Other materials (i.e. ground wood) may be used as the operations layer following written Executive Officer approval of a demonstration that the material will protect the liner system and meets the minimum hydraulic conductivity for the life of the landfill and through the post closure period.

b. Geotextile filter layer
c. LCRS - One foot of gravel (or other material that will provide adequate drainage without damage to the geomembrane)
d. Geotextile cushion layer (if puncture calculations indicate one is needed)
e. Geomembrane - 60-mil HDPE geomembrane
f. Compacted clay liner - Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec)
g. Groundwater separation layer- Three feet of compacted earthfill
h. Leak detection layer - Geocomposite drainage layer
i. Capillary break layer - 40-mil HDPE geomembrane liner

8. The Discharger shall not proceed with liner construction (other than earth moving and grading in preparation for liner construction) until the construction plans, specifications, and all applicable construction quality assurance plans have been approved. The required Final Design Report shall include:

   a. Calculations for geomembrane puncture by the overlying LCRS layer and to propose a geotextile cushion of appropriate thickness, if needed.
   b. Ultimate settlement calculations of the underlying native clay with regard to maintaining separation of waste from groundwater, integrity of the liner system, and integrity of the LCRS piping including the riser pipes at the sump.
   c. Stability analyses pursuant to Title 27, section 21750(f)(5) to demonstrate the integrity of the landfill foundation, final slopes, and containment systems under both static and dynamic conditions throughout the landfill's life and closure period and post-closure maintenance period.

9. WMUs 6 and 7 shall be equipped with in-fill landfill gas extraction systems and landfill gas shall also be removed from the primary LCRS when methane is present at levels of 30 percent or greater and landfill gas extraction does not cause landfill fires.

10. The Discharger shall design the liner grading plan for WMUs 6E through 6H and 7I through 7P to ensure five feet of groundwater separation is maintained between the primary geomembrane and the capillary break layer, except that groundwater separation shall be reduced to three feet below the LCRS trenches and sumps. This shall be completed after ultimate subgrade settlement without groundwater exerting an upward force on the capillary break layer. The use of a slurry wall and a groundwater extraction system may be utilized to maintain groundwater separation following Executive Officer approval of the Design Report.

11. Additional operations and maintenance financial assurances are required for landfill WMUs constructed with a minimum depth less than 22 feet msl in accordance with Financial Assurance Specification F.4. The proposed operations and maintenance financial assurance cost estimates and mechanism shall be included with the landfill WMU design report for Executive Officer approval.

Composting

Compost Cells

12. The Discharger shall construct a base composite liner system with an underlying leak detection layer for each anaerobic compost cell with the following approved liner design (top to bottom):

    a. Gas extraction piping wrapped with shredded tires and geotextile manufactured in a warning color to alert excavation crews of the liner system during compost excavation
    b. 1-foot thick soil or 6-inch minus ground wood Operations Layer
    c. LCRS Geocomposite
    d. 60-mil high density polyethylene (HDPE)
    e. Leak Detection Geocomposite
    f. Minimum 12-inch thick foundation layer
    g. Stabilized substrate. Substrate may be stabilized by natural or mechanical compaction to minimize differential settlement, ponding, soil, liquefaction, or failure of pads or structural foundations.

13. During the anaerobic compost cycle, the anaerobic compost cells will be covered with soil or Executive Officer approved Alternate Intermediate Cover. During the aerobic composting cycle, the cover will be removed.

Compost Operations Pad (Receiving, Processing, or Storing)

14. Areas on top of a lined landfill WMU used for receiving or processing composting materials, or storing feedstocks, additives, amendments, or compost (active, curing, or final product), shall meet the requirements of Construction Specifications D.15 through D.22. All other areas used for receiving or processing composting materials, or storing feedstocks, additives, amendments, or compost (active or curing), shall meet the requirements of Construction Specifications D.16 through D.24. The Discharger shall submit design plans and construction quality assurance (CQA) plans for the composting area upgrades for review and approval at least 90 days prior to construction. Alternately, the Discharger may submit a demonstration, certified by a California registered Civil Engineer or Engineering Geologist that the existing working surface at the Wood and Yard Waste Facility meets the Construction Specifications requirements for review and approval at least 90 days prior to use.

15. Areas used for receiving or processing composting materials, or storing feedstocks, additives, amendments, or compost (active, curing, or final product) on top of a lined landfill unit, shall be constructed on stabilized substrate. Substrate may be stabilized by natural or mechanical compaction to minimize differential settlement, ponding, soil, liquefaction, or failure of pads or structural foundations.

16. Areas used for receiving, processing, composting (active, curing, or final product), or storing feedstocks, additives, amendments must be designed to minimize groundwater quality degradation and protect beneficial uses of waters of the state. Working surfaces and containment structures must be designed, constructed, operated and maintained to:

    a. Facilitate drainage and minimize ponding by sloping or crowning pads to reduce infiltration of liquids;

    b. Reliably transmit free liquid present during storage, treatment, and processing of materials to a containment structure to minimize the potential for waste constituents to enter groundwater or surface water; and

    c. Prevent conditions that could contribute to, cause, or threaten to cause a condition of contamination, pollution, or nuisance.

17. Working surfaces must be constructed to allow year round equipment access to feedstocks, additives, amendments, and compost (active, curing, or final product) without damage to the working surfaces and containment structures.

18. To prevent potential impacts to waters of the state, the Discharger must minimize the potential for piles of feedstocks, additives, amendments, or compost (active, curing, or final product) to become over-saturated and generate leachate.

19. Areas used for receiving, processing, or storing feedstocks, additives, amendments, or compost (active, curing, or final product) on top of lined landfill WMUs must be designed, constructed, and maintained to control and manage all run-on, runoff, and precipitation which falls onto or within the boundaries of these areas, from a 100-year, 24-hour peak storm event at a minimum. All other areas must be designed, constructed, and maintained to control and manage all run-on, runoff, and precipitation which falls onto or within the boundaries of these areas, from a 25-year, 24-hour peak storm event at a minimum.

20. Areas used for receiving, processing, or storing feedstocks, additives, amendments, or compost (active, curing, or final product) on top of lined landfill WMUs must be protected from inundation by surface flows associated with a 100-year, 24-hour peak storm event at a minimum. All other areas must be protected from inundation by surface flows associated with a 25-year, 24-hour peak storm event at a minimum.

21. On top of lined landfill WMUs, berms must be designed, constructed, and maintained to prevent run-on and run-off from a 100-year, 24-hour peak storm event at a minimum. In all other areas, berms must be designed, constructed, and maintained to prevent run-on and run-off from a 25-year, 24-hour peak storm event at a minimum. Berms must be adequately protected from erosion, and must not cause, threaten to cause, or contribute to conditions resulting in contamination, pollution, or nuisance.

22. Drainage conveyance systems must be designed, constructed, and maintained for conveyance of wastewater from the working surface in addition to direct precipitation from a 100-year, 24-hour peak storm event when on top of lined WMUs. In all other areas, drainage conveyance systems must be designed, constructed, and maintained for conveyance of wastewater from the working surface in addition to direct precipitation from a 25-year, 24-hour peak storm event at a minimum. Ditches must be properly sloped to minimize ponding and kept free and clear of debris to allow for continuous flow of liquid. Ditches must be adequately protected from erosion, and must not cause, threaten to cause, or contribute to conditions resulting in contamination, pollution, or nuisance.

23. The food waste receiving, processing, and storage area working surfaces must be capable of resisting damage from the movement of equipment and weight of piles, and have a hydraulic conductivity of 1.0×10^{-5} cm/s or less. Working surfaces must consist of one of the following:

    a. Compacted soils, with a minimum thickness of one foot;

    b. Asphaltic concrete or Portland cement concrete; or

    c. An equivalent engineered alternative specified in a Design Report and approved by the Executive Officer.

24. Drainage ditches must be designed, constructed, and maintained to convey all precipitation and runoff from a 25-year, 24-hour peak storm event at a minimum and have a hydraulic conductivity of 1.0×10^{-5} cm/s or less, and be lined with one of the following:

    a. Compacted soils, with a minimum thickness of one foot;

    b. Asphaltic concrete or Portland cement concrete; or

    c. An equivalent engineered alternative specified in a Design Report and approved by the Executive Office.

Surface Impoundments

25. No new Class II surface impoundments are authorized by this Order. If existing surface impoundments reach the end of their service life and need to be reconstructed, the surface impoundments will be constructed in accordance with Construction Specifications D.26 to D.32, but only after written Executive Officer approval.

26. The Discharger shall construct a composite liner system with an underlying leak detection layer for each Class II surface impoundment with the following approved liner design (top to bottom):

    a. A primary 60-mil High Density Polyethylene (HDPE) geomembrane.
    b. A geonet, as a Leachate Collection and Removal System (LCRS).

c. A secondary 40-mil HDPE geomembrane.
d. A two-foot thick compacted soil layer with maximum hydraulic conductivity of $1x10^{-7}$ cm/s.
e. One to three feet earthfill
f. A 40-mil HDPE geomembrane (capillary break and pan lysimeter)

27. 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.

28. The Class II surface impoundment shall have a flow totalizer to measure leachate volumes pumped from the sump in order to track leakage rates.

29. The Class II surface impoundment shall have an unsaturated zone monitoring system consisting of a pan lysimeter beneath the entire sump area of the impoundment.

30. LCRSs shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by each surface impoundment 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 leachate and/or 150% of the Action Leakage Rate flow, whichever is greater.

31. The design capacity of Class II surface impoundments shall accommodate rainfall and leachate produced from a 1,000-year, 24-hour precipitation event, and the 100-year wet season precipitation while maintaining the required two feet of freeboard at all times.

32. The Class II surface impoundment and any overflow basin 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 6-inches.

33. The southern half of WMU G is lined with concrete. If the Discharger wishes to do so, the northern portion of WMU G may be lined with concrete similar to the southern half following written Executive Officer approval of a Design Report that includes engineered design plans and a CQA plan.

34. The depth of WMU G at its shallowest point is approximately 5 feet, which includes 2 feet of freeboard. If the Discharger wishes to do so, the sides of WMU G may be raised by extending the earthfill, compacted clay, secondary geomembrane, blanket LCRS and primary geomembrane following written Executive Officer approval of a Design Report that included engineered design plans and CQA plan. The Design Report shall also include a slope stability analysis showing that the surface impoundment meets the Title 27 stability requirements with the increased height.

35. WMU H-2 may be covered with a geomembrane to create anaerobic conditions for treatment of the liquids within the surface impoundment. Prior to doing so, the Discharger shall submit a design plan for review and approval by the Executive Officer.

E. CLOSURE AND POST-CLOSURE MAINTENANCE SPECIFICATIONS

1. 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 SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

Closure of All Landfill WMUs

2. 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 SPRRs.

3. The Discharger shall close landfill units with a final cover as proposed in the 2004 Final Closure Plan WMUs 1 through 5 and the 2014 Preliminary Closure and Postclosure Maintenance Plan (PCPCMP) for WMUs 6, 7, G, and H and as approved by this Order. The components of the approved final cover as proposed in the PCPCMP are listed in Closure and Post-Closure Maintenance Specification E.14 and E.17.

4. 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, and the modifications are approved by Central Valley Water Board staff.

5. The Discharger shall close the landfill with side slopes at steepness of 3H:1V or less and shall have at least one 15-foot wide bench for every 50 feet of exterior side-slope rise. WMU closure designs for side-slopes shall be supported by a Slope and Foundation Stability Report (SFSR), prepared by a California registered civil engineer or certified engineering geologist per Section 21750(f)(5) of Title 27 and approved by Regional Water Board staff. The SFRS may be included in the FCP and/or the design report for closure of each landfill or landfill module.

6. At closure, landfill final top-deck slopes shall not be less than five percent (5%) and shall be maintained at no less than three percent (3%) grade during the post-closure maintenance period to prevent ponding and infiltration.

7. Select waste shall be placed within the final two feet of the landfill mass to prevent materials from penetrating the interim cover and cover system foundation soil layer.

8. 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.

9. The Discharger shall seal the edges of the final cover by connecting the cover geomembrane to the liner geomembrane, where applicable.

10. The Discharger shall test the critical interfaces of the final cover in a laboratory to ensure minimum design shear strengths are achieved and include the results in the final documentation report.

11. Vegetation shall be planted and maintained over each closed landfill module. Vegetation shall be selected to require a minimum of irrigation and maintenance and for composite final covers, shall have a rooting depth not in excess of the vegetative layer thickness.

12. The use of compost or dried sewage sludge as a soil amendment in final cover to promote vegetative growth is allowed on WMUs 1 to 7 provided it's applied at agronomic rates and there is no threat to water quality from storm water runoff.

13. 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.

Closure of WMUs 4 and 5

14. WMUs 4 and 5 shall be closed in accordance with the Final Closure Plan for these units and shall receive a final cover in accordance with the prescriptive standards of Title 27 and Subtitle D, or one of the two EAD described below.

    Option 1 from top to bottom is as follows:
    - Erosion-resistant/vegetative cover layer – One foot vegetative cover soil
    - Low hydraulic conductivity /barrier layer – One foot of compacted clay ($k \leq 1 \times 10^{-6}$ cm/sec)
    - Foundation layer – Two feet of compacted soil or existing intermediate cover.

    The proposed design Option 1 is prescriptive under Title 27 but is an EAD to the prescriptive standard of Subtitle D, which requires that the barrier layer be at least 18 inches thick ($k \leq 1 \times 10^{-5}$ cm/sec). The Discharger has demonstrated, however, that the proposed Title 27 design is more stringent than Subtitle D, given that the

maximum hydraulic conductivity of the proposed barrier layer will be one-tenth of the maximum allowed under Subtitle D. Further, the vegetative cover layer will be six inches thicker than that required under Subtitle D, providing additional protection from infiltration. As part of the cover design, this Order requires the Discharger to demonstrate that use of a clay-only cover will meet the Title 27 performance standards given the potential for desiccation cracking of the clay layer.

Option 2 from top to bottom is as follows:

- Erosion-resistant/vegetative cover layer – One foot vegetative cover soil
- Geocomposite drainage layer (geonet with geotextile bonded on both sides) - side slope only
- 40 mil linear low-density polyethylene (LLDPE) geomembrane low hydraulic conductivity /barrier layer w/surface texturing (asperity height) of at least 20-mil on both sides
- Foundation layer – One foot of prepared existing intermediate cover.

15. For the prescriptive cover (Option 1), the low hydraulic conductivity layer for WMU 4 shall have a maximum hydraulic conductivity of 1×10^{-6} cm/sec and a minimum relative compaction of 90%. The low hydraulic conductivity layer for WMU 5 shall have a maximum hydraulic conductivity of 1×10^{-6} cm/sec, or equal to the permeability of the underlying clay liner, whichever is less. Hydraulic conductivities of cap materials shall be determined by laboratory tests using water. As part of final design, the Discharger shall demonstrate that use of a clay-only cover will meet the Title 27 performance standards given the potential for desiccation cracking of the clay layer.

    For the geomembrane cover (Option 2), the geomembrane for WMUs 1 through 5 shall be a minimum 40-mil LLDPE with surface texturing (asperity height) of at least 20 mils on both sides.

16. WMUs 4 and 5 are nearing final grades. The Discharger shall complete the closure of WMU-4 and 5 by 15 October 2019, in accordance with Cease and Desist Order R5-2011-0076 Extension Letter dated 31 July 2013.

Closure of WMUs 6 and 7

17. WMUs 6 and 7 shall be incrementally closed in accordance with the Preliminary Closure Plan for these units. Each module shall receive a final cover in accordance with the EAD described below.

    The engineered alternative final cover shall consist of, from top to bottom, the following layers:

    - One-foot vegetative layer of soil or other materials capable of supporting vegetation.

- A double-sided drainage geocomposite with a transmissivity value equal to $1x10^{-4}$ m^2/sec.
- A 40-mil linear low density polyethylene liner (LLDPE) with surface texturing (asperity height) of at least 20 mils on both sides.
- A low permeable geosynthetic clay liner (GCL) with a permeability equal or less than $1x10^{-8}$ cm/sec.
- Two-foot soil foundation layer.

Closure of Anaerobic Compost Cells

18. The Discharger shall submit a Final Closure Plan for review and approval by the Executive Officer 180 days prior to closure of the anaerobic compost cells.

19. At closure of the anaerobic compost cells, the Discharger shall de-commission and close the anaerobic compost cells per an Executive Officer approved Closure Plan. One or more cells may remain in operation as others are closed. As part of de-commissioning, compost and waste materials will be removed from the anaerobic compost cells. Any remaining liquids will be pumped out of the impoundment. Pumped liquids will either be discharged to a remaining impoundment or to tanks for offsite disposal at an authorized facility. Residual sludges/solids will also be removed and discharged to an authorized onsite unit or offsite facility. The containment system components will then be removed to eliminate ponding and leachate migration within landfill WMU from the anaerobic compost cells. The containment system components will also be disposed of at an onsite unit or offsite facility.

20. The Discharger shall backfill and grade the area with materials authorized for disposal in the landfill WMU. After the closure of the anaerobic compost cells is complete, the Discharger shall conduct regular maintenance activities associated with the landfill WMU.

Closure of Surface Impoundments

21. At closure of the Class II surface impoundments, the Discharger shall clean-close the units pursuant to Title 27 section 21400(b)(1). All precipitates, residual wastes, including liquids, sludges, settled solids, liner materials, and adjacent natural geologic materials contaminated by wastes shall be completely removed and discharged to a waste management unit approved by Regional Water Board staff. If after reasonable attempts to remove contaminated natural geologic materials, the Discharger demonstrates that removal of all remaining contamination is infeasible, the impoundment and/or overflow basins shall be closed as a landfill pursuant to Title 27 section 21400(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.

22. The closure of each surface impoundment shall be under the direct supervision of a California registered civil engineer or certified engineering geologist.

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 landfill in at least the amounts of $77.6 and $ 18.7 million described in Findings 127 and 128, adjusted for inflation annually. A report regarding financial assurances for closure and post-closure maintenance shall be submitted to the Central Valley Water Board by **28 August of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.

2. The Discharger shall update the 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(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 thirty years of post-closure maintenance. Reports regarding financial assurance required in F.1 above shall reflect the updated cost estimate.

3. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill in at least the amount of the annual inflation-adjusted cost estimate of $2.1 million described in Finding 129. A report regarding financial assurances for corrective action shall be submitted to the Central Valley Water Board by **28 August of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.

4. If future WMUs are constructed with a minimum elevation below 22 feet msl, the Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for additional post-closure maintenance costs associated with operations and maintenance activities required to maintain groundwater separation. The cost estimate shall include a lump sum estimate of the cost of carrying out all

actions necessary to maintain groundwater separation for 450 years[4] of post-closure maintenance. Instead of multiplying the annual postclosure maintenance cost by 450, the Discharger may establish a perpetual fund whereby only the interest earned in the fund is utilized to cover postclosure maintenance costs. The post-closure financial assurances shall be in place prior to placing waste in the WMU. A report regarding financial assurances for closure and post-closure maintenance shall be submitted to the Central Valley Water Board by **28 August of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.

5. The Discharger shall comply with all Standard Financial Assurance Specifications listed in Section H of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

G. MONITORING SPECIFICATIONS

1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with Monitoring and Reporting Program (MRP) R5-2016-0094, and the Standard Monitoring Specifications listed in Section I of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

2. The Discharger shall, for any landfill unit in a corrective action monitoring program, comply with the corrective action monitoring program provisions of Title 27, MRP R5-2016-0094, and the Standard Monitoring Specifications listed in Section I of SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

3. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, MRP R5-2016-0094, and the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

4. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the landfill unit that extends through the uppermost aquifer underlying the unit) shall not exceed the concentration limits established pursuant to MRP R5-2016-0094.

[4] 450 years is equivalent to the life prediction for non-exposed, high density polyethylene geomembrane liner at 20 degrees Celsius, per GRI White Paper #6, Geomembrane Lifetime Predictions by Robert M. Koerner, Y. Grace Hsuan and George R. Koerner, original date 7 June 2005, updated 8 February 2011.

5. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in MRP R5-2016-0094 and the Standard Monitoring Specifications in Section I of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

6. As specified in MRP R5-2016-0094, the Discharger shall enter all monitoring data and monitoring reports into the online Geotracker database as required by Division 3 of Title 27 and Chapter 30, Division 3 of Title 23.

7. As specified in MRP R5-2016-0094, the Discharger shall conduct corrective action monitoring and demonstrate the effectiveness of the corrective action program in accordance with Title 27, section 20430.

8. The Discharger shall comply with all Standard Monitoring Specifications and Response to a Release specifications listed in Sections I and J of the SPRRs dated December 2015 which are attached hereto and made part of this Order by reference.

H. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the facility, including the MRP R5-2016-0094 and the SPRRs dated December 2015 which are part of this Order, and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

2. The Discharger shall comply with all applicable provisions of Title 27 and Subtitle D that are not specifically referred to in this Order.

3. The Discharger shall comply with MRP R5-2016-0094, which is incorporated into and made part of this Order by reference.

4. 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, which are attached hereto and made part of this Order by reference.

5. 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.

6. All reports required by this Order shall be submitted pursuant to Water Code section 13267.

7. The Discharger shall maintain legible records of the volume and type of waste discharged to the WMUs and the manner and location of the discharge. Such

records shall be maintained at the facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the Central Valley Water Board and of the State Water Resources Control Board, and copies of these records shall be sent to the Central Valley Water Board upon request.

8. The Discharger shall complete the tasks contained in these waste discharge requirements in accordance with the following time schedule:

Task	Compliance Date
A. Construction Plans Submit construction and design plans for review and approval. (See all Construction Specifications in Section D, above and Section F of the SPRRs.)	**90 days prior to proposed construction**
B. Construction Report Submit a construction report for review and approval upon completion demonstrating construction was in accordance with approved construction plans (see Standard Construction Specification F.27 in the SPRRs).	**60 days prior to proposed discharge**
C. Final Closure Plans 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 SPRRs).	**Two years prior to closure**
D. WMU 4 and 5 Closure Submit design plans, and CQA plan for review and approval for WMU 4 and 5 (see all Closure and Post-Closure Specifications in Section E, above and Section G of the SPRRs).	**15 October 2017**
E. WMU 4 and 5 CQA Report Submit a WMU 4 and 5 Final Cover construction report for review and approval upon completion demonstrating construction was in accordance with	**2 January 2020**

approved construction plans (see Standard Construction Specification F.27 in the SPRRs).

F. Surface Impoundment O&M Plan	**15 August 2017 and 60 days prior to operational changes**

The Discharger shall submit a revised Surface Impoundment O&M Plan to the Regional Water Board if any changes to the operations and/or maintenance of the surface impoundments are to occur. The Surface Impoundment O&M Plan shall outline strategies and methods for evaporating leachate, minimizing vectors and odors, managing pond levels, conducting liner inspections, cleaning the ponds and other relevant information and detail how the changes will maintain compliance with this Order and Title 27. The plan shall include calculations as to the amount of leachate expected to be generated in and pumped from the LCRS back into the impoundment under normal operations in the absence of a liner failure. The plan shall identify the failure criteria of the upper liner and include a response plan in the event of an upper liner failure.

G. Bioreactor O&M Plan	**90 days prior to proposed discharge**

Submit a Bioreactor Liquids Management Plan detailing the proposed bioreactor liquids injection procedures, associated monitoring, RD&D permitting timeframes (i.e. RD&D permit renewal date and years remaining of the 12 year RD&D liquids variance), and proposed discharge date.

H. Water Quality Protection Standards Report	**1 July 2017**

Submit a WQPS report for review and approval. The Discharger shall develop a complete list of concentration limits for each landfill unit and submit a WQPS Report describing the WQPS for each unit consistent with the requirements of this Order and detailed in MRP R5-2016-0094 C.1.

I. Sampling and Analysis Plan	**1 July 2017**
Submit an updated *Sample Collection and Analysis Plan* detailing the facility sampling and analysis procedures that comply with MRP R5-2016-0094 requirements including soil pore gas and quality assurance/quality control standards.	
J. Flood Berm Evaluation Report	**15 July 2017**
Submit a Flood Berm Evaluation Report detailing the flood elevation for a flood with a 100-year return period and demonstrate that WMUs are designed, constructed, and operated to prevent inundation or washout from this flood event. If the existing WMUs are not protected from flooding from a 100-year return period event, the report shall include a schedule for protecting the WMUs from inundation or washout by a flood with a 100-year return period by **15 October 2019.**	
K. Compost Pad Construction	**90 days prior to proposed construction**
Design plans and construction quality assurance (CQA) plans shall be submitted for the composting area upgrades for review and approval at least 90 days prior to construction. Alternately, the Discharger may submit a demonstration, certified by a California registered Civil Engineer or Engineering Geologist that the existing working surface at the Wood and Yard Waste Facility meets the requirements of Construction Specification D.14.	
L. Compost Pad Construction Report	**15 December 2017**
Submit a Compost Pad construction report for review and approval upon completion demonstrating construction was in accordance with approved construction plans (see Standard Construction Specification F.27 in the SPRRs).	

M. Anaerobic Compost Cell O&M Plan	**90 days prior to proposed construction and 60 days prior to operational changes**
The Anaerobic Compost Cell O&M Plan shall outline strategies and methods for anaerobic composting activities, minimizing vectors and odors, conducting inspections, excavating compost, and other relevant information and detail how the operations will maintain compliance with this Order and Title 27. The plan shall include Action Leakage Rate calculations for the amount of leachate expected to be generated in and pumped from the leak detection layer under normal operations in the absence of a liner failure. The plan shall identify the failure criteria of the liner and include a response plan in the event of an upper liner failure.	
N. WMU 3 Cover Demonstration Report	**90 days Prior to Closure of WMU 6 and 7**
The WMU 3 Cover Demonstration Report shall provide the monitoring and evaluation results for the two test covers constructed as part of the WMU 3 closure construction project detailed in Finding 109.	

9. The Discharger shall comply with all General Provisions listed in Section K of the SPRRs dated December 2015 which are part of this Order.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 6 December 2016.

ORIGINAL SIGNED BY

_____

PAMELA C. CREEDON, Executive Officer

AAH/WMH

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2016-0094
FOR
COUNTY OF YOLO
PLANNING AND PUBLIC WORKS DEPARTMENT
YOLO COUNTY CENTRAL LANDFILL
CLASS III LANDFILLS, CLASS II SURFACE IMPOUNDMENTS, AND COMPOSTING
CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE MAINTENANCE,
AND CORRECTIVE ACTION
YOLO COUNTY

This monitoring and reporting program (MRP) is issued pursuant to California Water Code section 13267 and incorporates requirements for groundwater, surface water, and unsaturated zone monitoring and reporting; facility monitoring, maintenance, and reporting; and financial assurances reporting contained in California Code of Regulations, title 27, section 20005, et seq. (hereafter Title 27), Waste Discharge Requirements (WDRs) Order R5-2016-0094, and the Standard Provisions and Reporting Requirements (SPRRs) dated December 2015. Compliance with this MRP is ordered by the WDRs and the Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Central Valley Water Board or the Executive Officer.

A. MONITORING

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

All compliance monitoring wells established for the detection and corrective action monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. 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. Additional compost and landfill gas corrective action monitoring parameters and constituents of concern (COCs) shall be sampled and reported in accordance with Tables VII through VIII.

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
A.3	Waste Monitoring
A.4	Leachate Monitoring, Seep Monitoring, and LCRS Testing
A.5	Surface Water Monitoring
A.6	Compost Operations Monitoring
A.7	Facility Monitoring
A.8	Corrective Action Monitoring

1. Groundwater Monitoring

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. The detection monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27. The current groundwater detection monitoring system 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.

a. Groundwater Detection Monitoring

WMUs 1 through 5 and G are in corrective action; the corrective action monitoring program is found in Section A.8. The current groundwater detection monitoring network for WMUs 6 and H consist of the following:

Well	Status	Zone	Units Being Monitored
OW10	Background	Shallow	WMU 6A, 6B
LPTZA	Background	Shallow	WMU 6A
OW9	Detection	Shallow	WMU 6A, 6B, 6C, 6D
EW10	Detection	Shallow	WMU 6A, 6B, 6C, 6D
EW16	Detection	Shallow	WMU 6A, 6B, 6C, 6D
LTPZB	Background	Shallow	WMU 6B
LTPZC	Background	Shallow	WMU 6C
OW15	Background	Shallow	WMU 6C
LTPZD	Background	Shallow	WMU 6D
OW14	Background	Shallow	WMU 6D, H
OW23	Detection	Shallow	WMU 6D, H
SIMW5	Background	Shallow	WMU H
OW17	Background	Shallow	WMU H

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

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 2015 and shall be monitored again in **2020.** The results shall be reported in the Annual Monitoring Report for the year in which the samples were collected.

b. Groundwater Elevation Monitoring

Once per quarter, the Discharger shall measure the groundwater elevation in each well, calculate the separation between groundwater and waste in all of the WMUs, calculate the separation between groundwater and the capillary break liner for WMUs 6 and 7, determine groundwater flow direction, and estimate groundwater flow rates in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored. The results shall be reported semiannually, including the times of expected highest and lowest elevations of the water levels in the wells, pursuant to Title 27, section 20415(e)(15).

c. Groundwater Extraction

Extraction wells are utilized to maintain groundwater separation for WMU 6A. The groundwater extraction well network to maintain groundwater separation at WMU 6A consists of the following:

Extraction Well	Zone	Modules Being Addressed
EW09	Shallow	WMU 6
EW10	Shallow	WMU 6
EW11	Shallow	WMU 6
EW12	Shallow	WMU 6
EW13	Shallow	WMU 6
EW14	Shallow	WMU 6
EW15	Shallow	WMU 6
EW16	Shallow	WMU 6

The Discharger shall record the total flow for each extraction well and the groundwater extraction system and report them in the Semiannual Monitoring Report required in Section B.1 of this MRP. All shutdowns of the landfill groundwater extraction system, regardless of the type of restart, shall be

summarized and tabulated in the Semiannual Monitoring Reports. The summary shall include the start/stop dates, and the cause of the shutdown. The Discharger shall also include the total flow to the air stripper treatment system and influent and effluent monitoring results required by Non-15 WDR R5-2002-0078. If Non-15 WDR R5-2002-0078 is updated, the air stripper treatment system influent and effluent monitoring results required by the most current Non-15 WDRs shall be summarized in this Order.

2. Unsaturated Zone Detection and Corrective Action Monitoring

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 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 consists of:

Mon Pt.	Lysimeter Type	Status	Units Being Monitored
6B-N-LYS	Pan	Corrective Action	WMU 6B
6B-S-LYS	Pan	Corrective Action	WMU 6B
6C-N-LYS	Suction	Not Functioning	WMU 6C
6C-S-LYS	Suction	Corrective Action	WMU 6C
6D1-E-LYS	Pan	Detection	WMU 6D1
6D1-W-LYS	Pan	Detection	WMU 6D1
6D2-E-LYS	Pan	Detection	WMU 6D2
6D2-W-LYS	Pan	Detection	WMU 6D2
G-LYS-1	Suction	Corrective Action	WMU G
G-LYS-2	Suction	Detection	WMU G
G-LYS-3	Suction	Detection	WMU G
H1-LYS	Suction	Detection	WMU H1
H2-LYS	Suction	Detection	WMU H2
H3-E-LYS	Suction	Detection	WMU H3
H3-W-LYS	Suction	Detection	WMU H3

The current soil pore gas monitoring network consists of:

Mon Pt.	Status	Status	Units Being Monitored
P1	Existing	Detection	WMU 3
P2	Existing	Detection	WMU 2
P3	Existing	Detection	WMU 2
P4A	Existing	Detection	WMU 2
P5	Existing	Detection	WMU 1
P6	Existing	Detection	WMU 1

Mon Pt.	Status	Status	Units Being Monitored
P7	Existing	Detection	WMU 1
P8	Existing	Detection	WMU 3
P9	Proposed	Detection	WMU 5
P10	Proposed	Detection	WMU 6A
P11	Proposed	Detection	WMU H2
P12	Proposed	Detection	WMU 6C

The Discharger is proposing to install additional soil gas probes that may also serve as unsaturated zone monitoring devices. Following 12 months of data collection from the new soil gas probes associated with WMU 6CN G and H2, the Discharger may substitute monitoring the unsaturated zone with the soil gas probes and eliminate monitoring suction lysimeters in areas where the soil gas probes monitor the WMU unsaturated zone following Executive Officer approval.

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. Lysimeters need only be sampled when liquid is present. Lysimeters shall be inspected for the presence of liquid **monthly**. Liquids above the invert elevation of the pipe that goes into the manhole in 6B-N-LYS and 6B-S-LYS shall be removed. If liquid is detected in a previously dry pan lysimeter, the Discharger shall notify Central Valley Water Board staff by phone and email within **seven days** and shall immediately sample and test the liquid for Field and Monitoring Parameters listed in Table II. Liquid shall be removed and appropriately disposed of immediately after samples are collected. 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 **2020** (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. Waste Monitoring

The Discharger shall monitor and report all wastes discharged to each landfill WMU, bioreactor, and anaerobic compost cell on a monthly basis as follows:

Nonhazardous Solid Waste and Liquid Monitoring

Parameter	Units	Reporting Frequency
Source(s) of material discharged	---	Semi-annually
Maximum discharge elevation	MSL feet & tenths	Semi-annually
Results of Load Checking Program	---	Semi-annually
Quantity discharged	Cubic yards or tons	Semi-annually
Type of material discharged	---	Semi-annually
Capacity of landfill/module remaining	Percent	Annually
Quantity of Leachate Recirculated	gallons	Semi-annually
Quantity of Landfill Gas Condensate Recirculated	gallons	Semi-annually
Source(s) and type(s) of Additional Liquids for Bioreactors	---	Semi-annually
Quantity of Additional Liquids for Bioreactors	gallons	Semi-annually

Liquid and Semi-solid Waste Monitoring

The Discharger shall monitor all wastes discharged to the Class II Surface Impoundments on a daily basis and report to the Regional Board as follows:

Parameter	Units	Reporting Frequency
Quantity discharged	gallons or tons	Semi-annually
Type of liquid discharged	---	Semi-annually
Capacity remaining	Percent/gallons	Semi-annually
Source of material discharged	---	Semi-annually
Minimum freeboard	Feet & tenths	Semi-annually
Solids removed	cubic yards or tons	Semi-annually
Discharge location for solids removed	---	Semi-annually
Liquids removed	gallons	Semi-annually
Discharge location for liquids removed	---	Semi-annually

As detailed in the WDR, surface Impoundment liquids classified as non-hazardous and non-designated may be discharged to an anaerobic compost cell, into a bioreactor landfill unit under the RD&D permit, or used as dust control on composite lined landfill units. However, prior to these discharge activities, the Discharger shall analyze the liquids within the Class II Surface Impoundments for the parameters listed in Table I, with the exception of

groundwater elevation, and include the results in the Semiannual Monitoring Reports as required in Section B.1.

4. Leachate Monitoring, Seep Monitoring, and Annual LCRS Testing

a. Leachate Monitoring

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

The current LCRS leachate sump monitoring points are:

Mon Pt.	Unit Where Sump is Located
LPS1	WMU 1, 2, 3, 4, 5
LPS2	WMU 6A, 6B, 6C
6D1-E-LS	WMU 6D1
6D1-W-LS	WMU 6D1
6D2-E-LS	WMU 6D2
6D2-W-LS	WMU 6D2
Pressure Transducers	Bioreactor Landfill WMUs
G-LD	WMU G
H1-LD	WMU H1
H2-LD	WMU H2
H3-E-LD	WMU H3
H3-W-LD	WMU H3
CEC-SC	WMU 6B, Bioreactor demonstration cell

All LCRS sumps shall be inspected monthly for the presence of leachate, hydraulic head in bioreactor WMUs shall be monitored continuously, and flow shall be 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. Liquids shall be removed and appropriately disposed of immediately after samples are collected. Leachate in the LCRS sump shall then be sampled for all parameters and constituents in accordance with the frequencies listed in Table III whenever liquid is present. All LCRS sump samples shall be analyzed for the 5-year COCs specified in Table III every five years, beginning again in **2020.**

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 Section B.3 of this MRP, below.

c. Annual LCRS Testing

All LCRSs shall be tested annually pursuant to Title 27, section 20340(d) to demonstrate proper operation. 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.

5. Surface Water Monitoring

The Discharger has reported that no surface water from waste discharge areas regulated by these WDRs flows off-site. Surface water flows into one of the three on-site storm water retention ponds (i.e. Stormwater Pond 1 to 3) or the water storage reservoir. Semiannually, when water is present, the Discharger shall sample and analyze each on-site storm water retention ponds and the water storage reservoir for the parameters listed in Table IV. All storm water retention pond samples shall be analyzed for the 5 year COCs specified in Table VI every five years, beginning in 2020.

6. Compost Operations Monitoring

a. Monitoring

1) **Biosolids/Anaerobic Digestate**

If biosolids are used as a feedstock, the Discharger shall perform monitoring to characterize the material for the parameters listed in Table VII. The characterization shall contain a description of the sample procedures, the analytical report, and a statement by a responsible person that the characterization was performed in a way that accurately characterizes the quality of the biosolids.

2) **LCRS**

The Discharger shall operate and maintain leachate collection and removal system (LCRS) sumps, conduct monitoring of any detected leachate seeps, and conduct annual testing of each LCRS in accordance with Title 27, the Anaerobic Compost Cell Operation and Maintenance Plan, and this monitoring program.

The anaerobic compost cells are not constructed yet; therefore, there are not any current LCRS sump monitoring points.

All LCRS sumps shall be inspected monthly for the presence of leachate, hydraulic head, and flow. Total flow shall be recorded monthly and reported in Semi-Annual Reports.

3) **Secondary Leachate Monitoring**

The anaerobic compost cells are not constructed yet; therefore, there are not any current secondary leachate monitoring points.

All secondary leachate collection sumps shall be inspected monthly for the presence of leachate, hydraulic head, and flow. Total flow shall be recorded monthly and reported in Semi-Annual Reports.

b. Inspections

1) **Anaerobic Compost Cell Cover**

Anaerobic compost cells shall be inspected for leachate seeps daily when liquids are added, weekly when only leachate is being recirculated, and after major storm events.

2) **Anaerobic Compost Cell Liner System**

Within two weeks following excavation, the Discharger is required to inspect the exposed portions of the anaerobic compost cell composite base liner system for damages. Repairs shall be completed prior to the discharge of additional waste materials into the anaerobic compost cells. The results for the inspections and associated repairs shall be included in semi-annual monitoring reports.

3) **Quarterly**

The Discharger shall perform quarterly inspections of the working surfaces, berms, ditches, facility perimeter, erosion controls, and any other operational surfaces identified in this Order. The Discharger shall include the following observations in the Semiannual Monitoring Report as required in Section B.1 of this MRP:

a) Date and time of inspections, along with the name of the inspector;

b) Evidence of areas of deficiency such as cracking or subsidence in the working surfaces;

c) Evidence of ponding over the working surfaces and within ditches (show affected area on a map);

d) Effectiveness of erosion controls;

e) Maintenance activities associated with, but not limited to, the working surfaces, berms, ditches, and erosion controls;

f) Evidence of any compost wastewater leaving the compost facility, estimated size of affected area, and estimated flow rate (show affected area on a map);

g) Integrity of drainage systems during the wet season (15 October though 15 May); and

h) Photographs of observed and corrected deficiencies.

4) **Annual**

The Discharger shall perform an annual inspection of the facility to confirm that all containment structures are prepared for the pending wet season. The Discharger shall conduct an annual inspection prior to the anticipated wet season, but no later than 30 September and complete any necessary construction, maintenance, or repairs by **31 October**. The Discharger shall include the following in the Annual Facility Inspection Report as required in Section B.4 of this MRP:

a) The observation date and time of the inspection, along with the name of the inspector

b) The type of deficiency/non-compliance observed;

c) The cause for the deficiency/noncompliance;

d) Map showing the area of deficiency/noncompliance;

e) The corrective actions undertaken, or planned to resolve the deficiency/non- compliance, including the date and time of repairs;

f) The measures undertaken by the Discharger to prevent the recurrence of the observed deficiency/noncompliance; and

g) Photographs of the observed deficiencies/noncompliance with corresponding location on the map

7. Facility Monitoring

a. Annual Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess repair and maintenance needed for drainage control systems, cover systems, and groundwater monitoring wells; and shall assess preparedness for winter conditions (including but not limited

to erosion and sedimentation control). The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. Annual facility inspection reporting shall be submitted as required in Section B.4 of this MRP.

b. Major Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities and all landfill side slopes for damage **within 7 days** following major storm events capable of causing damage or significant erosion. The Discharger shall take photos of any problems areas before and after repairs. Necessary repairs shall be completed **within 30 days** of the inspection. Notification and reporting requirements for major storm events shall be conducted as required in Section B.5 of this MRP.

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, section 21090(e)(1 & 2)]. Reporting shall be in accordance with Section B.6 of this MRP. The next iso-settlement survey of WMU 1 and 2 shall be conducted in 2017.

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/Operation/Event
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
Bioreactor	Daily	When liquids are added
Bioreactor	Weekly	When only leachate is being recirculated
Bioreactor	Immediately following	Major Storm Event

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 shall be submitted in the semiannual monitoring reports required in Section B.1 of this MRP.

8. 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. Note that Unsaturated Zone corrective action monitoring is found in Section A.2.

a. Groundwater Corrective Action Monitoring

WMUs 1 to 5 and WMU G are in corrective action. The current groundwater corrective action monitoring network consists of the following:

Well	Status	Zone	Units Being Monitored
OW1	Background	Shallow	WMU 1, 2
OW4	Background	Shallow	WMU 1, 2
OW5	Background	Shallow	WMU 1, 2, 3
OW6	Background	Shallow	WMU 3
OW7	Background	Shallow	WMU 4, 5
OW8	Corrective Action	Shallow	WMU 4, 5
OW24	Background	Shallow	WMU 4, 5
SIMW1	Background	Shallow	WMU G
OW3	Corrective Action	Shallow	WMU 1, 2
OW17	Corrective Action	Shallow	WMU 1, 2
OW18	Corrective Action	Shallow	WMU 1, 2, G

Well	Status	Zone	Units Being Monitored
OW26	Corrective Action	Shallow	WMU 3
OW27	Corrective Action	Shallow	WMU 3
EW02	Corrective Action	Shallow	WMU 4, 5
EW07	Corrective Action	Shallow	WMU 4, 5
SIMW4	Corrective Action	Shallow	WMU G
DW2	Corrective Action	Deep	WMU 1, 2, G
DW8	Corrective Action	Deep	WMU 1, 2
DW6	Corrective Action	Deep	WMU 3
DW7	Corrective Action	Deep	WMU 4, 5

The monitoring schedule for the corrective action wells shall be the same as for the detection monitoring in accordance with Section A.1.a and A.1.b.

b. Groundwater Extraction

The corrective action groundwater extraction well network is as follows:

Extraction Well	Zone	Modules Being Addressed
EW01	Shallow	WMU 1-5
EW02	Shallow	WMU 1-5
EW03	Shallow	WMU 1-5
EW04	Shallow	WMU 1-5
EW05	Shallow	WMU 1-5
EW06	Shallow	WMU 1-5
EW07	Shallow	WMU 1-5
EW08	Shallow	WMU 1-5

The Discharger shall record the total flow for each extraction well and the groundwater extraction system and report them in the Semiannual Monitoring Report required in Section B.1 of this MRP. All shutdowns of the landfill groundwater extraction system, regardless of the type of restart, shall be summarized and tabulated in the Semiannual Monitoring Reports. The summary shall include the start/stop dates, and the cause of the shutdown. The Discharger shall also include the total flow to the air stripper treatment system and influent and effluent monitoring results required by WDR R5-2002-0078. If WDR R5-2002-0078 is updated, the air stripper treatment system influent and effluent monitoring results required by the most current groundwater disposal WDRs shall be summarized in this Order.

The Discharger shall estimate the following annually to assess the progress of groundwater corrective action and reported in the Annual Monitoring Report (including method of calculations) in the format below:

	Mass of Total VOCs (lbs)	
Zone	Amount Removed During Year	Cumulative Amount Removed
Shallow		

c. Landfill Gas Corrective Action System

The LFG control system includes a gas flaring facility, a landfill gas-to-energy plant, and vertical and horizontal extraction wells as shown in Attachment F. The LFG control system is part of the corrective action program at the landfill to prevent VOCs present in LFG from impacting groundwater. Landfill gas migration is monitored by perimeter landfill gas probes 1 to 12, shown on Attachment D.

The Discharger shall conduct the landfill gas corrective action monitoring as shown on Table VIII and shall report the results in the Landfill Gas Corrective Action Annual Report. All shutdowns of the landfill gas extraction system, regardless of the type of restart, shall be summarized and tabulated in the semiannual reports. The summary shall include the start/stop dates, and the cause of the shutdown. In addition, the LFG plant run-time per month and percent down-time per month shall be reported and tabulated in the Landfill Gas Corrective Action Annual Report.

B. REPORTING

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

Reporting Schedule

Section	Report	End of Reporting Period	Due Date
B.1	Semiannual Monitoring Report	30 June, 31 December	**15 August, 15 February**
B.2	Annual Monitoring Report	31 December	**15 February**
B.3	Seep Reporting	Continuous	**Immediately & 7 Days**
B.4	Annual Facility and Compost Area Inspection Report	31 October	**1 December**
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	**28 August**

Section	Report	End of Reporting Period	Due Date
B.8	Landfill Gas Corrective Action Annual Report	31 December	**15 March**

Reporting Requirements

The Discharger shall submit monitoring reports **semiannually** with the data and information as required in this Monitoring and Reporting Program and as required in WDRs Order R5-2016-0094 and the Standard Provisions and Reporting Requirements (particularly Section I: "Standard Monitoring Specifications" and Section J: "Response to a Release"). In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format, such as a computer disk.

Field and laboratory tests shall be reported in each monitoring report. Semiannual and annual monitoring reports shall be submitted to the Central Valley Water Board in accordance with the above schedule for the calendar period in which samples were taken or observations made. In addition, the Discharger shall enter all monitoring data and monitoring reports into the online Geotracker database as required by Division 3 of Title 27 and Chapter 30, Division 3 of Title 23.

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 **15 August** and **15 February**. Each semiannual monitoring report shall contain at least the following:

   a) For each groundwater monitoring point addressed by the report, a description of:

      1) The time of water level measurement;

      2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;

      3) The method of purging used to stabilize water in the well bore before the sample is taken including the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; results of pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water;

      4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and

      5) A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.

   b) A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.

   c) The estimated quarterly groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored based upon water level elevations taken prior to the collection of the water quality data submitted in the report [Title 27, section 20415(e)(15)].

   d) The separation between groundwater and waste in all of the WMUs and the separation between groundwater and the capillary break liner for WMUs 6 and 7. A summary detailing whether or not the Discharger has complies with the groundwater separation requirements in WDR R5-2016-0094, and if not, the changes that will be made to return to compliance.

   e) Cumulative tabulated monitoring data for all monitoring points and constituents for groundwater, unsaturated zone, leachate, and surface water. 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 “<” the reporting limit (e.g., <0.10). Units shall be as required in

Tables I through IV unless specific justification is given to report in other units. Refer to the SPRRs Section I "Standard Monitoring Specifications" for requirements regarding MDLs and PQLs.

f) A summary of the elevations in mean sea level of pan lysimeters, suction lysimeters, and leachate sumps.

g) Laboratory statements of results of all analyses evaluating compliance with requirements.

h) An evaluation of the concentration of each monitoring parameter (or 5-year COC when five year COC sampling is conducted) as compared to the current concentration limits, and the results of any required verification testing for constituents exceeding a concentration limit. Report any actions taken under Section J: Response to a Release for verified exceedances of a concentration limit for wells/constituents not already in corrective action monitoring.

i) 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 or WDR R5-2016-0094 requirements (excluding the leachate sump), and information about the required notification and corrective action in Standard Facility Specification E.13 of the SPRRs. WDR R5-2016-0094 requires a leachate depth for bioreactors and anaerobic compost cells

j) A summary of all of the Waste Monitoring for the reporting period required in Section A.3 of this MRP.

k) A summary of all Compost Operations Monitoring for the reporting period required in Section A.6 of this MRP.

l) The results of the Corrective Action Monitoring described in Sections A.8.a and A.8.b.

m) A summary of all Standard Observations for the reporting period required in Section A.7.d of this MRP.

n) A comprehensive discussion of any Corrective Action Programs required by this MRP under Section A.8.a and A.8.b.

o) Copy of most recent semi-annual report required by Monitoring and Reporting Program R5-2002-0078.

p) A summary of inspection, leak search, and repair of final covers on any closed landfill units in accordance with an approved final post-closure maintenance plan as required by Standard Closure and Post-Closure Maintenance Specifications G.26 through G.29 of the SPRRs.

2. **Annual Monitoring Report:** The Discharger shall submit an Annual Monitoring Report to the Central Valley Water Board by **15 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 within at least the previous five calendar years. If a 5-year COC event was performed, than these parameters shall also be graphically presented. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. Graphical analysis of monitoring data may be used to provide significant evidence of a release.

   b) An evaluation of the monitoring parameters with regards to the cation/anion balance, and a graphical presentation using a Stiff diagram, a Piper graph, or a Schoeller plot.

   c) All historical monitoring data for which there are detectable results, including data for the previous year, shall be submitted in tabular form in a digital file format such as a computer disk. The Central Valley Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27, section 20420(h)], that facilitates periodic review by the Central Valley Water Board.

   d) Hydrographs of each well showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.

   e) A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.

   f) A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours, and include a projection of the year in which each discrete landfill module will be filled.

   g) A written summary of the monitoring results, indicating any changes made or observed since the previous Annual Monitoring Report.

   h) The results of the annual testing of leachate collection and removal systems required under Standard Facility Specification E.14 of the SPRRs.

i) Updated concentration limits for each monitoring parameter at each monitoring well based on the new data set.

j) A comprehensive discussion about the bioreactors operating under Research, Development, and Demonstration Permits including a summary of all monitoring and testing data and an assessment as to whether and to what extent the site is progressing in attaining project goals. This report may be submitted separately or included in the regular annual report.

3. **Seep Reporting:** The Discharger shall report by telephone or email any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the Central Valley Water Board **within seven days**, containing at least the following information:

   a) A map showing the location(s) of seepage;

   b) An estimate of the flow rate;

   c) A description of the nature of the discharge (e.g., all pertinent observations and analyses);

   d) Verification that samples have been submitted for analyses of the Field Parameters and Monitoring Parameters listed in Table III of this MRP, and an estimated date that the results will be submitted to the Central Valley Water Board; and

   e) Corrective measures underway or proposed, and corresponding time schedule.

4. **Annual Facility and Compost Area Inspection Reporting:** By **1 December** of each year, the Discharger shall submit a report describing the results of the inspection and the repair measures implemented, preparations for winter, and include photographs of any problem areas and the repairs. Refer to Section A.7.a of this MRP, above. In addition, the Discharger shall report the results of the compost facility annual inspection required in Section A.6.b.4 of this MRP.

5. **Major Storm Event Reporting:** Following major storm events capable of causing damage or significant erosion, the Discharger shall **immediately** notify Central Valley Water Board staff of any damage or significant erosion upon discovery and report subsequent repairs within **14 days** of completion of the repairs, including photographs of the problem and the repairs. Refer to Section A.7.b of this MRP, above.

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(e). Refer to Section A.7.c of this MRP, above. The next report is due by 2017.

7. **Financial Assurances Report:** By **28 August** of each year, the Discharger shall submit a copy of the annual financial assurances report due to CalRecycle that updates the financial assurances for closure, post-closure maintenance, and corrective action. Refer to Financial Assurances Specifications F.1 through F.4 of the WDRs.

8. **Landfill Gas Corrective Action Report:** The Discharger shall submit a Landfill Gas Corrective Action Annual Monitoring Report to the Central Valley Water Board by **15 March** covering the reporting period of the previous monitoring year. The report shall include:

   a) The results of the Landfill Gas Corrective Action Monitoring described in Sections A.8.c.

   b) A comprehensive discussion of the Landfill Gas Corrective Action Programs required by this MRP under Section A.8.c.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

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

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

The report shall:

a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a waste management unit or portion of a unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.

b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with Title 27, section 20405.

c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

d. Include a proposed statistical method for calculating concentration limits for monitoring parameters and constituents of concern that are detected in 10% or greater of the background data (naturally-occurring constituents) using a statistical procedure from Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E).

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

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

The Water Quality Protection Standard shall be updated annually for each monitoring well using new and historical monitoring data.

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 VIII for the specified monitored medium.

3. Constituents of Concern (COCs)

The COCs include a larger group of waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit, and are required to be monitored every five years [Title 27, sections 20395 and 20420(g)]. The COCs for all waste management units at the facility are those listed in Tables I through IV, Table VII, and Table VIII for the specified monitored medium, and Table VI. The Discharger shall monitor all COCs every five years, or more frequently as required in accordance with a Corrective Action Program. The last 5-year COC report was submitted to the Central Valley Water Board in the 2015 *Annual Monitoring Report*, and 5-year COCs are due to be monitored again in **2020.**

4. Concentration Limits

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

a. By calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or

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

Concentration limits for all monitoring parameters and constituents-of-concern shall be calculated anew every four (4) monitoring events using data collected during each monitoring event and including all available historical background data. Any data point that tests as an outlier shall not be used in the data set.

The concentration limit for non-naturally occurring organic constituents shall be the method detection limit.

Concentration limits for inorganic constituents shall be calculated using intrawell tolerance limit as required in Section A.1 and Section A.8, above. Parameters not requiring concentration limits include temperature, oxygen reduction potential, turbidity, and dissolved oxygen. The upper tolerance limit shall be used for all constituents and parameters except for pH for which both upper and lower limits shall be calculated. The table below specifies the wells for the current WMUs.

WMU	Monitoring Method	Background Wells	Detection Wells
WMUs 1 & 2	Intrawell	OW1, OW4, OW5	OW17, OW18, OW3, DW2[1], DW8[1]
WMU 3	Intrawell	OW5, OW6	OW26, OW27, DW6[1]
WMU 4 & 5	Intrawell	OW7, OW24	OW8, EW2, EW7,

WMU	Monitoring Method	Background Wells	Detection Wells
WMU 6A	Intrawell	OW10, LTPZA	OW9, EW10, EW16 DW6[1]
WMU 6B	Intrawell	OW10, LTPZB	OW9, EW10, EW16
WMU 6C	Intrawell	OW15, LTPZC	OW9, EW10, EW16
WMU 6D	Intrawell	OW14, LTPZD	OW9, OW23, EW10, EW16
WMU G	Intrawell	SIMW1	OW18, SIMW4, DW2[1]
WMU H	Intrawell	OW14, OW17, SIMW5	OW23, SIMW4

[1] Deep detection wells. All other wells are shallow detection wells.

A **parametric tolerance limit** shall be calculated if the background data set passes a normality test using the Coefficient of Variation Test, and if less than 50 percent of the data is non-detect. If the data tests as normally distributed and greater than 15 percent but less than 50 percent of the background data is non-detect, the mean and standard deviation of the data set shall be adjusted using the Aichison's Method and a tolerance limit shall be calculated using the adjusted values.

A **nonparametric tolerance limit** shall be calculated when the background data set contains greater than 50 percent non-detects (except when normally distributed and greater than 15 percent of the data is non-detect), and/or the data distribution is not normal or transformed normal. A concentration limit shall only be calculated using this method when the data set contains enough points to achieve a false positive rate of 5 percent or less.

The methods for calculating concentration limits were included in the 2015 Annual Monitoring Report. Intrawell tolerance limits are determined using each well as its own background to calculate the limits.

The most recent concentration limits for select parameters as reported in the 2015 *Annual Monitoring Report* were as follows:

Background Well	Analysis Type	pH (Std units)	EC[1] (umhos/cm)	Chloride (mg/L)[3]	Nitrate as N (mg/L)	Sulfate (mg/L)	TDS[2] (mg/L)
EW10	Intrawell	6.88 – 8.21	2994	305.1	6.7	NE[4]	1976
EW16	Intrawell	7.11 – 8.20	NE[5]	148.9	5.0	302.5	1123
LTPZA	Intrawell	7.05 – NE[4]	NE[5]	324	9.6	NE[5]	NE[5]
LTPZB	Intrawell	6.86 – NE[5]	5306	664.4	8.7	1891	4291
LTPZC	Intrawell	NE[5] – NE[5]	5453	535.5	10.2	2001	4460
LTPZD	Intrawell	6.87 – NE[4]	5012	519.3	9.8	1882	3973
OW10	Intrawell	6.96 – NE[4]	1693	144.5	1.7	161.8	1012
OW14	Intrawell	6.60 – NE[4]	2650	306.3	NE[5]	105.2	1500
OW15	Intrawell	6.61 – 7.94	3002	263.6	0.8	181.5	1655
OW17	Intrawell	7.21 – NE[4]	2170	348.5	4.9	286.5	1438
OW23	Intrawell	6.79 – 8.23	3162	408.5	NE[5]	735.8	2053

Background Well	Analysis Type	pH (Std units)	EC[1] (umhos/cm)	Chloride (mg/L)[3]	Nitrate as N (mg/L)	Sulfate (mg/L)	TDS[2] (mg/L)
SIMW4	Intrawell	6.75 – 8.38	NE[5]	244.4	1.7	NE[5]	1416
SIMW5	Intrawell	5.98 – 9.10	NE[5]	NE[5]	8.8	NE[5]	NE[5]

[1] Electrical Conductivity
[2] Total Dissolved Solids
[3] Milligrams per liter
[4] Limit not established because the alpha level was greater than 5%.
[5] Limit not established due to the presence of a statistically significant increasing trend for this parameter for this well.

5. Retesting Procedures for Confirming Evidence of a Release

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

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

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

6. Point of Compliance

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

Cell or Module	Point of Compliance Monitoring Wells
WMU 1, 2	OW17, OW18
WMU 3	OW26, OW27
WMU 4, 5	OW8, EW2, EW7
WMU 6A	OW9. EW10, EW16
WMU 6B	OW9. EW10, EW16
WMU 6C	OW9. EW10, EW16
WMU 6D	OW9. EW10, EW16
WMU G	OW18, SIMW4
WMU H	OW23, SIMW4

7. Compliance Period

The compliance period for each waste management unit shall be the number of years equal to the active life of the unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water

quality monitoring program subsequent to a release from the waste management unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program [Title 27, section 20410].

8. Monitoring Points

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

D. TRANSMITTAL LETTER FOR ALL REPORTS

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

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

ORIGINAL SIGNED BY

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

6 December 2016
(Date)

AAH/WMH

TABLE I

GROUNDWATER DETECTION MONITORING PROGRAM

Parameter	Units	Sampling Frequency	Reporting Frequency
Field Parameters			
Groundwater Elevation	Ft. & 100ths, M.S.L.	Quarterly	Semiannual
Temperature	^{o}F	Semiannual	Semiannual
Electrical Conductivity	umhos/cm	Semiannual	Semiannual
pH	pH units	Semiannual	Semiannual
Turbidity	Turbidity units	Semiannual	Semiannual
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L[1]	Semiannual	Semiannual
Chloride	mg/L	Semiannual	Semiannual
Carbonate	mg/L	Semiannual	Semiannual
Bicarbonate	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual	Semiannual
Sulfate	mg/L	Semiannual	Semiannual
Calcium	mg/L	Semiannual	Semiannual
Magnesium	mg/L	Semiannual	Semiannual
Potassium	mg/L	Semiannual	Semiannual
Sodium	mg/L	Semiannual	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L[2]	Semiannual	Semiannual
Inorganics (dissolved)[3]	ug/L	Annually	Annually
5-Year Constituents of Concern (see Table VI)			
Total Organic Carbon	mg/L	5 years	2020
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	'' ''

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1 Milligrams per liter
2 Micrograms per liter
3 Monitoring to include the following parameters for Inorganics (dissolved): Cobalt, Copper, Iron, Manganese, Nickel, Vanadium, and Zinc.

TABLE II

UNSATURATED ZONE DETECTION MONITORING PROGRAM

SOIL PORE GAS[1]

Parameter	Units	Sampling Frequency	Reporting Frequency
Monitoring Parameters			
Volatile Organic Compounds (USEPA Method TO-15)[2]	ug/cm	Annually[2]	Annually
Methane	% by volume	Semiannual	Semiannual
Carbon Dioxide	% by volume	Semiannual	Semiannual
Oxygen	% by volume	Semiannual	Semiannual
Remainder gas	% by volume	Semiannual	Semiannual

PAN LYSIMETERS[3] (or other vadose zone monitoring device)

Parameter	Units	Sampling Frequency	Reporting Frequency
Field Parameters			
Presence of liquid	yes/no	Monthly	Semiannual
Electrical Conductivity	umhos/cm	Monthly	Semiannual
pH	pH units	Monthly	Semiannual
Volume of liquid removed	gallons	Monthly	Semiannual
Flow Rate	gallons/day	Monthly	Semiannual
Monitoring Parameters			
Ammonia	mg/L	Semiannual	Semiannual
Total Kjeldahl Nitrogen	mg/L	Semiannual	Semiannual
Total Alkalinity	mg/L	Semiannual	Semiannual
Total Dissolved Solids (TDS)	mg/L	Semiannual	Semiannual
Chloride	mg/L	Semiannual	Semiannual
Carbonate	mg/L	Semiannual	Semiannual
Bicarbonate	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual	Semiannual
Sulfate	mg/L	Semiannual	Semiannual
Calcium	mg/L	Semiannual	Semiannual
Magnesium	mg/L	Semiannual	Semiannual
Potassium	mg/L	Semiannual	Semiannual
Sodium	mg/L	Semiannual	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L	Semiannual	Semiannual
Inorganics (dissolved)[4]	mg/L	Annually	Annually
5-Year Constituents of Concern (see Table VI)			
Total Organic Carbon	mg/L	5 years	2020
Inorganics (dissolved)	mg/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	‘’ ‘’

TABLE II (CONTINUED)

UNSATURATED ZONE DETECTION MONITORING PROGRAM

Parameter	Units	Sampling Frequency	Reporting Frequency
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**. Liquids above the invert elevation of the pipe that goes into the manhole in 6B-N-LYS and 6B-S-LYS shall be removed. 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] Cobalt, Copper, Iron, Manganese, Nickel, Vanadium, Zinc

TABLE III

LEACHATE MONITORING [1], SEEP MONITORING [2], AND LCRS TESTING [3]

Parameter	Units	Sampling Frequency	Reporting Frequency
Field Parameters			
Total Flow[5]	Gallons	Monthly	Semiannual
Flow Rate[5]	Gallons/Day	Monthly	Semiannual
Electrical Conductivity[5]	umhos/cm	Monthly	Semiannual
pH[5]	pH units	Monthly	Semiannual
Hydraulic Head[6]	feet	Monthly	Semiannual
Hydraulic Head[4]	feet	Continuously	Semiannual
Monitoring Parameters			
Ammonia	mg/L	Semiannual	Semiannual
Total Kjeldahl Nitrogen	mg/L	Semiannual	Semiannual
Total Alkalinity	mg/L	Semiannual	Semiannual
Total Dissolved Solids (TDS)	mg/L	Semiannual	Semiannual
Chloride	mg/L	Semiannual	Semiannual
Carbonate	mg/L	Semiannual	Semiannual
Bicarbonate	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual	Semiannual
Sulfate	mg/L	Semiannual	Semiannual
Calcium	mg/L	Semiannual	Semiannual
Magnesium	mg/L	Semiannual	Semiannual
Potassium	mg/L	Semiannual	Semiannual
Sodium	mg/L	Semiannual	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L	Annually	Annually
5-Year Constituents of Concern (see Table VI)			
Total Organic Carbon	mg/L	Annually	Annually
Inorganics (dissolved)	ug/L	Annually	Annually
Volatile Organic Compounds (USEPA Method 8260B, extended list)	ug/L	Annually	Annually
Semi-Volatile Organic Compounds (USEPA Method 8270C or D)	ug/L	Annually	Annually
Chlorophenoxy Herbicides (USEPA Method 8151A)	ug/L	Annually	Annually
Organophosphorus Compounds (USEPA Method 8141B)	ug/L	Annually	Annually
LCRS Testing [3]	---	Annually	Annually

[1] 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 shall then be sampled for all parameters and constituents in accordance with the frequencies listed in Table III whenever liquid is present.

TABLE III (CONTINUED)

LEACHATE MONITORING [1], SEEP MONITORING [2], AND LCRS TESTING [3]

[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. Also, refer to Section B.3

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

[4] Bioreactor landfill waste management units only.

[5] Field parameters from WMUs 1-5 are measured at LPS1. Field parameters from WMUs 6A-6C are measured at LPS2.

[6] WMUs 6D1, 6D2 and all future constructed cells.

TABLE IV

SURFACE WATER DETECTION MONITORING PROGRAM

Parameter	Units	Sampling Frequency[1]	Reporting Frequency
Field Parameters			
Electrical Conductivity	umhos/cm	Semiannual	Semiannual
pH	pH units	Semiannual	Semiannual
Turbidity	Turbidity units	Semiannual	Semiannual
Flow to Waters of U.S.	Yes or No	Semiannual	Semiannual
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L	Semiannual	Semiannual
Carbonate	mg/L	Semiannual	Semiannual
Bicarbonate	mg/L	Semiannual	Semiannual
Chloride	mg/L	Semiannual	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual	Semiannual
Sulfate	mg/L	Semiannual	Semiannual
Calcium	mg/L	Semiannual	Semiannual
Magnesium	mg/L	Semiannual	Semiannual
Potassium	mg/L	Semiannual	Semiannual
Sodium	mg/L	Semiannual	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, short list, see Table V)	ug/L	Semiannual	Semiannual
5-Year Constituents of Concern (see Table VI)			
Total Organic Carbon	mg/L	5 years	2020
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 DETECTION MONITORING

Surrogates for Metallic Constituents:

pH
Total Dissolved Solids
Electrical Conductivity
Chloride
Sulfate
Nitrate nitrogen

Volatile Organic Compounds, short list:

USEPA Method 8260B

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

TABLE V

MONITORING PARAMETERS FOR DETECTION MONITORING

Continued

Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl ethyl ketone (MEK: 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
4-Methyl-2-pentanone (Methyl isobutylketone)
Naphthalene
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1.2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride
Xylenes

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

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

Volatile Organic Compounds, extended list:

USEPA Method 8260B

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

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

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

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

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

Semi-Volatile Organic Compounds:

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

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

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

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

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

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

TABLE VI

5-YEAR COCs & APPROVED USEPA ANALYTICAL METHODS

Continued

Chlorophenoxy Herbicides:

USEPA Method 8151A
2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Organophosphorus Compounds:

USEPA Method 8141B
Atrazine
Chlorpyrifos
0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)
Diazinon
Dimethoate
Disulfoton
Methyl parathion (Parathion methyl)
Parathion
Phorate
Simazine

TABLE VII

BIOSOLIDS/ANAEROBIC DIGESTATE MONITORING PROGRAM

Parameter	Units	Sampling Frequency[1]	Reporting Frequency
Monitoring Parameters			
Arsenic	mg/kg	Annual	Annual
Cadmium	mg/kg	Annual	Annual
Copper	mg/kg	Annual	Annual
Lead	mg/kg	Annual	Annual
Mercury	mg/kg	Annual	Annual
Molybdenum	mg/kg	Annual	Annual
Nickel	mg/kg	Annual	Annual
Selenium	mg/kg	Annual	Annual
Zinc	mg/kg	Annual	Annual

[1] Annual sampling shall be conducted on Biosolids/Anaerobic Digestate from each Generator. Samples shall be collected more frequently for analysis if the Generator's Biosolids/Anaerobic Digestate changes.

TABLE VIII

LANDFILL GAS CORRECTIVE ACTION MONITORING PROGRAM

Parameter	Units	Sampling Frequency	Reporting Frequency
LFG Control System			
Control System Run-time	Hours	Monthly	Annual
Control System Down-time	%	Monthly	Annual
Temperature into Plant	^{0}F	Monthly	Annual
Flare Combustion Temperature	^{0}F	Monthly	Annual
System Vacuum	mm Hg vacuum	Monthly	Annual
Totalized flow into Plant	Cubic Feet	Monthly	Annual
Totalized flow rate into Plant	CFM	Monthly	Annual
LFG Control System Influent			
Volatile Organic Compounds (USEPA TO-15)	ug/cm	Every 5 years	2019 and every 5 years thereafter
Methane	%	Monthly	Annual
LFG Extraction Wells[2]			
Atmospheric Temperature	^{0}F	Monthly	Annual
Atmospheric Pressure	inches Hg	Monthly	Annual
Methane	% by volume	Monthly	Annual
Carbon Dioxide	% by volume	Monthly	Annual
Oxygen	% by volume	Monthly	Annual
Remainder gas	% by volume	Monthly	Annual
Gas temperature at each well	^{0}F	Monthly	Annual
Initial static pressure in wellhead	inches H20	Monthly	Annual
Adjusted static pressure in Wellhead	inches H20	Monthly	Annual
LFG Probes[3]			
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

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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 (CONTINUED)

LANDFILL GAS CORRECTIVE ACTION MONITORING PROGRAM

2. The extraction well monitoring requirement is limited to those extraction wells associated with waste management units in Corrective Action. Currently, the WMUs in corrective action include WMUs 1,2,3,4,5,6B,6C.
3. The LFG Probe monitoring requirement is limited to those probes associated with waste management units in Corrective Action. Currently, the WMUs in corrective action include WMUs 1,2,3,4,5,6B,6C.

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FINDINGS

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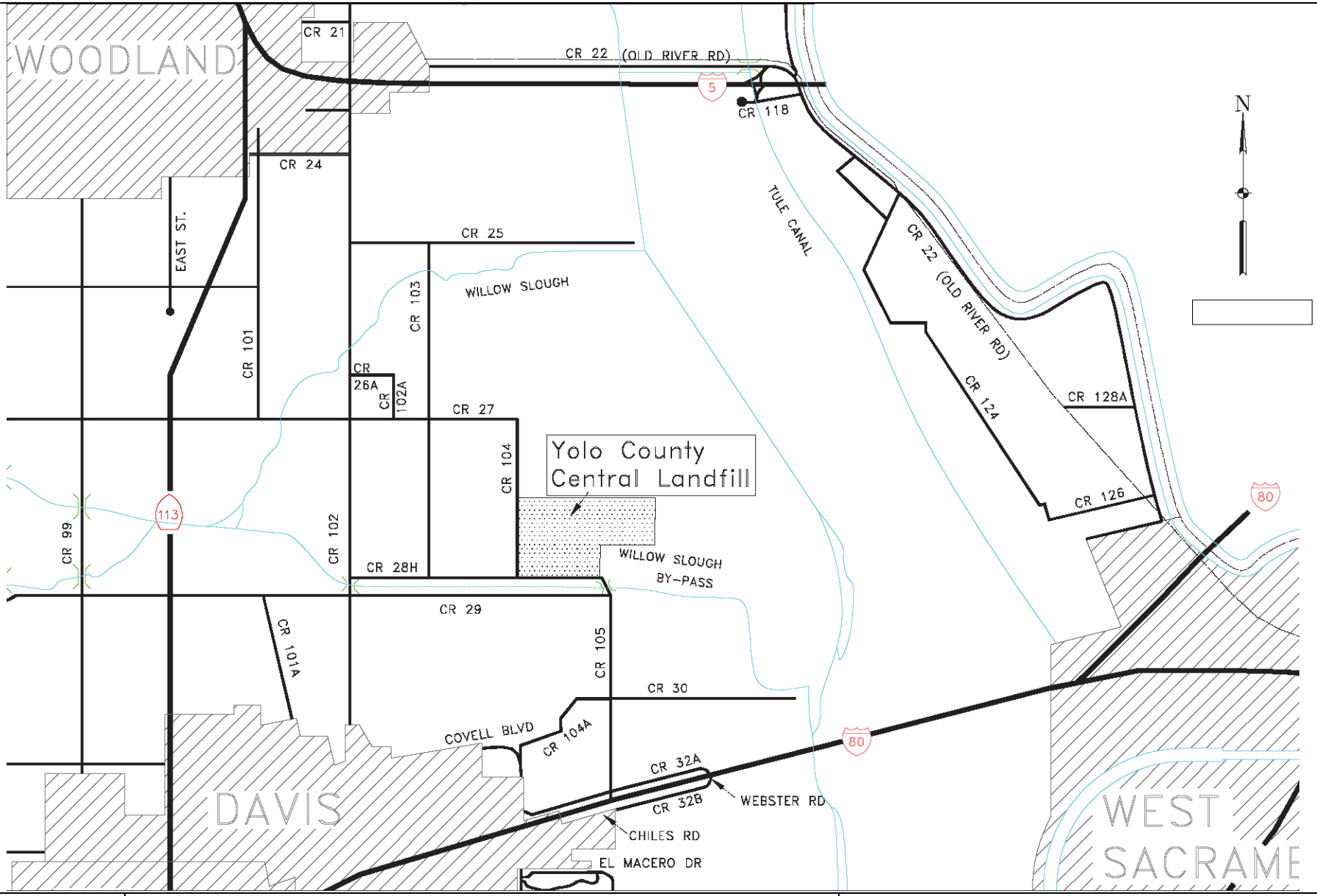
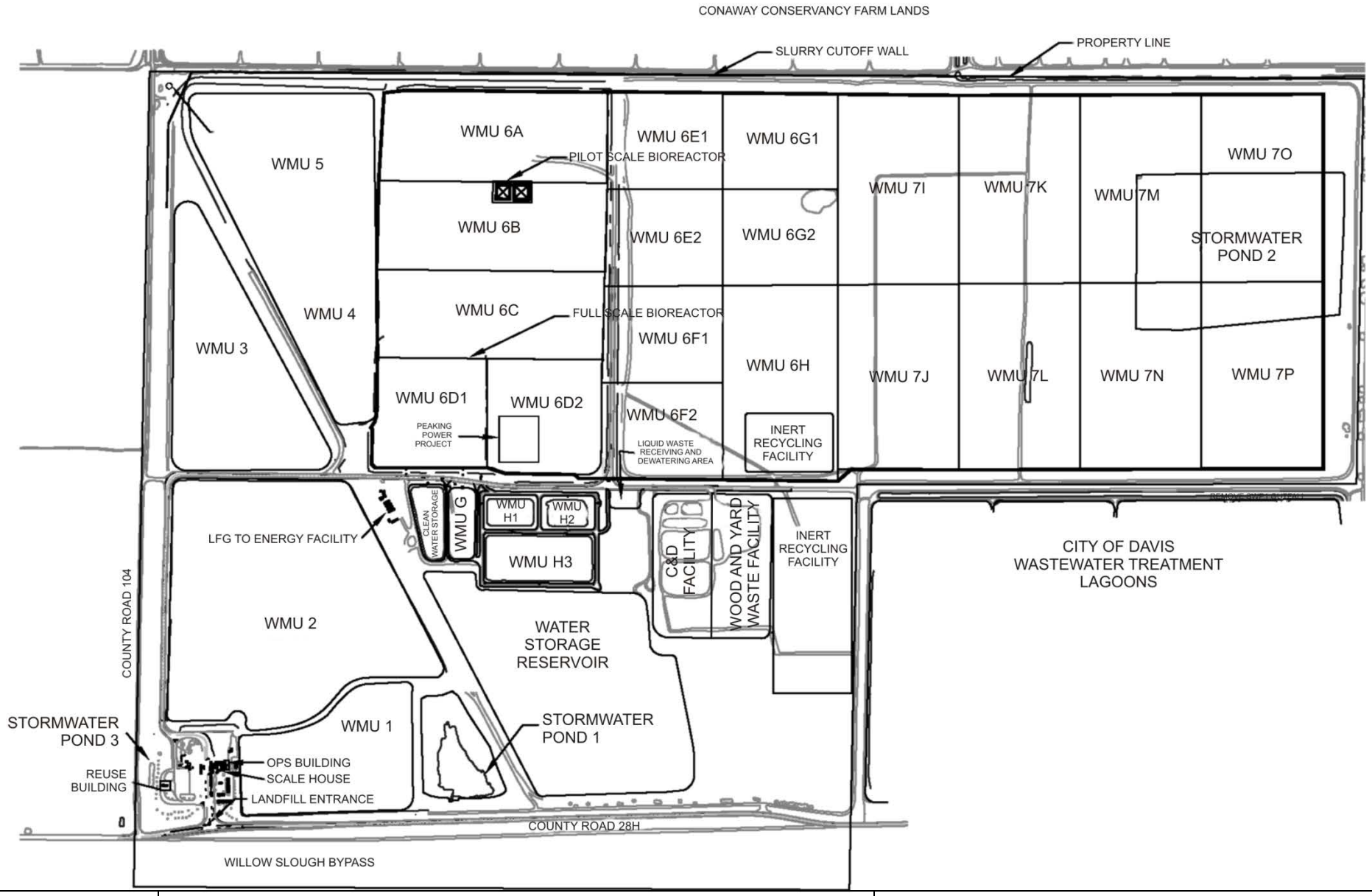
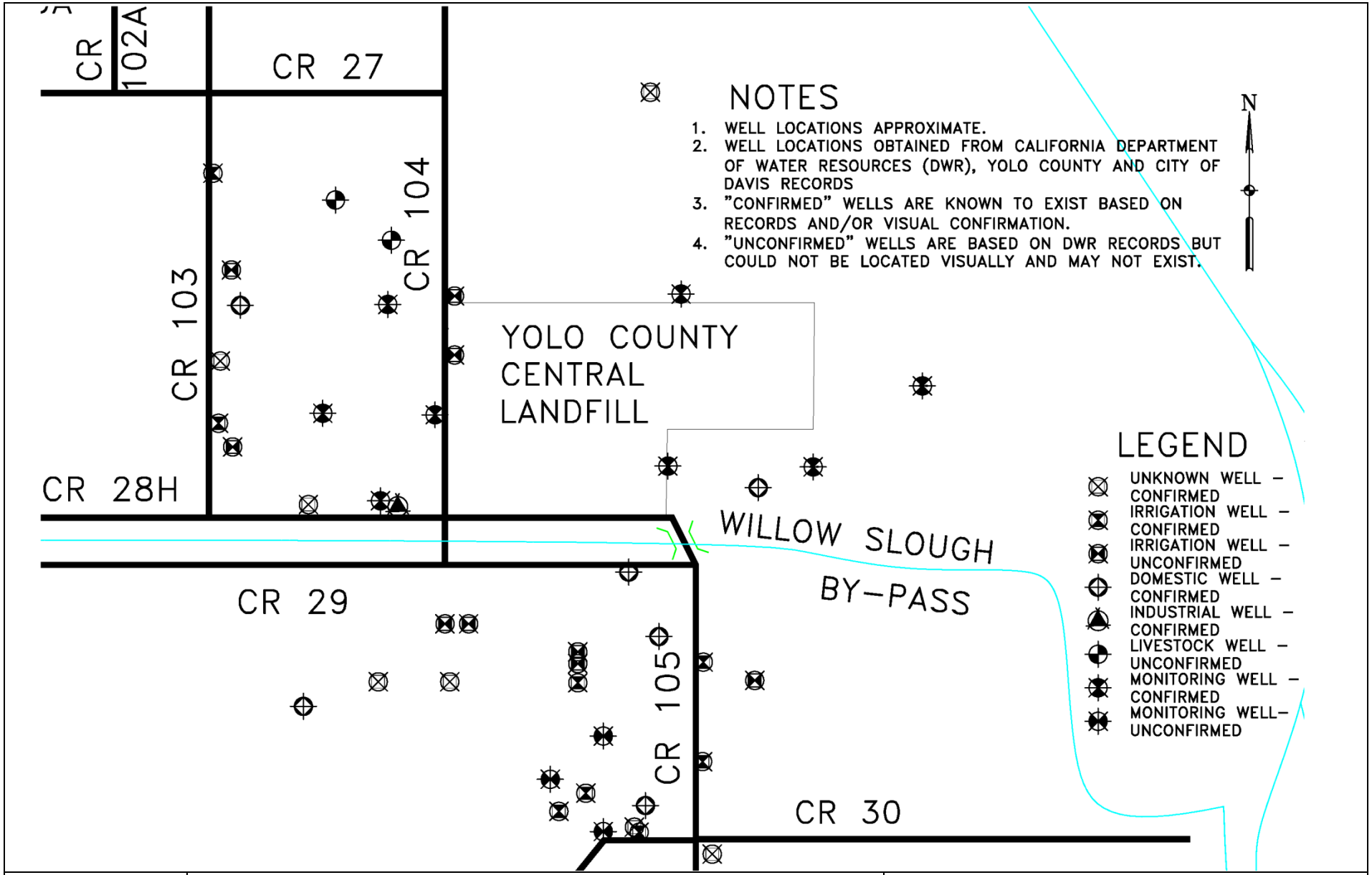
HEREBY ORDERED



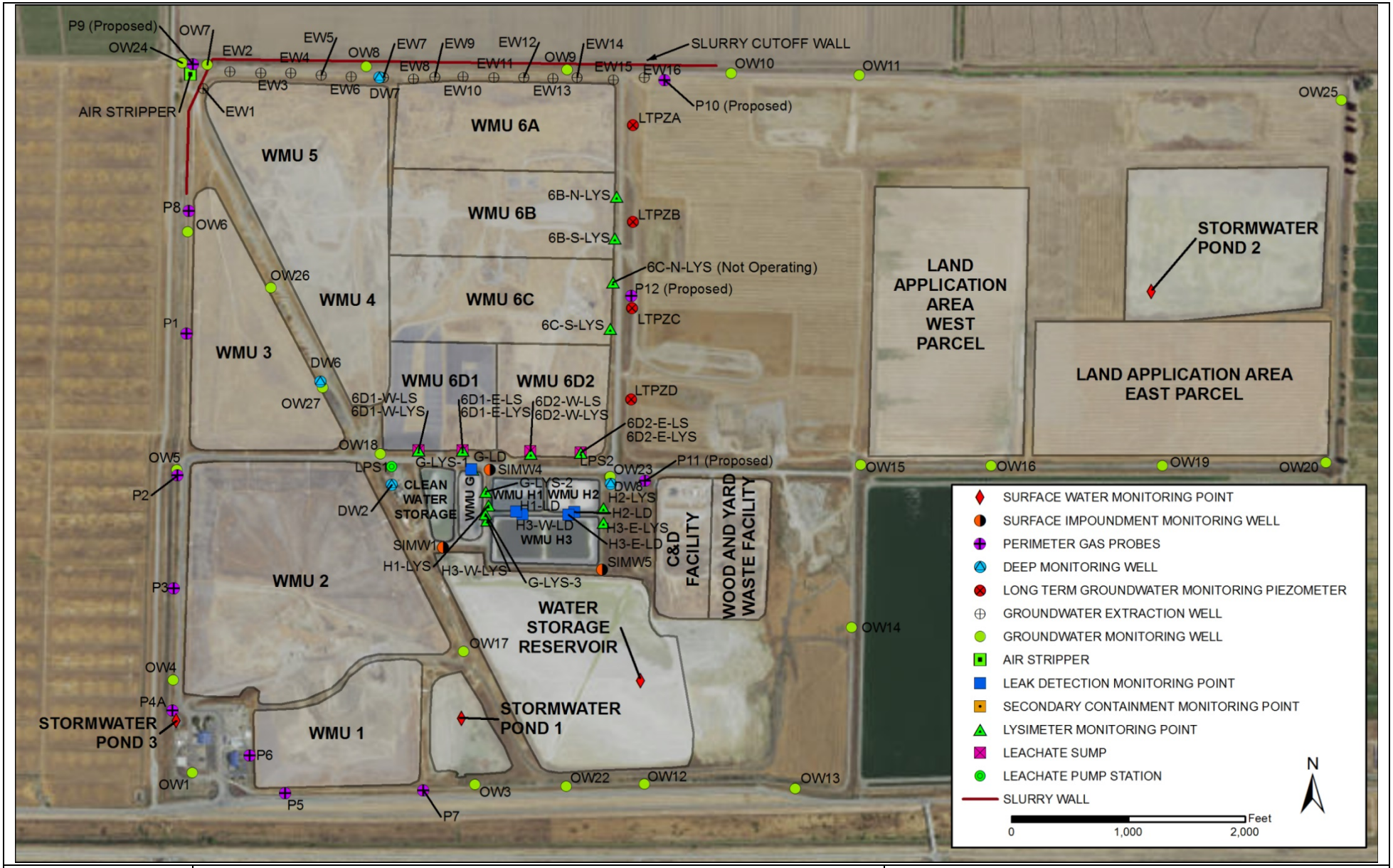
Approximate Scale	Drawing Reference: Yolo County Planning, Public Works and Environmental Services Yolo County Central Landfill Joint Technical Document Fig. 1 Location Map	**SITE LOCATION MAP** County of Yolo, Planning and Public Works Department Yolo County Central Landfill Yolo County



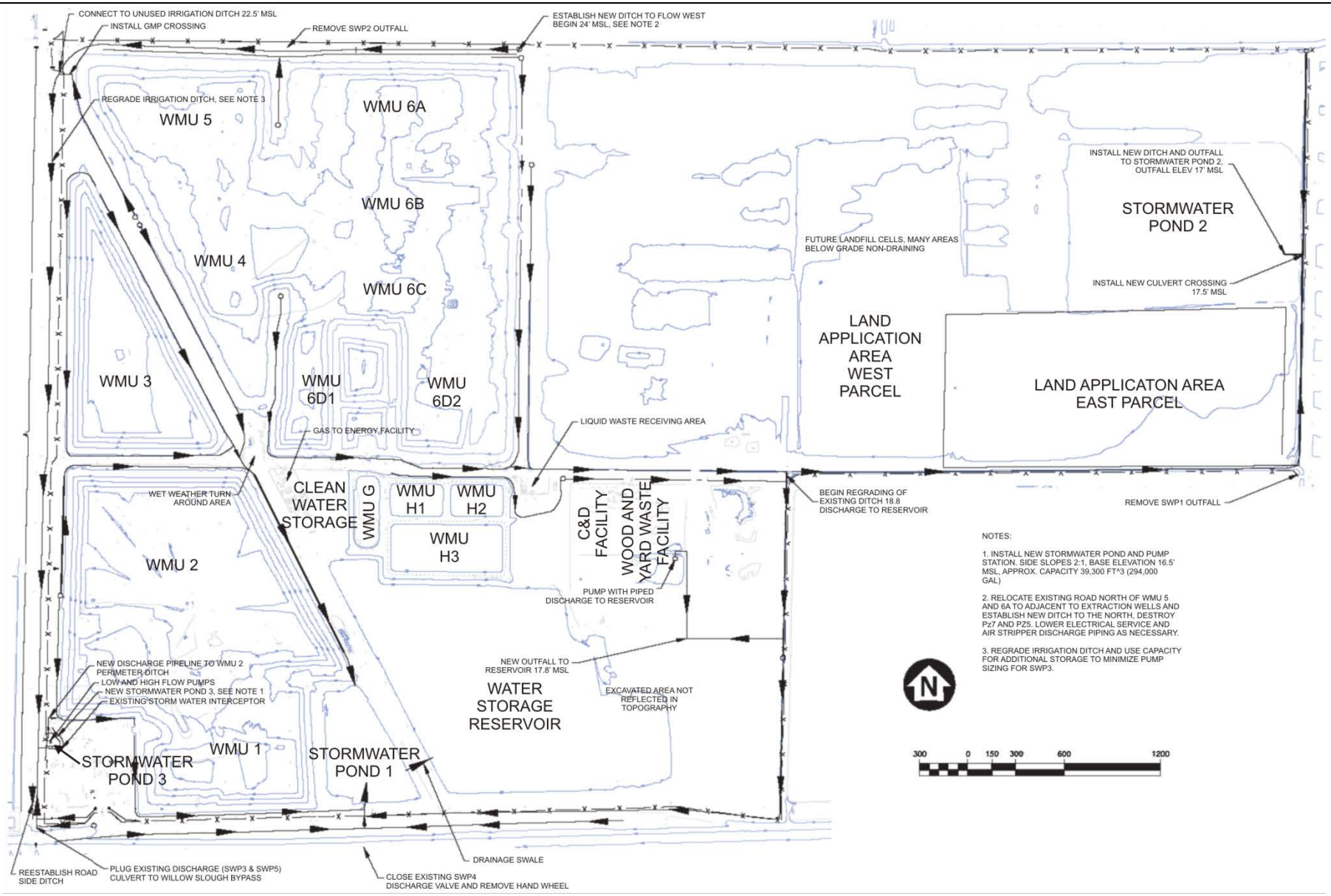
Approximate Scale	Drawing Reference: Yolo County Planning, Public Works and Environmental Services Yolo County Central Landfill Joint Technical Document Fig. 2 Site Plan	**SITE PLAN MAP** County of Yolo, Planning and Public Works Department Yolo County Central Landfill Yolo County



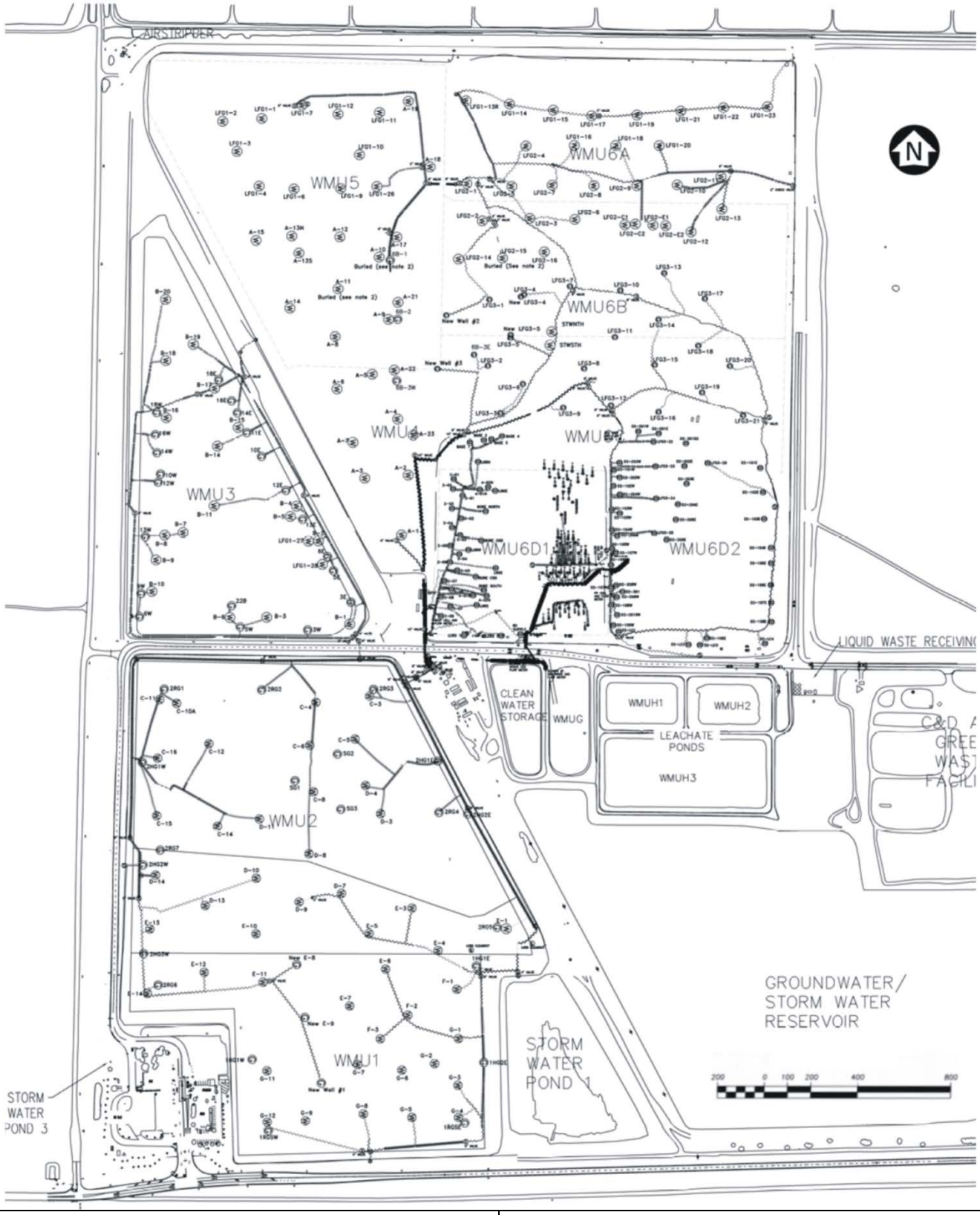
Approximate Scale 1"=3,100 feet	Drawing Reference: Yolo County Planning, Public Works and Environmental Services Yolo County Central Landfill Joint Technical Document Fig. 20 Surrounding Wells	**SURROUNDING WELL LOCATION MAP** County of Yolo, Planning and Public Works Department Yolo County Central Landfill Yolo County



Approximate Scale	Drawing Reference: Yolo County Planning, Public Works and Environmental Services Yolo County Central Landfill Joint Technical Document Fig. 7 Monitoring Point Locations	**MONITORING LOCATION MAP** County of Yolo, Planning and Public Works Department Yolo County Central Landfill Yolo County



Approximate Scale	Drawing Reference: Yolo County Planning, Public Works and Environmental Services Yolo County Central Landfill Joint Technical Document Figure 8: Site Storm Water Drainage	**SURFACE WATER DRAINAGE MAP** County of Yolo, Planning and Public Works Department Yolo County Central Landfill Yolo County



Drawing Reference:
Yolo County Planning, Public Works and Environmental Services
Yolo County Central Landfill
Joint Technical Document
Fig. 11 Existing LFG Collection System

LANDFILL GAS COLLECTION SYSTEM
County of Yolo, Planning and Public Works Department
Yolo County Central Landfill
Yolo County

INFORMATION SHEET

ORDER R5-2016-0094
COUNTY OF YOLO
DEPARTMENT OF COMMUNITY SERVICES
YOLO COUNTY CENTRAL LANDFILL

COUNTY OF YOLO, DEPARTMENT OF COMMUNITY SERVICES, YOLO CENTRAL LANDFILL, YOLO COUNTY

The County of Yolo, Department of Community Services, (hereinafter Discharger) owns and operates the Yolo County Central Landfill, a Class III municipal solid waste (MSW) disposal facility with Class II surface impoundments. The existing and future landfill area is approximately 474 acres of which approximately 208 acres have been constructed. Class III landfill Waste Management Units (WMUs) 1 thorough 5 cover approximately 123.5 acres and include unlined WMUs 1 through 4 and clay-lined WMU 5. WMUs 1 and 2 were brought to final grade and closed in 2012 and 2015. WMU 3 was closed in 2007. WMUs 4 and 5 are currently still accepting waste to reach final grade for closure. Class III landfill WMUs 6 and 7 will cover an area of approximately 349.5 acres and currently consist of composite-lined Modules 6A through 6D covering approximately 84 acres within WMU 6. Future landfill modules will consist of WMUs 6E through 6H and WMUs 7I through 7P which will also have composite liners.

The Class II surface impoundments are WMUs G and H. WMU H, completed in 1999, consists of three hydraulically connected ponds, (H1, H2, and H3. H3, the large pond, covers five-acres and has a capacity of 10.7 million gallons. H1 and H2 each cover 2.5 acres each and have a capacity of 3.4 million gallons each. All three surface impoundments at WMU H are hydraulically connected by overflow weirs and piping to form one WMU.

Other on-site facilities at the Yolo County Central Landfill include: an active landfill gas extraction system, a landfill gas-to-energy plant, a landfill gas flare, a materials recovery facility, a groundwater extraction and treatment system, a green waste processing facility, a concrete and asphalt debris facility, a metal recovery facility, Construction and Demolition Processing and Transfer Facility (C&D), a food waste receiving and processing area on top of a composite lined landfill unit, and a household hazardous waste drop-off facility.

On 17 February 2016, the Discharger submitted an amended Report of Waste Discharge (ROWD) as part of the Joint Technical Document (JTD) for the landfill. The information in the ROWD/JTD has been used in updating these WDRs. The ROWD contains the applicable information required in Title 27. The ROWD/JTD and supporting documents contain information related to this update of the WDRs including:

a. Developing an engineered alternative design for maintaining groundwater separation for future landfill modules WMUs 6E through 6H and WMUs 7I through 7P.

b. Adding a compost receiving, processing and storage area at the C&D facility.

c. Establishing anaerobic compost cells on composite lined landfill modules.

d. Covering WMU H2 with a geosynthetic liner to create an anaerobic liquid digester and collect methane gas under the cover for power generation.

AAH/WMH

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

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A. APPLICABILITY

1. These Standard Provisions and Reporting Requirements (SPRRs) are applicable to nonhazardous solid waste disposal sites that are regulated by the Central Valley Regional Water Quality Control Board (hereafter, Central Valley Water Board) pursuant to the provisions of California Code of Regulations, title 27 ("Title 27"), section 20005 et seq., and municipal solid waste (MSW) landfills that are subject to the Federal Subtitle D regulations contained in 40 Code of Federal Regulations section 258 (hereafter, "Subtitle D" or "40 C.F.R. § 258.XX") in accordance with State Water Resources Control Board (State Water Board) Resolution 93-62. The Subtitle D regulations are only applicable to MSW landfills and therefore any requirements in these SPRRs that are referenced as coming from Subtitle D are not applicable to non-MSW waste management units such as Class II surface impoundments, Class II waste piles, and non-MSW landfill units. All Subtitle D requirements in these SPRRs are referenced with "[40 C.F.R. § 258.XX]" after the requirement.

2. "Order," as used throughout this document, means the Waste Discharge Requirements (WDRs) to which these SPRRs are incorporated.

3. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, and do not protect the Discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.

4. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.

5. If there is any conflicting or contradictory language between the WDRs, the Monitoring and Reporting Program (MRP), or the SPRRs, then language in the WDRs shall govern over either the MRP or the SPRRs, and language in the MRP shall govern over the SPRRs.

6. If there is a site-specific need to change a requirement in these SPRRs for a particular landfill facility, the altered requirement shall be placed in the appropriate section of the WDRs and will supersede the corresponding SPRRs requirement. These SPRRs are standard and cannot be changed as part of the permit writing process or in response to comments, but they will be periodically updated on an as-needed basis.

7. Unless otherwise stated, all terms are as defined in Water Code section 13050 and in Title 27, section 20164.

B. TERMS AND CONDITIONS

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

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

2. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to [Wat. Code, § 13381]:

   a. Violation of any term or condition contained in this Order;

   b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;

   c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge; or

   d. A material change in the character, location, or volume of discharge.

3. Before initiating a new discharge or making a material change in the character, location, or volume of an existing discharge, the Discharger shall file a new report of waste discharge (ROWD), or other appropriate joint technical document (JTD), with the Central Valley Water Board [Wat. Code, § 13260(c) and § 13264(a)]. A material change includes, but is not limited to, the following:

   a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements;

   b. A significant change in disposal method, location, or volume (e.g., change from land disposal to land treatment);

   c. A change in the type of waste being accepted for disposal; or

   d. A change to previously-approved liner systems or final cover systems that would eliminate components or reduce the engineering properties of components.

4. Representatives of the Central Valley Water Board may inspect the facilities to ascertain compliance with the waste discharge requirements. The inspection shall be made with the consent of the owner or possessor of the facilities or, if the consent is refused, with a duly issued warrant. However, in the event of an emergency affecting the public health or safety, an inspection may be made without consent or the issuance of a warrant [Wat. Code, §13267(c)].

5. The Central Valley Water Board will review this Order periodically and will revise these waste discharge requirements when necessary [Wat. Code, § 13263(e) and Title 27, § 21720(b)].

6. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Central Valley Water Board [Wat. Code, § 13267(b)]. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.

7. A discharge of waste into the waters of the state is a privilege, not a right. No discharge of waste into waters of the state, whether or not the discharge is made pursuant to waste discharge requirements, shall create a vested right to continue the discharge [Wat. Code, § 13263(g)].

8. Technical and monitoring reports specified in this Order are requested pursuant to the Water Code [§13267(b)]. Failure to furnish the reports by the specified deadlines or falsifying information in the reports, are misdemeanors that may be liable civilly in accordance with §13268(b) of the Water Code [Wat. Code, §13268(a)].

C. STANDARD PROHIBITIONS

1. The discharge of liquid or semi-solid waste (waste containing less than 50 percent solids) is prohibited, except for the following when proposed in the ROWD/JTD and approved by this Order:

    a. Dewatered sewage or water treatment sludge as described in Title 27, section 20220(c) provided it is discharged above a composite liner with a leachate collection and removal system (LCRS) [Title 27, § 20200(d)(3)].

    b. Leachate and/or landfill gas condensate that is returned to the composite-lined waste management unit (with an LCRS) from which it came [Title 27, § 20340(g) and 40 C.F.R. § 258.28].

2. The discharge of wastes which have the potential to reduce or impair the integrity of containment structures or which, if commingled with other wastes in the waste management unit, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products, which, in turn:

    a. require a higher level of containment than provided by the unit; or

    b. are ‘restricted wastes’; or

    c. impair the integrity of containment structures;

    is prohibited [Title 27, § 20200(b)].

3. The discharge of wastes outside of a waste management unit or portions of a unit specifically designed for their containment is prohibited.

4. The discharge of solid waste containing free liquid or which may contain liquid in excess of the moisture holding capacity as a result of waste management operations, compaction or settlement is prohibited.

5. The discharge of waste to a closed landfill unit is prohibited.

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

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

D. STANDARD DISCHARGE SPECIFICATIONS

1. The Discharger is responsible for accurate characterization of wastes, including a determination of whether or not wastes will be compatible with containment features and other wastes at the waste management unit and whether or not the wastes are required to be managed as a hazardous waste [Title 27, § 20200(c)] or designated waste [Title 27, § 20210].

2. Leachate and landfill gas condensate collected from a waste management unit shall be discharged to the unit from which it came, or discharged to an appropriate waste management unit in accordance with Title 27 and in a manner consistent with the waste classification of the liquid [Title 27, § 20200(d) and § 20340(g)].

3. The discharge of leachate or landfill gas condensate is restricted to those portions of a waste management unit that has a composite liner system and LCRS meeting the Federal Subtitle D requirements [40 C.F.R. § 258.28].

4. Leachate and condensate returned to a composite-lined landfill unit (when approved by this Order) shall be discharged and managed such that it does not cause instability of the waste, does not cause leachate seeps, does not generate additional landfill gas that is not extracted from the landfill by an active landfill gas extraction system, does not cause contaminants to enter surface water runoff, and does not cause leachate volumes to exceed the maximum capacity of the LCRS.

5. Any discharge of waste outside the portion of the landfill that was already covered with waste as of the landfill unit's respective Federal Deadline constitutes a "lateral expansion" and requires the installation of an approved composite liner system and LCRS [40 C.F.R. § 258.40(b)].

6. Wastes shall be discharged only into waste management units specifically designed for their containment and/or treatment, as described in this Order.

7. The discharge shall remain within the designated disposal area at all times.

8. The discharge of waste shall not cause a nuisance condition [Wat. Code, § 13050(m)].

E. STANDARD FACILITY SPECIFICATIONS

1. All waste management units shall be designed, constructed, and operated to ensure that wastes, including leachate, will be a minimum of 5 feet above the highest anticipated elevation of underlying groundwater [Title 27, § 20240(c)], including the capillary fringe.

2. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].

3. Interim cover is daily and intermediate cover [Title 27, § 20750(a)]. Interim cover over wastes discharged to a landfill shall be designed and constructed to minimize percolation of liquids through the wastes [Title 27, § 20705(b)].

4. Intermediate cover consisting of compacted earthen material of at least twelve (12) inches shall be placed on all surfaces of the fill where no additional solid waste will be deposited within **180 days** [Title 27, § 20700(a)].

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

6. The Discharger shall **immediately** notify the Central Valley Water Board staff of any slope failure occurring at a waste management unit. Any failure which threatens the integrity of containment features or the waste management unit shall be promptly corrected in accordance with an approved method [Title 27, § 21710(c)(2)].

7. The Discharger shall **immediately** notify Central Valley Water Board staff of any flooding, unpermitted discharge of waste off-site or outside of waste management units, equipment failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.

8. The Discharger shall limit water used for facility maintenance within landfill areas to the minimum amount necessary for dust control and construction.

9. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

10. The Discharger shall lock all groundwater monitoring wells with a lock on the well cap or monitoring well box. All monitoring devices shall be clearly labeled with their designation including all monitoring wells, LCRS risers, and lysimeter risers and shall be easily accessible for required monitoring by authorized personnel. Each monitoring device shall be clearly visible and be protected from damage by equipment or vehicles.

11. The Discharger shall ensure that methane and other landfill gases are adequately vented, removed from landfill units, or otherwise controlled to prevent the danger of adverse health effects, nuisance conditions, degradation, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.

12. The Discharger shall maintain the depth of the fluid in the sump of each landfill unit at the minimum needed for efficient pump operation (the depth at which the pump turns on given the pump intake height and maximum pump cycle frequency).

13. The depth of fluid on the landfill liner shall not exceed **30 centimeters** (cm) [40 C.F.R. § 258.40(a)(2)]. This regulation is interpreted by the Central Valley Water Board to exclude the leachate sump. The Discharger shall **immediately** notify the Central Valley Water Board staff by telephone, and follow up in writing within **seven** days if monitoring reveals that the depth of fluid on any portion of the liner (excluding the sump) exceeds 30 cm (approximately 12 inches). The written notification shall include a timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.

14. Each LCRS shall be tested at least annually to demonstrate proper operation. The results of the tests shall be compared with earlier tests made under comparable conditions [Title 27, § 20340(d)].

15. The Discharger shall maintain a *Storm Water Pollution Prevention Plan* and *Monitoring Program and Reporting Requirements* in accordance with State Water Board Order No. 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)].