

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2015-0089-01

WASTE DISCHARGE REQUIREMENTS
FOR
SHASTA COUNTY AND THE CITY OF REDDING

FOR OPERATION AND CORRECTIVE ACTION
WEST CENTRAL CLASS III MUNICIPAL SOLID WASTE LANDFILL
AND CLASS II SURFACE IMPOUNDMENTS
SHASTA COUNTY

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

1. Shasta County owns the West Central Class III Municipal Solid Waste Landfill (West Central Landfill). In 1990, the City of Redding became the landfill operator by means of an Agreement executed between the City and the County. Prior to 1990, the landfill was operated by a private contractor. Shasta County and the City of Redding hereinafter are collectively referred to as Discharger. The Agreement between Shasta County and the City of Redding describes each agency's role and the financing and budgetary structure for landfill operations. In summary, Shasta County is responsible for planning and engineering, environmental monitoring and reporting, and administration (including accounting) related to facility expansion, installation of new or replacement of infrastructure, and major repairs of existing facilities. The City of Redding is responsible for day-to-day operations in accordance with all applicable regulations and permits and for administration and accounting related to landfill operations. Per the Agreement, the City of Redding is required to consult with Shasta County on all issues regarding landfill operations. If a difference exists that cannot be resolved by consultation, then the matter is referred to the Solid Waste Committee for resolution. The Solid Waste Committee is comprised of the County Executive Officer, the City Manager, and a member at-large that has historically been the City Manager from either the City of Anderson or the City of Shasta Lake.
2. West Central Landfill (facility) is located near the community of Igo in western Shasta County, about 12 miles southwest of Redding, at 14095 Clear Creek Road. The facility is located in Sections 2, 3, and 4 of Township 30 and Sections 34 and 35 of Township 31N, both in Range 6W of the Mount Diablo Base and Meridian, as shown in Attachment A, which is incorporated herein and made part of this Order by reference. The site latitude and longitude are 40°29' N and 122°32' W. Originally, the facility was comprised of Assessor Parcel Numbers (APN) 041-660-005, 041-660-015, 041-660-006, 041-660-014, 041-350-024, 041-350-059, 045-020-001, 045-020-002, 205-420-003, and 205-420-010. In 1998, APN 045-020-017 was added to the landfill property as part of the nearby Veteran's Cemetery development, making the total landfill area 1,090

acres. This parcel and its acreage were inadvertently omitted from previous Waste Discharge Requirements Order No. R5-2005-0068, which described a total area of 1,058 acres. In 2013, Shasta County acquired APNs 045-020-010 (145 acres) and 045-020-011 (15 acres) from the Bureau of Land Management on the west side of the landfill for buffer space and to expand the landfill gas monitoring system. These two parcels added 160 acres to the facility making the total landfill area 1,250 acres.

3. West Central Landfill 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 (a.k.a. Subtitle D) in accordance with State Water Resources Control Board (State Water Board) Resolution 93-62. The landfill serves the western portion of Shasta County, including the communities of Redding, Anderson, Shasta Lake, Cottonwood, and Palo Cedro.
4. West Central Landfill was sited and designed in 1981, and constructed in 1982. The landfill site includes four classified waste management units (Units): the 22-acre Phase 1 Unit which closed in 1992, the currently operating Phase 2 Unit which began operations in 1991, the covered 450,000 gallon (total capacity without freeboard) Class II surface impoundment (Unit 3), and the uncovered 2,100,000 gallon (total capacity without freeboard) Class II surface impoundment (Unit 4). The surface impoundments are used for storage and evaporation of leachate. The Phase 2 Unit is being constructed in sub-Units and will cover 100 acres at full build-out (see Findings 6, 7, 8, and 9 below). Presently, approximately 83 acres of the Phase 2 Unit has been constructed and contains waste. Associated facilities at the site include an in-fill gas collection and control system with flare, an unclassified unlined waste tire Unit that's no longer active and has a soil final cover in place, a clean wood diversion area, an inert material diversion area, two scales, a scale house, a public drop-off and recycling area, a shop building, four contact water impoundments, six storm water detention ponds, and two storm water retention ponds. A paved road exists from the front entrance, past the scale house and public drop-off area, leading to the shop building and around the north, west, and south perimeter of the Phase 2 Unit. These facilities are shown in Attachment B and Attachment C, which are incorporated herein and made part of this Order by reference.
5. The Phase 1 Unit contains approximately 900,000 cubic yards of waste. The base liner underlying the waste consists of five-feet of clayey soil in the bottom of a canyon. The Phase 1 Unit has a leachate collection and removal system (LCRS) located in the bottom of the Phase 1 Unit canyon alignment that's connected to the Leachate Wet Well. Finding 56 below describes the Phase 1 LCRS in more detail. Underlying the length of the Phase 1 Unit, at a depth of five feet below the base liner, is a six-inch perforated PVC pipe surrounded by drain rock and non-woven filter fabric that intercepts shallow groundwater. The Phase 1 Unit Underdrain previously discharged to a nearby storm water detention pond, but in 2013 (after the Clover Fire burned over the area), volatile organic compounds (VOCs) and other elevated water quality parameters were

detected in the discharge. In November 2014, the Phase 1 Underdrain Wet Well was constructed to capture the discharge from the Phase 1 Underdrain and pump it to the Leachate Wet Well and ultimately the Class II surface impoundment. A final cover system was constructed over the Phase 1 Unit in 1992. The final cover system consists of (in ascending order) a one-foot thick foundation layer of compacted base soils, six inches of compacted native clayey soils with a maximum permeability of 1×10^{-6} cm/sec, six inches of compacted soils amended with 4% bentonite, and a one-foot thick vegetated erosion resistant layer. Three sealed single ring permeability tests conducted on the bentonite amended barrier layer found permeabilities ranging from 2.19×10^{-7} cm/sec to 1.4×10^{-8} cm/sec.

6. The Phase 2 Unit is being developed in sub-Units and has an estimated total capacity of approximately 13,116,000 cubic yards (wastes and cover soil) with an estimated remaining site life of 17 years (through 2034). The landfill currently receives approximately 500 tons of waste per day. The life expectancy of the landfill may increase as recycling and other diversion programs reduce incoming wastes. The sub-Units are described in the table below:

Phase 2 Unit – sub-Unit Sequencing

sub-Unit	Year Constructed	Acres
2-1A	1990	7.9
2-1B	1992	7.2
2-1C	1994	6.1
2-2	1996	10.4
2-1D	1999	13.0
2-3	2003	9.5
2-4A	2006	14.1
2-4B	2010	4.5
2-4C	2016	10.8
2-5A	2021 ¹	8.6
2-5B	2024 ¹	7.9
	Total	100

¹ Tentative Construction Dates

7. Various base liner systems have been installed beneath the Phase 2 sub-Units. Phase 2–1A and Phase 2–1B, the first sub-Units constructed, have base liner systems consisting of (from bottom to top) a 12-inch clay layer with a maximum hydraulic conductivity of 1×10^{-6} cm/sec, and a six-mil PVC moisture barrier layer overlain by six inches of drain rock with perforated PVC piping for collection of leachate. Sub-Units 2–1C and 2–2 are constructed with (from bottom to top) 12 inches of compacted clay with bentonite added to achieve a maximum hydraulic conductivity of 1×10^{-7} cm/sec, a Geosynthetic Clay Liner (GCL), and a 40-mil PVC geomembrane, overlain by a 12-inch gravel drainage layer. Sub-Unit 2–1D has a base liner consisting of (from bottom to top) a 12-inch clay layer with bentonite additive to achieve a maximum hydraulic conductivity of 1×10^{-7} cm/sec, a GCL, a textured 60-mil high density polyethylene (HDPE) geomembrane, and a 12-inch gravel drainage layer. The Phase 2 sub-Units 2–3, 2-4A, 2-4B and 2-4C have base liner systems consisting of (from bottom to top) a 12 inch compacted clay layer, a GCL, a 60-mil HDPE geomembrane, a geotextile, and a two-foot gravel drainage layer. Side slopes are constructed at a 2:1 geometry with a GCL in contact with the prepared subgrade, overlain by a textured 60-mil HDPE geomembrane, and a geonet drainage layer overlain by a non-woven geotextile. A LCRS is installed above the Phase 2 base liner system and it drains by gravity to the Leachate Wet Well. Finding 57 below describes the Phase 2 LCRS in more detail.
8. The Phase 2 Unit is underlain by two underdrains designed to intercept high groundwater and maintain five feet of separation between the groundwater and overlying wastes. Like the Phase 1 Unit Underdrain, both of the Phase 2 Unit underdrains consist of perforated pipe/drain rock/filter fabric arrangements installed five feet below the overlying base liner systems. Both underdrains generally follow the original Phase 2 Unit canyon alignment. Prior to 2003, only the Unit 1–2 Underdrain existed. However, the detection in 2002 of VOCs and other elevated water quality parameters in its discharge prompted the collection and containment of the discharge to the LCRS. While the Unit 1-2 Underdrain was previously plumbed directly to the Leachate Main, that configuration was changed with the construction of sub-Unit 4C in 2016. Currently, there is no direct connection from the Underdrain to the LCRS, and accumulated liquid in the Underdrain is manually transferred to the LCRS once per month. Flow from the Unit 1-2 Underdrain is limited and sporadic. A new underdrain, the Unit 3–4 Underdrain, was installed during construction of sub-Unit Phase 2–3 and it continued below sub-Unit 2–4A in 2006 and sub-Unit 4C in 2016. The Unit 1–2 Underdrain serves below sub-Units 1A and 2 and the Unit 3–4 Underdrain serves below sub-Units 2-3, 2-4A and 2-4C. The Unit 3–4 Underdrain has had no recorded discharge since its installation. The Underdrain systems will continue down the Phase 2 canyon as future sub-Units are constructed.
9. Sub-Units 2–3, 2–4A and 2-4C are equipped with leak detection systems (LDSs). All of the sub-Unit LDSs are constructed with 20-foot wide double HDPE geomembrane-lined sections located along the downgradient (generally the eastern edge) toes of each sub-Unit. The interstitial space between the geomembranes is filled with six-inches of pea gravel and an accompanying four-inch perforated collection pipe that drain to monitoring

points located beyond the Phase 2 Unit's eastern boundary in the same general area as the Phase 2 Unit underdrains described in Finding 8 above. The October 2014 *Report of Waste Discharge* (ROWD) describes the reason for choosing to locate the LDSs at the downgradient toes of sub-Units 2-3 and 2-4A is because these areas are subject to higher accumulations of leachate and it's also the location of the Leachate Main Line penetration, which is the area considered most at risk for leaks. Since their installation, two of the LDSs have had discharges containing pollutants associated with waste disposal activities. In 2006, during construction of sub-Unit 2-4A, a discharge from the sub-Unit 2-3 LDS was found to contain VOCs and other elevated water quality parameters. In 2013, a discharge with similar properties was observed from the sub-Unit 2-4A LDS. The discharge from both the sub-Unit 2-3 and 2-4A LDSs is sporadic and minimal, so currently, the LDS is manually drained and conveyed to the Class II surface impoundments (Unit 3 and Unit 4) once per month.

10. The Class II surface impoundments (Units 3 and 4) used for storage and evaporation of leachate have different base liner systems. Unit 3 has a base liner system consisting of (from bottom to top) a two-foot thick clay layer with measured hydraulic conductivities in the mid to high 10^{-7} cm/sec range, a geotextile, a geonet drainage layer, a second geotextile, and an 80-mil HDPE geomembrane. Unit 3 also has a leak detection system (LDS) comprised of a two-inch diameter perforated PVC pipe within a sand-filled trench wrapped with geotextile located along the central north-south axis of the impoundment, below the HDPE geomembrane and above the two-foot clay layer. Unit 4 has a base liner system consisting of (from bottom to top) a one foot thick clay layer (floor only), a geosynthetic clay liner (GCL), a 60 mil secondary geomembrane, a geonet (LCRS/LDS), and a 60 mil primary geomembrane. The Unit 4 LDS is comprised of a two-inch diameter perforated PVC pipe within a pea gravel sump wrapped with geotextile, located at the southeast corner of the impoundment, below the HDPE geomembrane and above the GCL. Any liquid that enters the geonet drainage layer would enter the LDS, which is connected to a collection sump located just east of the south end of Unit 3, and at the eastern edge of Unit 4. To date, no discharge has been detected in the Class II surface impoundment LDS sumps.
11. A landfill gas collection and control system (GCCS) was installed in summer 2011. The initial GCCS consisted of 25 vertical extraction wells, with 19 extraction wells installed in the Phase 2 Unit and six extraction wells installed in the Phase 1 Unit. The GCCS is connected to a 1,500 cubic foot/minute flare for destruction of landfill gas. An additional 18 vertical extraction wells were installed in 2014 in the Phase 2 Unit. Of the 18 new extraction wells, eight were installed within the existing GCCS well field to address methane migration outside of the Unit and to reduce VOC impacts observed in upgradient groundwater monitoring wells. The other 10 extraction wells were installed east of the existing well field into previously uncontrolled portions of the Phase 2 Unit and more recently placed waste. Condensate from the GCCS is pumped to a holding tank for temporary storage prior to destruction within the flare. The Discharger has also considered connecting the Phase 2 Unit LCRS to the GCCS to provide additional control and collection opportunities, but the elevation of the Leachate Main Line between the

Unit and the Leachate Wet Well may need to be lowered to ensure proper functioning of both systems. Fourteen perimeter landfill gas monitoring probes are installed at approximately 1,000 foot intervals outside of the waste footprint.

12. On 10 November 2014, 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 revising these waste discharge requirements (WDRs). The ROWD contains the applicable information required in Title 27. The ROWD/JTD and supporting documents contain information related to this revision of the WDRs including a proposed schedule for completing partial final closure of the western half of the Phase 2 Unit as part of corrective action associated with groundwater impacts from landfill operations.
13. On 22 June 1990, the Central Valley Water Board issued Order No. 90-190 in which the landfill Unit in operation at the time was classified as a Class III Unit for the discharge of municipal solid waste (MSW). Additional Units have been constructed over time as landfill operations evolved, including the Phase 2 Unit which continues to receive MSW and the Class II surface impoundments (Unit 3) for the discharge of leachate. This Order continues to classify the landfill Units as Class III (Phase 2 Unit) and surface impoundments (Unit 3 and Unit 4) as Class II Units in accordance with Title 27.
14. 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.
15. This Order implements the applicable regulations for discharges of solid waste to land through Prohibitions, Specifications, Provisions, and monitoring and reporting requirements. Prohibitions, Specifications, and Provisions are listed in Sections A through H of these WDRs below, and in the Standard Provisions and Reporting Requirements (SPRRs) dated January 2012 which are part of this Order. Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) No. R5-2015-0089 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.

16. Title 27 contains regulatory standards for discharges of solid waste promulgated by the State Water Board and the California Department of Resources Recovery and Recycling (CalRecycle). In certain instances, this Order cites CalRecycle regulatory sections. Title 27, section 20012 allows the Central Valley Water Board to cite CalRecycle regulations from Title 27 where necessary to protect water quality provided it does not duplicate or conflict with actions taken by the Local Enforcement Agency in charge of implementing CalRecycle's regulations.

WASTE CLASSIFICATION AND UNIT CLASSIFICATION

17. The Discharger proposes to continue to discharge nonhazardous solid waste, including municipal solid waste, commercial solid waste, agricultural solid waste, non-hazardous industrial solid waste, construction and demolition waste, dewatered sewage and water treatment sludge, non-hazardous incinerator ash, non-friable asbestos, treated medical waste, animal carcasses, dewatered septage sludge, treated wood waste, and inert wastes to lined Class III landfill Units at the facility. Leachate will continue to be discharged to the Class II surface impoundments (Unit 3 and Unit 4). These classified wastes may be discharged only in accordance with Title 27, Resolution 93-62, and Subtitle D as required by this Order.
18. Active landfill sub-units in the Phase 2 Unit of the facility with pre-Subtitle D liner systems 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 "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.
19. The Discharger proposes to continue to discharge treated wood waste in the composite-lined units at the landfill. Title 22 defines "treated wood" to mean wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA - 7 U.S.C. Sec. 136 and following). This may include but is not limited to waste wood that has been treated with chromated copper arsenate (CCA), pentachlorophenol, creosote, acid copper chromate (ACC), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), or chromated zinc chloride (CZC).
20. Title 22, section 67386.11 allows treated wood waste to be discharged to a composite-lined portion of a MSW landfill that is regulated by WDRs issued pursuant to the Water Code provided that the landfill owner/operator:
 - a. Comply with the prohibitions in Title 22, section 67386.3, which are:

- i. Treated wood waste shall not be burned, scavenged, commingled with other waste prior to disposal, stored in contact with the ground, recycled with or without treatment (except as in iii, below), treated except in compliance with Title 22, section 67386.10, or disposed to land except in compliance with Title 22, section 67386.11.
 - ii. Any label or mark that identifies the wood waste as treated wood waste shall not be intentionally removed, defaced, or destroyed prior to disposal.
 - iii. Treated wood waste may be recycled only by reuse when all of the following apply:
 - (1) Reuse is on-site.
 - (2) Reuse is consistent with FIFRA approved use of the preservative.
 - (3) Prior to reuse, treated wood waste is handled in compliance with Title 22, division 4.5, chapter 34.
 - b. Ensure treated wood waste is managed at the landfill according to Title 22, division 4.5, chapter 34 prior to disposal.
 - c. Monitor the landfill for a release, and if a verified release is detected from the unit where treated wood is discharged, then the disposal of treated wood will be terminated at the unit with the verified release until corrective action ceases the release.
 - d. Handle treated wood waste in a manner consistent with the applicable sections of the California Occupational Safety and Health Act of 1973.
21. Since a verified release of waste is ongoing and impacting water quality in the vicinity of the landfill, these WDRs require the Discharger to cease accepting treated wood waste for disposal until such time that corrective actions result in cessation of the release, in accordance with California Health and Safety Code section 25150.7(d)(2)(C).
22. On two known occasions, the Discharger accepted wastes with constituents in excess of federal and/or state hazardous waste criteria:
- a. In 1991, West Central Landfill received prior approval from the Central Valley Water Board, the California Department of Toxic Substances Control, and the solid waste Local Enforcement Agency (LEA) before accepting approximately 4,500 tons of dried septage sludge from Shasta County's Redding Regional Septage Impoundments. The sludge had soluble lead (CAS 7439-92-1) concentrations in excess of the 5 mg/L Soluble Threshold Limit Concentration. It was believed that the elevated lead concentrations resulted from illegal disposal of commercial car wash waste at the septage facility.

- b. In 2011, West Central Landfill disposed of approximately 4,200 tons of shredder waste from a local automobile and appliance recycler in sub-Unit 2–4A. The shredder waste was not characterized for hazardous constituents prior to disposal. Post-disposal analysis of the buried waste, conducted in cooperation with Central Valley Water Board staff, found that the waste contained total concentrations of zinc (CAS 7440-66-6) in excess of the Total Threshold Limit Concentration and soluble concentrations of lead (CAS 7439-92-1), cadmium (CAS 7440-043-9), and zinc in excess of the respective Soluble Threshold Limit Concentrations. No variance was received from regulatory agencies prior to acceptance of this material for disposal. Further analysis performed on a stockpile of the shredder waste still on-site (which was not disposed at the landfill) found total concentrations of lead, chromium (CAS 7440-47-3), nickel (CAS 7440-01-0), and zinc in excess of the respective Total Threshold Limit Concentrations and soluble concentrations of cadmium, lead, and zinc in excess of the respective Soluble Threshold Limit Concentrations.
23. Title 27, section 20690 allows the use of alternative daily cover (ADC) at MSW landfills upon approval by the LEA and concurrence from CalRecycle. Title 27, section 20705 provides the Water Board's regulations for all daily and intermediate cover including that it shall minimize the percolation of liquids through waste and that the cover shall consist of materials that meet the landfill unit classification (Class II or Class III). The regulations also require that for non-composite lined portions of the landfill, 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 be listed in the water quality protection standard.
24. The Discharger uses the following materials for ADC:
 - a. Geosynthetic tarps are the most common form of ADC used at the landfill. West Central Landfill has the capability to deploy two 40-foot x 100-foot tarps using an automatic tarping machine attached to a dozer. Tarps are used in all weather conditions, and a 2009 approval from the LEA allows the use of tarps in excess of the 24-hour time frame prescribed in Title 27, section 20690(b)(1). The extended time use approval is for the period from close of operations at 4:30 p.m. on Saturday to the resumption of operations on Monday at 7:00 a.m.
 - b. Processed green waste is used as ADC, but less often than tarps. Use of green waste as ADC occurs only when there is excess material generated at the City of Redding's composting operation. This material is collected under the City's green waste collection program and is ground to a size of six-inches or smaller at the composting operation and then transported to the landfill for use as ADC. The processed green waste can only be used as ADC during dry weather. The processed green waste ADC is placed so that there are no gaps or voids in coverage and so that the final thickness is six to 12-inches.

- c. Wastewater treatment sludge is occasionally used as ADC, but only during dry weather conditions and after laboratory analysis of the material shows that the sludge is non-hazardous and non-designated waste. To use, the sludge must be sufficiently dry to form a compacted mass at least 12-inches thick.
25. The use of geosynthetic tarps for ADC as described in Finding 24(a) above is sufficient to minimize percolation of liquids through waste. The use of processed green waste and wastewater treatment sludge for ADC as described in Findings 24(b) and (c) above is limited to use during dry weather conditions only. No additional demonstration to show compliance with Title 27, section 20705 is necessary under these conditions. The use of these three ADCs is allowed as regulated by these WDRs.
 26. 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.

SITE DESCRIPTION

27. West Central Landfill is located near the western edge of the northern Sacramento Valley in a location where the land changes from relatively flat east of the landfill to hilly ground west of the landfill. Topography at the site ranges from 850 to 1,100 feet above mean sea level (MSL). The terrain consists primarily of broad, gently sloping, east-trending ridges separated by intermittent drainages that flow generally easterly toward Dry Creek, the closest receiving water to the Units located approximately 3,375 feet away. Native slopes range from less than five percent in the valley bottoms to as steep as 2-to-1 (horizontal to vertical) on the side slopes of hills. Several drainages on the landfill property transmit storm water easterly toward Dry Creek. A series of storm water detention ponds have been constructed in the drainage located directly east of the Phase 2 Unit and south of the older Phase 1 Unit. Several mapped springs exist within one mile of the landfill, about 4,000 feet to the northwest.
28. In general, land use within one mile of the facility is rural residential and agricultural. Specifically, land use to the north is zoned Unclassified (U), Limited Residential (L-R), Rural Residential (R-R), and Exclusive Agricultural-Agricultural Preserve (EA-AP), land use to the west is zoned Unclassified, Exclusive Agricultural-Agricultural Preserve, and Limited Residential (L-R), land use to the south is zoned Exclusive Agricultural-

Agricultural Preserve and Limited Agriculture (A-1), and land use to the east is zoned Unclassified, Limited Residential, Limited Agriculture, and Open Space (OS).

29. The landfill itself, the Veterans Cemetery to the west, and part of Cloverdale Road to the east of the landfill property are served by the Clear Creek Community Services District for water service. Areas to the north, west, and south of the landfill are generally served by individual water wells. The Discharger has identified 121 water wells within one mile of the landfill. Of these, 63 are identified as domestic water supply wells, one is a public water supply well, two are identified as irrigation wells, and one is identified as a test well. Usage of the other wells identified during the search is unknown.
30. West Central Landfill is located near the western edge of the Central Valley Geologic Province, near its contact with the Klamath Mountain Geologic Province. Geologic units mapped at the surface of the site and surrounding area include, from youngest to oldest, recent alluvium and dredge tailings, the Pleistocene-aged Red Bluff Formation, and the Pliocene-aged Tehama Formation. The Cretaceous-aged Chico Formation occurs at depth beneath the site, and outcrops within a mile west of the landfill. Older granitics, meta-volcanics (Copley greenstone), and meta-sediments outcrop in the Klamath Mountain Geologic Province northwest of the landfill.
31. The Chico Formation consists of well-consolidated to cemented, interbedded sandstone and shale. Overlying the Chico Formation is the Tehama Formation, which consists of fluvial deposits of clayey and silty sandstone with lenses of pebble and cobble conglomerates. The Tehama Formation comprises the sides and bottoms of canyons, and it's the principal water-bearing formation in the area. Overlying the Tehama Formation is the Red Bluff Formation, which consists of a thin veneer on the ridge tops in the vicinity of the landfill, and its similar in composition and depositional history to the Tehama Formation. The Red Bluff Formation is composed of poorly sorted gravel and cobble deposits in a reddish-brown sand and clay matrix.
32. In general, onsite soils consist of sandy clays and silts with gravel, and following the Unified Soil Classification System, these soils typically fall within either the ML, SM, SC, GM, or GC classifications. Soils in these classifications generally provide fair to good bearing capacity with undisturbed permeabilities ranging from 1×10^{-5} to 1×10^{-6} cm/sec. Onsite soils have been used, in both natural and bentonite amended states, to construct clay liners beneath Units, successfully achieving permeabilities of 1×10^{-7} cm/sec or less.
33. West Central Landfill is situated in the southwestern part of the Redding Groundwater Basin, a sub-basin of the Sacramento Valley Groundwater Basin. The geologic units found in the Redding Groundwater Basin include recent alluvium and dredge tailings at the surface, the Red Bluff Formation, the Tehama Formation, and at depth, the Chico Formation. The Chico Formation produces saline water in most areas of the Redding Groundwater Basin. The saline water is a relic of the marine environment in which the unit was deposited. The Red Bluff Formation and the Tehama Formation have similar

water-bearing characteristics, and for these WDRs, are treated as a single hydrogeologic unit, referred to as the Red Bluff-Tehama Group.

34. The stratigraphy and water-bearing characteristics of the Red Bluff-Tehama Group consists of permeable lenses that are separated from other permeable zones by lower permeability deposits. CH2M Hill reported the aquifer transmissivity and permeability of the Red Bluff-Tehama Group to be 95 to 337 gallons per day per foot, or 0.15 to 0.5 feet/day.
35. The closest significant fault to West Central Landfill is the Battle Creek Fault, a Quaternary-age, east-west trending normal fault located approximately 15 miles to the southeast. The last known major movement on this fault appears to have been over 400,000 years ago. The maximum credible earthquake (MCE) on the Battle Creek Fault is estimated to be a Richter magnitude of 6.0 to 6.5. This fault is not classified as active, but it is considered potentially active because it displaces rock younger than 1.6 million years old. The landfill is not located in or within 200 feet of a Holocene age fault or an Alquist-Priolo Earthquake Special Study Zone. The nearest Alquist-Priolo Earthquake Special Study Zone is the Hat Creek Fault Zone, located in eastern Shasta County approximately 60 miles northeast of the landfill. According to the Caltrans California Seismic Hazard Map, West Central Landfill has a 10% probability of experiencing a peak ground acceleration of approximately 0.15 g in the next 50 years, based on an MCE of 6.5 magnitude predicted for the Battle Creek Fault. The California Geologic Survey Probabilistic Seismic Hazards Assessment Ground Motion Page predicts a 10% probability of experiencing a peak ground acceleration of 0.21 g.
36. The facility receives an average of 39 inches of precipitation per year (measured at Redding Fire Station No. 2) as provided by the California Department of Water Resources *Rainfall Analysis for Drainage Design, Volume II, Long Duration Precipitation Frequency Data, Bulletin 195*, October 1976. Nearly all precipitation occurs as rainfall during the wet weather season (November through March). The average unadjusted evaporation rate at the site is approximately 79 inches per year as provided by the California Department of Water Resources *Evaporation from Water Surfaces in California, Bulletin 73-70*, November 1979. Applying a 0.7 pan evaporation coefficient yields an applied evaporation rate of 55 inches per year.
37. The 100-year, 24-hour precipitation event for the facility is estimated to be 7.91 inches, based on National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Point Precipitation Frequency Estimates, as interpolated for the site.
38. The 1,000-year, 24-hour precipitation event for the facility is estimated to be 10.2 inches, based on National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Point Precipitation Frequency Estimates, as interpolated for the site.

39. The waste management facility is not within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community-Panel Number 0600570350B.

SURFACE WATER AND GROUNDWATER CONDITIONS

40. 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.
41. Surface water drainage from the site is toward Dry Creek, a tributary of Cottonwood Creek, in the Redding Enterprise Flat Hydrologic Area (508.10) of the Sacramento Hydrologic Basin.
42. The designated beneficial uses of Cottonwood Creek, as specified in the Basin Plan, are municipal and domestic supply; agricultural supply; water contact recreation; non-contact water recreation; warm fresh water habitat; cold freshwater habitat; cold water migration of aquatic organisms; spawning, reproduction, and/or early development; and wildlife habitat.
43. The first encountered groundwater ranges from about 80 feet below ridge tops to three feet below the native ground surface in the canyon bottoms. Artesian groundwater conditions have been observed in the canyon hydraulically downgradient of the landfill Units. Groundwater elevations range from about 990 feet MSL hydraulically upgradient of the Units to about 917 feet MSL hydraulically downgradient of the Units.
44. Monitoring data from well MW-19 indicates that background groundwater quality for first encountered groundwater has electrical conductivity (EC) ranging between 178 and 192 micromhos/cm, with total dissolved solids (TDS) ranging between 105 and 125 milligrams per liter (mg/L).
45. The direction of groundwater flow is generally toward the east and southeast of the landfill. The estimated average groundwater velocity is 30 feet per year.
46. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are domestic and municipal water supply, agricultural supply, industrial service supply, and industrial process supply.

GROUNDWATER MONITORING

47. The current groundwater monitoring network for the landfill consists of 10 monitoring wells installed in various locations around the Phase 1 and Phase 2 Units. Wells MW-12 and MW-19 are background monitoring wells located on the west side of the Phase 2 Unit, wells MW-2, MW-6A, MW-6B, MW-9, MW-10, and MW-20 are compliance wells located hydraulically downgradient of the Units, and wells MW-17 and MW-18 are

crossgradient of the Phase 2 Unit on the south and north sides, respectively, as shown on Attachment C. Groundwater monitoring well details are listed in the table below:

Well No.	Casing	Total Depth	Screen Interval	Well Type
MW-2	2" PVC	50 ft bgs	22 to 50 ft bgs	Compliance
MW-6A	6" Steel	19 ft bgs	13 to 19 ft bgs	Compliance
MW-6B	4" PVC	45 ft bgs	19 to 39 ft bgs	Compliance
MW-9	4" PVC	120 ft bgs	95 to 115 ft bgs	Compliance
MW-10	4" PVC	40 ft bgs	20 to 40 ft bgs	Compliance
MW-12	4" PVC	130 ft bgs	100 to 130 ft bgs	Background
Well No.	Casing	Total Depth	Screen Interval	Well Type
MW-17	4" PVC	160 ft bgs	135 to 160 ft bgs	Compliance
MW-18	4" PVC	120 ft bgs	100 to 120 ft bgs	Compliance
MW-19	4" PVC	90 ft bgs	60 to 90 ft bgs	Background
MW-20	4" PVC	40 ft bgs	25 to 40 ft bgs	Compliance

ft bgs = feet below ground surface

48. Former groundwater monitoring wells MW-1, MW-3, MW-4, MW5A, MW-7, MW-8S, MW-8D, MW-11, and MW-16 were once utilized in the detection monitoring program, but have subsequently been abandoned/destroyed during the operational history of the landfill. Well MW-20 may need to be abandoned during construction of sub-Unit 2-4C in 2015. If well MW-20 is required to be abandoned, then a new well (MW-21) will be installed near the point of compliance for sub-Unit 2-4C.
49. At the time this Order was adopted, the Discharger's monitoring program for groundwater at the landfill satisfied the requirements contained in Title 27.
50. 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 waste 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.

51. 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.
52. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a landfill Unit, the SPRRs specify a non-statistical method for the evaluation of monitoring data for non-naturally occurring compounds. The specified non-statistical method for evaluation of monitoring data provides two criteria (or triggers) for making the determination that there has been a release of non-naturally occurring waste constituents from a landfill Unit. The presence of two non-naturally occurring waste constituents above their respective method detection limit (MDL), or one non-naturally occurring waste constituent detected above its practical quantitation limit (PQL) [a.k.a. laboratory reporting limit (RL)], indicates that a release of waste from a Unit has occurred. Following an indication of a release, verification testing must be conducted to determine whether there has been a release from the landfill Unit or the detection was a false detection. The detection of two non-naturally occurring waste constituents above the MDL as a trigger is appropriate due to the higher risk of false-positive analytical results and the corresponding increase in sampling and analytical expenses from the use of one non-naturally occurring waste constituent above its MDL as a trigger.
53. For a naturally occurring constituent of concern, Title 27 requires concentration limits for each constituent of concern be determined as follows:
 - a. By calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or
 - b. By an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).
54. The Discharger submitted a 5 May 2016 Water Quality Protection Standard (WQPS) report proposing statistical data analysis methods to calculate concentration limits for each monitored constituent in accordance with Title 27. The WQPS report used intrawell data analysis to calculate concentration limits for inorganic constituents. For organic constituents, the laboratory reporting limit is used for the concentration limit.

CONTACT WATER AND LEACHATE MANAGEMENT

55. Contact water (storm water that mixes with waste at the active face) control begins at the working face where earthen berms segregate contact water from storm water. The

berms culminate at the eastern edge of the waste management unit (WMU), and funnel the contact water into drainage pipes leading to the Contact Water Surge Pond. The Surge Pond allows for sedimentation and litter control in the contact water flow. It also acts as a buffer for the large contact water surges a storm can bring. A riser pipe in the Surge Pond provides for a steady rate of discharge to the below-grade drainage pipe flowing, by gravity, to the Contact Water Pumping Pond located at the southern toe of the Phase 1 WMU, near the Leachate and Phase 1 Underdrain wet wells. At the Pumping Pond, which previously was the Phase 1 Leachate Pond, mechanical floats provide for the automatic start and stop of the Contact Water Pump located at the pond. The Pump conveys the contact water to the first of two Contact Water Storage Ponds located just north of Unit 3, along the east edge of the Phase 1 WMU. The contact water then flows from the first to the second Storage Pond via a connecting drainage pipe. During the dry-season, the contact water in the Storage Ponds is mixed, via interconnected piping, with retained storm water in the southernmost Storm Water Retention Pond and the resulting water is used for dust suppression activities at the Phase 2 WMU.

56. The Phase 1 Unit has a LCRS above its base liner that consists of a 10-foot wide by two-foot tall berm of cobbles and graded gravel centrally located along the bottom of the Phase 1 canyon alignment. Historically, leachate from the Phase 1 Unit discharged to a clay-lined pond near the south toe of the Unit. This pond is now the location of the Contact Water Pumping Pond and the Leachate Wet Well. At the south, downgradient end of the Unit, the cobble/gravel berm overlays a 15-foot section of perforated PVC pipe that is currently plumbed to the Leachate Wet Well. Leachate flows along the cobble/gravel berm and enters the perforated pipe, which drains to the Leachate Wet Well, where it is then pumped to Unit 3 and Unit 4. As of the date of this Order, the Phase 1 LCRS has not produced a discharge in over 10 years.
57. The Phase 2 Unit LCRS consists of a continuous layer of gravel (six inches thick in sub-Units 2-1A and 2-1B; one foot thick in sub-Units 2-1C, 2-2, and 2-1D; two feet thick in sub-Units 2-3, 2-4A, 2-4B and 2-4C) above the base liner. A combination of strategically located berms and ditches built into the base liner of the various sub-Units directs leachate to perforated HDPE lateral collection pipes that are connected to the Leachate Main Line. The Leachate Main Line runs west-to-east down the Phase 2 canyon alignment and allows accumulated leachate to flow by gravity to the Leachate Wet Well, where it's pumped to the Class II surface impoundments.
58. The Class II surface impoundments (Unit 3 and Unit 4) are equipped with leak detection systems (LDS) installed between the clay layer and the HDPE geomembrane as described in Finding 10 above. The Unit 3 and Unit 4 LDSs drain to collection sumps which are regularly monitored by the Discharger and provide early leak detection for the Units. At the time this Order was adopted, discharge has never been observed in the Unit 3 and Unit 4 LDS sumps.

59. Unit 3 was originally designed and constructed to contain a 1,000-year 24-hour storm event in addition to estimated leachate volumes produced at the Phase 1 and Phase 2 Units. It has a capacity of 260,000 gallons with two feet of freeboard and a total "full" capacity of 450,000 gallons. In 2002, the Phase 2 Unit 1-2 Underdrain was connected to the Leachate Main Line, which ultimately conveys leachate to the Class II surface impoundment. The connection to the Leachate Main Line is controlled by a valve that remains closed, except when landfill staff manually open the valve each month to record the volume of liquid being transferred to the LCRS. Flow from the Phase 2 Unit 1-2 Underdrain is sporadic and minimal. In 2014, discharge from the Phase 1 Underdrain was also conveyed to Unit 3 and Unit 4 via the Phase 1 Underdrain Wet Well. The Phase 1 Underdrain discharges at rates ranging from 50 to 100 gallons/hour. The higher discharge rates are observed during and shortly after heavy precipitation events.
60. In January 2015, the Discharger notified Central Valley Water Board staff that based on current discharge rates into the Class II surface impoundment (leachate and underdrain liquids), liquid levels could soon impact the two-feet of freeboard required for the impoundment.
61. Additional leachate storage capacity was necessary to accommodate the current discharge rates into the Class II surface impoundment. The Discharger was required to construct additional leachate storage facilities by 1 November 2015 to accommodate anticipated leachate and Unit underdrain liquid volumes. On 20 November 2015, the construction of the uncovered Class II surface impoundment (Unit 4) was completed. On 6 January 2016, the Discharger submitted a construction quality assurance (CQA) report documenting the construction of Unit 4. Leachate is piped to Unit 4 by a manually activated distribution valve, installed along the Leachate Main Line, which allows leachate to bypass Unit 3 and directs leachate to Unit 4.

UNSATURATED ZONE MONITORING

62. Monitoring of the unsaturated zone beneath the Phase 1 and Phase 2 Units is not practical due to the presence of shallow groundwater. However, both Units have underdrain systems installed beneath the base liners, which function as early leak detection systems. The Phase 1 Underdrain and the Phase 2 Unit 1-2 Underdrain have both been impacted by a release of waste from their respective Units, and liquids from both systems are pumped to the Class II surface impoundment. No discharge has been observed from the Phase 2 Unit 3-4 Underdrain since its installation.
63. The Class II surface impoundments (Unit 3 and Unit 4) have no unsaturated zone monitoring devices installed beneath their base liner systems. However, the Discharger regularly monitors LCRSs installed between their geomembranes and clay liners. No discharge has been observed from the Class II surface impoundment LCRSs.
64. As new sub-Units are constructed for expansion of the Phase 2 Unit, underdrain systems will also expand and leak detection systems will be installed at strategic

locations to provide the earliest possible detection of a leak from the Unit(s). Pan lysimeters or other type of unsaturated zone monitoring devices will be required to be installed beneath future Class II surface impoundments to satisfy Title 27 requirements for monitoring the unsaturated zone.

GROUNDWATER DEGRADATION AND CORRECTIVE ACTION

65. There is evidence of leachate impacts in the downgradient groundwater monitoring wells, although the impacts are slight. Well MW-2, the furthest downgradient well, has water quality similar to liquid from the Phase 2 Unit-4A leak detection system. Closer to the Units, wells MW-6A, MW-6B, and MW-10 also show higher mineralization than upgradient wells, with well MW-6B having water quality similar to liquid from the Phase 2 Unit-4A leak detection system. However, chloride concentrations in wells MW-2 and MW-6B have statistically significant decreasing trends since 2006. Water quality in upgradient wells do not show leachate impacts, as mineral concentrations tend to be lower than wells downgradient of the Units.
66. Both upgradient and downgradient groundwater monitoring wells have periodically had low concentration VOC detections. However, many of the recent VOC detections (since 2011) are suspect due to VOCs also being detected in laboratory equipment blanks and trip blanks. The Discharger is currently evaluating other laboratories that may provide better quality assurance/quality control. VOC detections in upgradient wells (MW-12 and MW-19) are a result of impacts from landfill gas.
67. In downgradient wells, MW-2 has had periodic VOC detections through 2008. All VOCs detected in MW-2 between 2012 and 2014 were also detected in trip and/or laboratory equipment blanks. MW-2 also had detections for the semi-volatile organic compounds (SVOCs) bis-(2-ethylhexyl)phthalate (17 µg/L) and diethylphthalate (0.9 µg/L) in 2008. In MW-6A, 1,1-dichloroethane and di-isopropyl ether have been consistently detected at concentrations below laboratory reporting limits since 2006. The SVOCs bis(2-ethylhexyl)phthalate and diethylphthalate were detected at 19 µg/L and 0.6 µg/L (J flagged) in January 2013. In well MW-6B, there have been periodic VOC detections in the past, and between 2012 and 2014, acetone, chloroform, and ter-butyl alcohol were each detected once at concentrations below laboratory reporting limits. A detection for bis-(2-ethylhexyl)phthalate below laboratory reporting limits occurred in 2008. There have been periodic VOC detections in well MW-9, mainly before 2008. In March 2013, tert-butyl alcohol was detected at 2.59 µg/L (J flagged) and the SVOC di-n-octylphthalate was detected at 0.3 µg/L (J flagged) in January 2013. Well MW-10 has had periodic VOC detections, and between 2012 and 2014, tert-butyl alcohol and chloroform were each detected once at concentrations below laboratory reporting limits. The SVOC bis-(2-ethylhexyl)phthalate was detected at 1 µg/L (J flagged) in January 2013. Well MW-17 has had periodic VOC detections, with 1,2,4-trimethylbenzene, o-xylene, and m,p-xylenes detected below laboratory reporting limits between 2012 and 2014. Well MW-17 also had a detection for bis-(2-ethylhexyl)phthalate below laboratory reporting limits in January 2013. Well MW-18 has had detections for 1,2,4-trimethylbenzene, toluene,

and xylenes in the past. Between 2012 and 2014, 2-chlorotoluene, tert-butyl alcohol, chloroform, and toluene were detected at concentrations below laboratory reporting limits. The SVOC bis-(2-ethylhexyl)phthalate was also detected at concentrations below laboratory reporting limits in January 2008 and January 2013. Between 2012 and 2014, well MW-20 had detections of carbon disulfide, tetrahydrofuran, and tert-butyl alcohol below laboratory reporting limits and a detection of bis-(2-ethylhexyl)phthalate at 64 µg/L.

68. As described in Finding 11 above, the landfill has a GCCS with in-fill vertical extraction wells. Operation of the GCCS is part of the corrective actions proposed by the Discharger for responding to VOC detections in groundwater, especially impacts observed in upgradient groundwater monitoring wells. Additional corrective actions proposed by the Discharger include partial final closure of the Phase 2 Unit. A final cover system will be installed over the western portion of the Unit to prevent precipitation infiltration into buried wastes. These WDRs require the first partial final closure project for the Phase 2 Unit to be completed by 1 November 2020.

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.”
70. 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.”
71. In November 2002, the Discharger provided a report evaluating several different alternative liner designs to determine the most cost effective design that still meets the liner performance standards contained in Title 27. This liner performance demonstration was completed prior to construction of the Phase 2-3 sub-Unit. Liner designs were evaluated using the EPA's Hydrologic Evaluation of Landfill Performance (HELP) model to estimate the amount of leachate generated, collected, and lost to the underlying groundwater. These values were then input into a groundwater model that utilizes the computer codes MODFLOW for groundwater flow and MT3D for contaminant transport. Site specific data and local geology were also utilized to perform the demonstration. Additional support information was provided by the Discharger's consultant in February

2003. On 28 February 2003, Central Valley Water Board staff approved the liner performance demonstration for the Phase 2–3 sub-Unit. All subsequent sub-Unit base liner systems have been constructed using the design evaluated and approved in the liner performance demonstration described above. The approved base liner system consists of (from bottom to top) a 12-inch compacted clay layer with hydraulic conductivity of 1×10^{-7} cm/sec, a GCL, a 60-mil HDPE geomembrane, a geotextile, and a two-foot gravel drainage layer. The two-foot gravel drainage layer may be reduced to one-foot thickness for future sub-Units due to the significant cost for the extra foot of gravel. The Discharger is considering adding a one-foot soil operations layer with CQA controls to prevent clogging in place of the top one-foot gravel drainage layer.

CONSTRUCTION AND ENGINEERED ALTERNATIVE DESIGNS

72. On 17 June 1993, the State Water Board adopted Resolution 93-62 implementing a State Policy for the construction, monitoring, and operation of municipal solid waste landfills that is consistent with the federal municipal solid waste regulations promulgated under 40 Code of Federal Regulations section 258 (a.k.a. Subtitle D). Resolution 93-62 requires the construction of a specified composite liner system at new municipal solid waste landfills, or expansion areas of existing municipal solid waste landfills, that receive wastes after 9 October 1993. Resolution 93-62 also allows the Central Valley Water Board to consider the approval of engineered alternatives to the prescriptive standard. Section III.A.b. of Resolution 93-62 requires that the engineered alternative liner systems be of a composite design similar to the prescriptive standard.
73. 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 design 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).
74. 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.
75. The Discharger proposes liner systems 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.

76. In February 2003, Central Valley Water Board staff approved an engineered alternative liner design for construction of the Phase 2–3 sub-Unit. That liner design consists of, in ascending order, a prepared subgrade; a 12-inch thick compacted clay layer with a bentonite additive to achieve a maximum permeability of 1×10^{-7} cm/sec; a GCL; a 60-mil HDPE geomembrane; a 16-oz non-woven geotextile; and a two-foot thick gravel drainage layer. Side slopes are lined with, in ascending order, a geotextile layer installed above a prepared subgrade, a GCL layer, a 60-mil HDPE geomembrane, and a geocomposite drainage net. All subsequent sub-Unit liners constructed after the Phase 2–3 sub-Unit will have the same engineered alternative design described above, unless the Discharger proposes a new engineered alternative meeting the requirements of Title 27, which is supported by a liner performance demonstration and approved by the Executive Officer. The gravel drainage layer thickness over new base liner systems may be altered as described in Finding 71 above.
77. The Discharger adequately demonstrated that construction of a Subtitle D prescriptive standard liner would be unreasonable and unnecessarily burdensome when compared to the engineered alternative design. On-site soils cannot achieve the permeability requirements without the addition of bentonite additives. The cost of importing bentonite to amend the additional one-foot thickness of the soil barrier layer required for the prescriptive standard liner design would cost substantially more than the engineered alternative design. The Discharger previously demonstrated that the proposed engineered alternative is consistent with the performance goals of the prescriptive standard and it affords equivalent or better protection against water quality impairment.
78. The Class II surface impoundments (Units 3 and 4) used for storage and evaporation of leachate have different base liner systems. Unit 3 has a base liner system consisting of (in ascending order) a two-foot thick clay layer with hydraulic conductivities measured in the mid to high 10^{-7} cm/sec range, a geotextile, a geonet drainage layer, a second geotextile, and an 80-mil HDPE geomembrane. Unit 3 has a leak detection system (LDS) consisting of a two-inch diameter slotted PVC pipe running north-south along the central axis of the pond that was installed within a sand-filled trench lined with geotextile beneath the geomembranes and above the clay layers. Unit 4 has a base liner system consisting of (from bottom to top) a one foot thick clay layer (floor only), a geosynthetic clay liner, a 60 mil secondary geomembrane, a geonet (LCRS/LDS), and a 60 mil primary geomembrane. Unit 4 has a LDS comprised of a two-inch diameter perforated PVC pipe within a pea gravel sump wrapped with geotextile, located at the southeast corner of the impoundment, below the HDPE geomembrane and above the GCL. Any liquid that enters the geonet drainage layer would enter the LDS, which is connected to a collection sump located just east of the south end of Unit 3, and at the eastern edge of Unit 4. Any new Class II surface impoundment(s) needed for additional storage of leachate will be designed and constructed in accordance with the prescriptive and performance standards of Title 27. Alternative liner designs meeting the performance standards of Title 27 may be proposed for Central Valley Water Board Executive Officer review and approval.

79. The October 2014 ROWD includes a stability analysis for West Central Landfill pursuant to Title 27, section 21750(f)(5). The steepest and longest anticipated slope at closure and a peak horizontal acceleration of 0.21 g was used to analyze stability under static conditions with the computer program Slope/W (Geo-Slope). The slope stability analysis showed that the longest and steepest final cover configuration of the landfill is expected to exceed a dynamic factor of safety of 1.5. The slope stability analysis will be updated prior to beginning partial final closure of the Phase 2 Unit in 2020.
80. This Order approves the Discharger's current liner systems for construction of future sub-Units and Class II surface impoundments as described in Findings 76 and 78, respectively, and requires that the Discharger submit design plans and construction quality assurance (CQA) plans for each new sub-Unit or Unit for review and approval at least 90 days prior to construction.

LANDFILL CLOSURE

81. Title 27, section 21090 provides the minimum prescriptive final cover components for landfills consisting of, in ascending order, the following layers:
- a. Two-foot soil foundation layer.
 - b. One-foot soil low through-flow rate layer with a hydraulic conductivity of 1×10^{-6} cm/s or less, or equal to the hydraulic conductivity of any bottom liner system whichever is less, or an alternative design that provides a correspondingly low through-flow rate throughout the post-closure maintenance period.
 - c. Geomembrane layer (this layer is required for composite-lined landfills for equivalency to bottom liner).
 - d. One-foot soil erosion resistant/vegetative layer.
82. Title 27 allows engineered alternative final covers if the alternative design provides a correspondingly low flow-through rate throughout the post-closure maintenance period.
83. In October 2014, the Discharger submitted a *Preliminary Closure and Post-Closure Maintenance Plan* for closure and post-closure maintenance of the entire Phase 2 Unit. In June 2017, the Discharger submitted the *Fill Plan and Closure Phase 2 Addendum* which updated closure estimate dates to facilitate greater use of available airspace. Partial final closure of the western portion of the Phase 2 Unit covering approximately 37 acres is proposed as corrective action due to observed impacts to groundwater quality in the vicinity of the landfill. The first partial final closure project is scheduled for 2020, and these WDRs require completion of final cover construction by 1 November 2020. The Discharger anticipates completing additional partial final closure projects in the Phase 2 Unit approximately every five years thereafter. The last of four planned partial final closure projects is anticipated to be completed in 2034, capping the entire Phase 2 Unit.

With the exception of the first phased partial final closure date of 1 November 2020 (required as part of corrective action), future partial final closure dates are just estimates that will be affected by landfill waste acceptance receipts.

84. The Discharger proposes a final cover system for the Phase 2 Unit meeting the requirements for a prescriptive final cover in accordance with Title 27, section 21090(a) consisting of, in ascending order, the following layers:
- a. Two-foot thick soil foundation layer;
 - b. A needle-punched, non-woven polypropylene geotextile for cushioning;
 - c. A 60-mil linear-low density polyethylene (LLDPE) geomembrane;
 - d. One-foot thick soil erosion resistant layer, with vegetation.
85. Side slopes for the closed landfill will be sloped at 5H:1V and will include 15-foot wide benches every 50 vertical feet as required by Title 27.
86. The October 2014 ROWD includes a stability analysis for West Central Landfill. The steepest and longest anticipated slope at closure and a peak horizontal acceleration of 0.21 g was used to analyze stability under static conditions with the computer program Slope/W (Geo-Slope). The slope stability analysis showed that the longest and steepest final cover configuration of the landfill is expected to exceed a dynamic factor of safety of 1.5. The slope stability analysis will be updated prior to beginning partial final closure of the Phase 2 Unit in 2020.
87. 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.
88. This Order approves the proposed final cover and requires that a Final Closure and Post-Closure Maintenance Plan, design documents, and CQA plan be submitted for review and approval at least 180 days prior to actual closure.

LANDFILL POST-CLOSURE MAINTENANCE

89. In October 2014, the Discharger submitted a *Preliminary Closure and Post-Closure Maintenance Plan* for closure and post-closure maintenance of the entire Phase 2 Unit. In June 2017, the Discharger submitted the *Fill Plan and Closure Phase 2 Addendum* which updated closure estimate dates to facilitate greater use of available airspace. 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, perimeter landfill gas

monitoring wells, GCCS, access roads, 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.

90. 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.
91. 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

92. 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 October 2014 *Preliminary Closure and Post-Closure Maintenance Plan* includes a cost estimate for closure of the Phase 2 Unit. This amount has since been updated to adjust for inflation. The updated total amount of the closure cost estimate in 2017 dollars is \$14,154,746. 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 adjusted annually for inflation. In a 6 September 2017 correspondence, staff from CalRecycle's Financial Assurances Unit indicated that the Enterprise Fund balance for closure, post-closure maintenance, and corrective action costs at West Central Landfill was adequately funded.
93. Title 27, sections 21840 and 22211 requires a cost estimate for landfill post-closure maintenance. The Discharger's October 2014 *Preliminary Closure and Post-Closure Maintenance Plan* includes a cost estimate for landfill post-closure maintenance. This amount has since been updated to adjust for inflation. The updated amount of the cost estimate for post-closure maintenance in 2017 dollars is \$6,685,715. This Order requires that the Discharger to maintain financial assurance with CalRecycle in at least the amount of the post-closure maintenance cost estimate adjusted annually for inflation. In a 6 September 2017 correspondence, staff from CalRecycle's Financial Assurances Unit indicated that the Enterprise Fund balance for closure, post-closure maintenance, and corrective action costs at West Central Landfill was adequately funded.

94. 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.
95. The Discharger has provided a 17 January 2014 revised *Site Specific Non-Water Release Corrective Action Plan and Cost Estimate* in the amount of \$640,360 and an 11 December 2014 *Corrective-Action Cost Estimate for a Reasonably Foreseeable Water-Related Release* in the amount of \$645,490, which in February 2017, was updated to \$670,326. The water-related corrective action scenario involves a groundwater pump-and-treat system installed hydraulically downgradient of the Phase 1 and Phase 2 Units, with discharge of the treated groundwater to an evaporation pond. In accordance with Title 27, section 22221, the Discharger is required to demonstrate financial assurances in the amount of the higher water-release corrective action cost estimate. In an 6 September 2017 correspondence, staff from CalRecycle's Financial Assurances Unit indicated that the Enterprise Fund balance for closure, post-closure maintenance, and corrective action costs at West Central Landfill was adequately funded.

CEQA AND OTHER CONSIDERATIONS

96. The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resource Code section 21000, et seq., and the CEQA guidelines, in accordance with Title 14, section 15301.
97. 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 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.

98. Based on the threat and complexity of the discharge, the facility is determined to be classified Category 2-B as defined below:

- a. Category 2 threat to water quality, defined as, "Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance."
- b. Category B complexity, defined as, "Any discharger not included in Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management units."

99. 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.

100. The technical reports required by this Order and the attached "Monitoring and Reporting Program No. R5-2015-0089" 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

101. 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.

102. 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.

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

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

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

or will be provided upon request.

IT IS HEREBY ORDERED, pursuant to California Water Code sections 13263 and 13267, that Order No. R5-2005-0068 is rescinded except for purposes of enforcement, and that Shasta County and the City of Redding, 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' or 'designated 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., and 'designated waste' is as defined in Title 27.
2. The discharge of treated wood waste is prohibited in accordance with California Health and Safety Code, section 25150.7(d)(2)(C), due to an ongoing release of waste that is impacting water quality as observed in landfill groundwater monitoring wells. Once corrective actions result in cessation of the release, then the Discharger may request revision of this Order to once again allow the discharge of treated wood waste in accordance with all applicable laws and regulations.
3. The Discharger shall comply with all applicable Standard Prohibitions listed in Section C of the Standard Provisions and Reporting Requirements (SPRRs) dated January 2012 which are attached hereto and made part of this Order by reference.

B. DISCHARGE SPECIFICATIONS

1. The Discharger shall only discharge the wastes listed or allowed under the Waste Classification and Unit Classification section in the Findings of this Order.
2. The Discharger may not use any material as alternative daily cover (ADC) that is not listed as approved ADC in the Findings of these WDRs unless and until the Discharger demonstrates it meets the requirements of Title 27, section 20705, and the Discharger has received approval that it may begin using the material as ADC.

3. The Discharger shall use approved ADC only in internal areas of the landfill that do not drain outside of the limits of the contiguous landfill units unless the Discharger demonstrates that runoff from the particular ADC is not a threat to surface water quality and the demonstration has been approved. This demonstration may take removal of sediment or suspended solids into account for landfills where surface water drains to a sedimentation basin.
4. The Discharger may continue to use processed green waste generated at the City of Redding's composting operation and wastewater treatment sludge as ADC, provided these materials are only applied during dry weather and only after laboratory analysis of the material shows that the ADC is non-hazardous and non-designated waste.
5. With the exception of geosynthetic tarps, all ADC shall be covered with six inches of clean soil or tarps prior to any measureable precipitation event.
6. 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 what actions will be taken to prevent re-occurrence. If the waste is a hazardous waste, the Discharger shall immediately notify the Department of Toxic Substances Control.
7. Leachate and/or landfill gas condensate may be returned only to the Phase 2 Unit, and future compositely lined sub-Units in accordance with Standard Discharge Specifications D.2 through D.4 of the SPRRs.
8. The Discharger shall comply with all applicable Standard Discharge Specifications listed in Section D of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

C. FACILITY SPECIFICATIONS

1. Class II surface impoundments shall be operated and maintained to ensure that sufficient freeboard exists to accommodate seasonal precipitation and the design storm listed in Title 27, Table 4.1. Two feet of freeboard or more shall be maintained at all times during the operational life of the landfill and throughout the post-closure maintenance period.
2. The Discharger shall comply with all applicable Standard Facility Specification listed in Section E of the SPRRs dated January 2012 which are part of this Order.
3. The Discharger shall comply with all applicable Storm Water Provisions listed in Section L of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

D. CONSTRUCTION SPECIFICATIONS

1. Unless the Discharger proposes an engineered alternative base liner system design specifically supported by a liner performance demonstration that is approved by the Executive Officer, all Class III Unit base liner systems constructed after the Phase 2–4B sub-Unit shall be comprised, in ascending order, of the following:
 - a. A prepared subgrade overlain by 12 inches of compacted clay with a maximum hydraulic conductivity of 1×10^{-7} cm/sec or less;
 - b. A GCL layer;
 - c. A 60-mil HDPE geomembrane;
 - d. A geotextile layer;
 - e. A LCRS; and
 - f. A two-foot thick gravel drainage layer (or one-foot gravel drainage layer overlain by a one-foot thick soil operations layer with additional CQA measures implemented to prevent clogging).
2. Class III Unit side slope liner systems shall be comprised, in ascending order, of the following:
 - a. A prepared subgrade overlain by a geotextile layer;
 - b. A GCL layer;
 - c. A 60-mil HDPE geomembrane;
 - c. A geocomposite drainage net.
3. Class II surface impoundments installed after Unit 3 for the storage of leachate shall be designed and constructed to meet performance standards of Title 27, sections 20310 and 20375 and the Construction Standards listed in Title 27, Table 4.1.
4. Class II surface impoundment containment systems shall include a composite liner system with (1) an upper synthetic flexible membrane liner component (that's at least 60-mils thick for HDPE) installed in direct and uniform contact with a lower compacted soil component at least two feet thick with a hydraulic conductivity of 1×10^{-7} cm/sec or less (Prescriptive Standard); or (2) a composite liner system with an engineered alternative design that meets the performance criteria for Class II Units and surface impoundments in accordance with Title 27. Liner systems utilizing an engineered alternative design shall comply with requirements of Title 27, section 20080(c) and (d). For double composite liner systems, a LCRS is required to be installed between the primary and secondary liners.

5. Class II surface impoundments shall include a pan lysimeter or other type of unsaturated zone monitoring device(s) installed beneath the lowest point of the base liner system to provide the earliest possible detection of a release from the Unit.
6. Additional leachate storage capacity is necessary at the landfill due to additional liquids being collected in the LCRS from the Phase 1 Unit and Phase 2 Unit underdrain systems. This Order requires the Discharger to install additional leachate storage facilities, such as an additional Class II surface impoundment, **by 1 November 2015**. If a new Class II surface impoundment is installed at the site, it will be referred to as Unit 4. Provide a final construction report demonstrating that the additional leachate storage facilities were constructed in accordance with approved construction plans **by 31 December 2015**.
7. 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.
8. 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.
9. The Discharger shall comply with all applicable Standard Construction Specifications listed in Section F of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

E. CLOSURE AND POST-CLOSURE MAINTENANCE SPECIFICATIONS

1. The Discharger shall submit a final or partial final closure and post-closure maintenance plan at least two years prior to proposed closure of any portion of the landfill in accordance with requirements in Section G of the Standard Closure and Post-Closure Specifications in the SPRRs.
2. The Discharger has proposed partial final closure of the western portion of the Phase 2 Unit as part of corrective actions in response to the ongoing release of waste from the Unit. This Order requires the Discharger to complete partial final closure of the western portion of the Phase 2 Unit **by 1 November 2020**. The Discharger shall submit a Partial Final Closure and Post-Closure Maintenance Plan **by 1 November 2018** in accordance with Closure and Post-Closure Maintenance Specification E.1 above.

The Discharger shall close the Phase 2 Unit with a final cover as proposed in the October 2014 *Preliminary Closure and Post-Closure Maintenance Plan (PCPCMP)* and as approved by this Order. The components of the approved final cover system, as proposed in the PCPCMP, are listed in Finding 84.

The Discharger shall obtain revised WDRs prior to closure utilizing 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.

The Discharger shall close the landfill with side slopes at steepness of 3H:1V or less, and top deck areas shall be sloped at three percent or greater.

The Discharger has installed an infill landfill gas extraction system for the Phase 1 and Phase 2 Units, and continues to augment the infill gas extraction system as the Phase 2 Unit expands. Landfill gas shall continue to be extracted from closed landfill units until such time that landfill gas is no longer a threat to water quality as documented by the Discharger and approved by the Executive Officer.

Wherever possible, the Discharger shall seal the edges of the final cover by connecting the cover geomembrane to the liner geomembrane.

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.

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 and maintain necessary erosion and sedimentation controls to prevent erosion and sediment in runoff from the closed landfill during the post-closure maintenance period.

By 1 November 2015, The Discharger shall complete a five-year iso-settlement survey of the Phase 1 Unit and submit an iso-settlement map accurately depicting the estimated total change in elevation of the final cover's low-hydraulic conductivity layer, in accordance with Title 27, section 21090(e)(1 & 2), for comparison to the baseline topographic map that was created when the Unit closed. Iso-settlement surveys shall be completed and iso-settlement maps submitted every five years thereafter.

The Discharger shall comply with all applicable Standard Closure and Post-Closure Specifications listed in Section G and all Standard Construction Specifications that are applicable to closure in Section F of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

F. FINANCIAL ASSURANCE SPECIFICATIONS

1. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for closure and post-closure maintenance costs at West Central Landfill in at least the amounts described in Findings 92 and 93, 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 **1 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 water-release corrective action cost estimate described in Finding 95, adjusted for inflation annually. A report regarding financial assurances for corrective action shall be submitted to the Central Valley Water Board by **1 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. The Discharger shall comply with all applicable Standard Financial Assurance Specifications listed in Section H of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

G. MONITORING SPECIFICATIONS

1. For surface water and the unsaturated zone, the Discharger shall comply with the detection monitoring program provisions of Title 27, Monitoring and Reporting Program (MRP) No. R5-2015-0089, and the Standard Monitoring Specifications listed in Section

I of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

2. For groundwater, the Discharger shall comply with the corrective action monitoring program provisions of Title 27, MRP No. R5-2015-0089, and the Standard Monitoring Specifications listed in Section I of SPRRs dated January 2012 which are attached hereto and made part of this Order by reference. Compliance with the corrective action program shall continue until completion of corrective action is demonstrated pursuant to Title 27, section 20430(g).
3. The Discharger shall provide a Sample Collection and Analysis Plan **by 1 November 2015** in accordance with Standard Monitoring Specification I.7 of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference. The Sample Collection and Analysis Plan shall specifically describe sample quality assurance/quality control procedures during shipping to a State certified laboratory.
4. The Discharger shall provide an updated Water Quality Protection Standard Report, including updated concentration limits and monitoring points, **by 1 November 2015**. The updated Water Quality Protection Standard Report shall also describe the data analysis method used to calculate the concentration limits and to determine if there is measurably significant evidence of a release in accordance with Title 27, sections 20400 and 20415(e).
5. The Discharger shall assess landfill gas for VOC impacts at each perimeter gas monitoring probe using USEPA Method TO-14. A Work Plan for VOC Assessment of Landfill Gas shall be submitted **by 31 December 2015**. A report providing results of the gas assessment, including recommendations for additional assessment and/or corrective action, if necessary, shall be submitted **by 1 June 2016**.
6. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, MRP No. R5-2015-0089, and the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.
7. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the landfill unit that extends through the uppermost aquifer underlying the unit) shall not exceed the concentration limits established pursuant to MRP No. R5-2015-0089.
8. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in MRP No. R5-2015-0089 and the Standard Monitoring Specifications in Section I of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

9. As specified in MRP No. R5-2015-0089, 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.
10. Semi-annual progress reports assessing the effectiveness of corrective actions implemented at the site shall be provided in accordance with Title 27, section 20430(h) and MRP No. 5R-2015-0089.
11. The Discharger shall comply with all applicable Standard Monitoring Specifications and Response to a Release specifications listed in Sections I and J of the SPRRs dated January 2012 which are attached hereto and made part of this Order by reference.

H. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the facility, including the MRP No. R5-2015-0089 and the SPRRs dated January 2012 which are part of this Order, and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 and Subtitle D that are not specifically referred to in this Order.
3. The Discharger shall comply with MRP No. R5-2015-0089, 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 January 2012, 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 comply with all General Provisions listed in Section K of the SPRRs dated January 2012 which are part of this Order.
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

1. 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**
2. Complete construction of additional leachate Storage facilities. (See Construction Specification D.6 above). **By 1 November 2015**
3. Provide a final construction report for review and approval for the new leachate storage facilities demonstrating that construction was completed in accordance with approved construction plans. (See Construction Specification D.6 above). **By 31 December 2015**
4. Submit a final construction report for review and approval upon completion of any new sub-Unit demonstrating that construction was in accordance with approved construction plans. (See Standard Construction Specification F.27 in the SPRRs). **60 days prior to proposed discharge of waste**

B. Closure

1. Submit a Partial Final Closure and Post-Closure Maintenance Plan, design plans, and CQA plan for review and approval. (see Closure and Post-Closure Maintenance Specification E.2 above). **By 1 November 2018**
2. Complete partial final closure of the western portion of the Phase 2 Unit. (See Closure and Post-Closure Maintenance Specification E.2 above). **By 1 November 2020**
3. Complete an iso-settlement survey of the Phase 1 Unit and submit an iso-settlement map. (See Closure and Post-Closure Maintenance Specification E.10 above). **By 1 November 2015**

C. Monitoring

1. Submit a Sample Collection and Analysis **By 1 November 2015**

Plan. (See Monitoring Specification G.3 Above).

2. Submit an updated Water Quality Protection Standard Report. (See Monitoring Specification G.4 above). **By 1 November 2015**
3. Submit a Work Plan for VOC Assessment of Landfill Gas. (See Monitoring Specification G.5 above). **By 31 December 2015**
4. Submit a report providing the results of the landfill gas VOC assessment, including recommendations for additional assessment and/or corrective action, if necessary. (See Monitoring Specification G.5 above). **By 1 June 2016**

I, PATRICK PULUPA, 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 5 June 2015, and amended by Order R5-2018-0054 on 31 May 2018.

ORIGINAL SIGNED BY

PATRICK PULUPA, Executive Officer

DPS