CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2015-XXXX

WASTE DISCHARGE REQUIREMENTS
FOR
SACRAMENTO REGIONAL COUNTY SANITATION DISTRICT
SACRAMENTO REGIONAL WASTEWATER TREATMENT PLANT
BIOSOLIDS AND SOLIDS STORAGE AND DISPOSAL FACILITIES
CLASS II LAND TREATMENT UNITS
UNCLASSIFIED SOLIDS STORAGE BASINS
CLASS III LANDFILL
CONSTRUCTION, CLOSURE, POST-CLOSURE MAINTENANCE
AND CORRECTIVE ACTION
SACRAMENTO COUNTY

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

1. The Sacramento Regional County Sanitation District (hereinafter Discharger) owns and operates treatment, storage and disposal facilities for digested sludge (or 'biosolids') and solids generated from the Sacramento Regional Wastewater Treatment Plant (facility) about eight miles south of Sacramento and one mile east of the town of Freeport, as shown in Attachment A. The facility is located in the Southwest Quarter of Section 17, South Half of Section 18, Section 19, Section 20, Northwest Quarter of Section 29, North Half of Section 30, Township 7 North, Range 5 East, Mount Diablo Baseline Meridian; and the South Half of Section 13, East Half of Section 24, East Half of Section 25, Township 7 North, Range 4 East, Mount Diablo Baseline Meridian. The facility was previously regulated by Waste Discharge Requirements (WDRs) Orders 98-087, 5-01-263, and R5-2003-0076 in conformance with Title 27, California Code of Regulations (27 CCR), Division 2, Subdivision 1 (hereafter Title 27).

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

   a. Attachment A – Site Location Map
   b. Attachment B – Site Plan
   c. Attachment C – Existing Groundwater Wells Plan
   d. Attachment D – Lined Dedicated Land Disposal Areas Monitoring Locations
   e. Attachment E – Closed Class III Landfill Gas Monitoring Locations
   f. Information Sheet
   g. November 2013 Standard Provisions And Reporting Requirements

3. The wastewater treatment plant process area and waste management facilities occupy about 900 acres of the 3,550 acre site. The facilities regulated by these WDRs include

twenty unclassified Solids Storage Basins (SSBs), five Class II land treatment units (LTUs) referred to as Dedicated Land Disposal Units (DLDs) [three active, lined DLDs (L-DLDs) and two closed, unlined (C-DLDs)], and a closed Class III grit and screenings landfill (closed landfill). A site plan of the facility is shown on Attachment B.

4. The SSBs function as sewage sludge treatment and storage units and meet the requirements for exemption from Title 27 provisions, pursuant to Title 27 §20090 (a):

   (a) Sewage—Discharges of domestic sewage or treated effluent which are regulated by WDRs issued pursuant to Chapter 9, Division 3, Title 23 of this code, or for which WDRs have been waived, and which are consistent with applicable water quality objectives, and treatment or storage facilities associated with municipal wastewater treatment plants, provided that residual sludges or solid waste from wastewater treatment facilities shall be discharged only in accordance with the applicable SWRCB-promulgated provisions of this division.

5. The SSBs are exempt from Title 27; however, the SSBs are subject to the State Water Resources Control Board Resolution 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter Resolution 68-16) which prohibits degradation of high quality groundwater unless it has been shown that:

   a. The degradation is consistent with the maximum benefit to the people of the state;

   b. The degradation will not unreasonably affect present and anticipated future beneficial uses;

   c. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and

   d. The discharger employs best practicable treatment or control (BPTC) to minimize degradation.

6. Surface water discharges are regulated by WDR Order R5-2010-0114-003 (National Pollutant Discharge Elimination System Permit CA0077682), which is not subject to the terms of this Order.

7. On 29 May 2015, the Discharger submitted an amended Report of Waste Discharge (ROWD). The information in the ROWD has been used in revising these WDRs. The ROWD contains the applicable information required in Title 27. The ROWD and supporting documents contain information related to this revision/update of the WDRs including:

   a. Evaluating potential groundwater impacts from the SSBs

   b. Utilizing C-DLD 1 for soil stockpiles and haul roads during plant construction work beginning in 2015

c. Converting previously closed C-DLDs 1 and 5 to L-DLDs

d. Clean-closing the closed landfill

e. Redirecting return flow from the Biosolids Recycling Facility (BRF) to the SSBs

8. The existing and future waste management units authorized by this Order are described as follows:

Unit	Area	Liner/LCRS[1] Components[2]	Unit Classification & Status
C-DLD 1 and C-DLD 5[3]	82 acres	Unlined. Cover system - evapotranspirative cover.	Class II, Closed in 2004.
L-DLD 2 to L-DLD 4[3]	123 acres	Single Composite Liner – one foot compacted clay subgrade, 60-mil HDPE, 12-inch blanket LCRS.	Class II, Active.
SSBs (20 ponds)	125 acres	Unlined surface impoundment.	Unclassified, Active.
Grit and Screenings Landfill[4]	23 acres	Ten unlined disposal trenches. Cover system - two feet foundation soils, one foot low permeability soil with $1x10^{-6}$ cm/sec hydraulic conductivity, one foot vegetative cover soil.	Class III, Closed in 1994.

[1] LCRS – Leachate collection and removal system

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

[3] Each C-DLD and L-DLD is comprised of a 37 acre biosolids injection area and a 4 acre lined storm water runoff area.

[4] Waste disposed of in approximately 8 acres of the 23 permitted acres.

9. On 25 April 2003, the Central Valley Water Board issued WDR Order R5-2003-0076 in which the DLDs at the facility were classified as a Class II land treatment units for the discharge of designated waste, the SSBs at the facility were unclassified and exempt from Title 27, and the grit and screenings landfill was classified as closed Class III landfill. This Order continues to classify DLDs as Class II land treatment units and the grit and screenings landfill as a closed Class III landfill in accordance with Title 27. Additionally, this Order continues to classify the SSBs as unclassified and exempt from Title 27.

10. Since the adoption of the 2003 WDRs, the facility improvements include: installation of a liner system on DLD 3 in 2003, closure of DLDs 1 and 5 in 2004, installation of

groundwater monitoring wells in the vicinity of the SSBs, and construction and operation of a BRF.

11. The Discharger began construction of the EchoWater Project in 2015 to update various wastewater treatment process areas, which are not subject to the terms of this Order. In support of the EchoWater Project, the Regional Board approved temporary construction activities on top of C-DLD 1 including stockpiling soil and constructing a haul road for construction equipment. Additionally, the Discharger may clean-close all or a portion of the closed landfill following written approval by the Executive Officer to utilize this area for additional treatment process facilities to be constructed as part of the EchoWater Project.

12. This Order implements the applicable regulations for discharges of solid waste to land through Prohibitions, Specifications, Provisions, and monitoring and reporting requirements. Prohibitions, Specifications, and Provisions are listed in Sections A through H of these WDRs below, and in the Standard Provisions and Reporting Requirements, dated November 2013 (SPRRs) which are attached hereto and made part of this Order. Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) R5-2015-XXXX and in the SPRRs. In general, requirements that are either in regulation or otherwise apply to all facilities regulated under Title 27 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.

WASTE CLASSIFICATION AND UNIT CLASSIFICATION

13. The Discharger proposes to continue to discharge anaerobically digested sludge to the SSBs. The digested sludge has about 0.4% to 3% solids. The solids are composed of about 50% to 80% volatile solids. Digested sludge may also contain variable concentrations of contaminants, such as heavy metals, chlorinated hydrocarbons and pathogens. When the digested sludge is placed in the SSBs, it undergoes further stabilization (i.e., reduction of volatile solids and pathogens). The reduction of volatile solids tends to concentrate constituents such as heavy metals, inorganic chemicals, and stable chlorinated hydrocarbons (i.e., Aroclor (PCBs) compounds).

14. The Discharger also proposes to redirect return flow from the BRF to the SSBs. Currently, approximately 35% of the digested sludge is routed to the BRF for processing to produce a pelletized fertilizer and the rest is discharged to the SSBs. The BRF uses polymer to dewater then thermally dries the digested sludge to EPA 503b Class A quality. Secondary effluent from the wastewater treatment plant is also used in the dryer exhaust for cooling and particulate removal. The BRF then returns the centrate as BRF return flow to the waste water treatment via a sanitary drain. This BRF return flow may contain trace amounts of polymer from dewatering. The BRF return flow contains significantly less solids and reduced ammonia concentration than digested sludge. When

the BRF is not operating, digested sludge flow normally going to the BRF is sent to the SSBs.

15. The stabilized sludge (or biosolids) is in an anaerobic and chemically reduced state when it is harvested from the SSBs and discharged to the L-DLDs. When it is exposed to an aerobic environment it becomes oxidized and, due to microbial action, gains an acid generating potential, which could increase the solubility of several heavy metals. The Discharger conditions the L-DLD soils by adding lime to prevent heavy metals from solubilizing.

16. The stabilized sludge is essentially a liquid waste containing constituents at concentrations that if released under ambient conditions at the facility have the potential to degrade waters of the state. The stabilized sludge is classified as a 'designated waste' pursuant to the criteria set forth in §20210 of Title 27.

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

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

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

    Designated waste can be discharged only at Class I waste management units, or at Class II waste management units which comply with Title 27 and have been approved by the regional board for containment of the particular kind of waste to be discharged.

18. The Discharger provided 2014 monitoring data in the 2014 Annual Monitoring Report for SSBs waste constituents including SSB liquid supernate and digested sludge discharged to the SSBs, as shown on Tables 1 and 2. The liquid supernate concentrations are compared to California primary maximum contaminant levels (primary MCLs), the lowest applicable water quality objective (WQO) for groundwater for protection of drinking water beneficial use for domestic and municipal supply wells, and the background groundwater quality at the site.

19. Solids discharged into the SSBs contain high concentrations of ammonia, total nitrogen, chloride, sulfate, and total phosphorus (Table 1). Additionally, SSB supernate concentrations of total dissolved solids (TDS) and specific conductivity remain above the associated secondary MCLs by more than double (Table 2). SSB supernate is aerated and diluted with storm water lowering concentrations of potential constituents of concern; however, the dilution is not enough to reduce TDS and specific conductivity below the MCLs.

Table 1 – SSB Waste Discharge
Digested Sludge 2014 Average Concentrations

Constituent	Units[1]	Average Concentration
Ammonia	mg/kg	63,000
Nitrate	mg/kg	5
Nitrite	mg/kg	3
Chloride	mg/kg	7,000
Soluble Sulfate	mg/kg	1,300
Arsenic	mg/kg	5.4
Total Nitrogen	mg/kg	125,000
Total Phosphorus	mg/kg	28,000

1. Sample was reported on a dry weight basis

Table 2 – SSB Supernate 2014 Average Concentrations

Constituent	Units		Water Quality Criteria (WQC)/Water Quality Objective (WQO)	
		SSB Average	WQC/ WQO	Reference[1, 2,3, 4]
Total Dissolved Solids (TDS)	mg/L	1,100	500	CDPH Secondary MCL
Specific Conductivity	µmhos/cm	3,900	900	CDPH Secondary MCL
Ammonia Nitrogen	mg/L	430	30	USEPA Health Advisory
Nitrate	mg/L	0.1	10	USEPA Primary MCL
Nitrite	mg/L	1.0	1.0	USEPA Primary MCL
Chloride	mg/L	140	250	CDPH Secondary MCL
Sulfate	mg/L	200	250	CDPH Secondary MCL

1. CDHS = California Department of Public Health
2. USEPA = United States Environmental Protection Agency
3. IRIS RfD = Integrated Risk Information System, Reference Dose
4. MCL = Maximum Contaminant Level

20. The Discharger provided 2014 monitoring data in the 2014 Annual Monitoring Report for biosolids harvested from the SSBs discharged to the L-DLDs and L-DLD leachate, as shown in Tables 3 and 4. The liquid leachate concentrations are compared to California primary maximum contaminant levels (primary MCLs), the lowest applicable water quality objective (WQO) for groundwater for protection of drinking water beneficial use for domestic and municipal supply wells, and the background groundwater quality at the site.

21. Biosolids harvested from the SSBs continue to have high concentrations of ammonia, total nitrogen, chloride, sulfate, and total phosphorus (Table 3) similar to the digested

sludge. The biosolids concentrations are lower than the digested sludge. Additionally, average concentrations of leachate from the L-DLDs show levels of TDS, specific conductivity, nitrate, nitrite, chloride, and sulfate above primary and secondary MCLs (Table 4).

Table 3 – L-DLD Waste Discharge
SSB Harvested Biosolids 2014 Average Concentrations

Constituent	Units[1]	Average Concentration
Ammonia	mg/kg	13,500
Nitrate	mg/kg	1.1
Nitrite	mg/kg	0.9
Chloride	mg/kg	2,300
Soluble Sulfate	mg/kg	800
Arsenic	mg/kg	9.0
Total Nitrogen	mg/kg	51,000
Total Phosphorus	mg/kg	34,000

1. Sample was reported on a dry weight basis

Table 4 – L-DLD Leachate 2014 Average Concentrations

			Water Quality Criteria (WQC)/Water Quality Objective (WQO)	
Constituent	Units	LDLDs Average	WQC/ WQO	Reference[1, 2,3, 4]
Total Dissolved Solids (TDS)	mg/L	4,600	500	CDPH Secondary MCL
Specific Conductivity	µmhos/cm	10,400	900	CDPH Secondary MCL
Ammonia	mg/L	0.1	30	USEPA Health Advisory
Nitrate	mg/L as N	1,100	10	USEPA Primary MCL
Nitrite	mg/L	60	1.0	CDPH Primary MCL
Chloride	mg/L	100	250	CDPH Secondary MCL
Sulfate	mg/L	1,200	250	CDPH Secondary MCL
Arsenic	µg/L	11	10	CDPH Primary MCL
Phosphorus	mg/L	2.3	0.00014	U.S. EPA IRIS RfD

1. CDHS = California Department of Public Health
2. USEPA = United States Environmental Protection Agency
3. IRIS RfD = Integrated Risk Information System, Reference Dose
4. MCL = Maximum Contaminant Level

22. The data indicates that the discharge to the SSBs and L-DLDs consists of or contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state.

Therefore, the discharge is a 'designated waste'. Discharge to the SSBs is exempt from Title 27. However, discharge of the biosolids harvested from the SSBs must be discharged to a Class II waste management unit as required by Title 27.

23. Leachate collected from the L-DLDs and excess SSB supernate is returned to the headworks of the wastewater treatment plant for treatment.

SITE DESCRIPTION

24. Existing on-site land use consists of the wastewater treatment plant processing areas and a significant acreage for buffer isolation for the treatment processes (Bufferlands). The approximately 2,650 acre Bufferlands provides open space minimizing the potential for odor and other nuisances that could impact the surrounding neighborhoods. Additionally, the Bufferlands provides hundreds of acres for wildlife habitat and farmland.

25. The Bufferlands surround the facility by a minimum of 1,000 feet on all sides of the facility to over a mile to the east. Additional land uses within one mile of the facility include water treatment facilities, residential, agriculture, and commercial to the north; industrial, commercial, residential, institutional, public open space/recreation, public parks and public schools to the south; industrial to the east; and agricultural, natural preserve, and public open space to the west.

26. There are no known municipal, domestic, or industrial supply wells within one mile of the facility. Five groundwater supply wells are located on the facility property for use as irrigation and process wells. Locations of these wells are shown on Attachment C.

27. The site geology primarily consists of Riverbank Formation made up of interbedded layers of sand, silt, clay, and gravel. In general, a claypan/hardpan is observed in the upper 15 to 20 feet below ground surface (bgs) overlying a interbedded layer of fine sands and silts to approximately 30 to 35 feet bgs. At approximately 30 to 35 feet bgs, a 15 to 20-foot thick layer of un-cemented to very weakly cemented silts and clays overlays a gravel and cobble layer that may extend to a depth of 140 feet bgs.

28. The measured hydraulic conductivity of the native soils underlying the waste management units ranges between 10^{-4} and 10^{-8} centimeters per second (cm/s).

29. Based on a site-specific seismic analysis, the controlling maximum credible earthquake (MCE) for the site is a combination of events occurring along the Great Valley fault Segment 6 located approximately 35 kilometers from the site and the San Andreas fault located approximately 121 kilometers from the site. The Great Valley fault Segment 6 controls the short periods of shaking at the site (up to 1.2 seconds), while the San Andreas fault controls longer period motions at the site (1.2 seconds and greater). The near-field MCE for the site is a 6.8 Mw located 35 kilometers from the site on the Great Valley fault Segment 6 producing a peak ground acceleration in rock of 0.128 g. The far-

field MCE is an 8.0 Mw located 121 kilometers from the site on the San Andreas fault producing a peak ground acceleration in rock of 0.071 g.

30. The average annual precipitation at the facility is 18.3 inches based on the Sacramento Executive Airport Station (approximately 5 miles north of the project site). About 86 percent of the precipitation occurs between October and March. The mean evapotranspiration is 50.48 inches per year as measured at the Fair Oaks, California Irrigation Management Information System Station.

31. The 100-year, 24-hour precipitation event for the facility is estimated to be 5.52 inches based on National Oceanic and Atmospheric Administration precipitation frequency estimates for the Sacramento Executive Airport dated August 27, 2014. The 100-year wet year was calculated to be 32.1 inches, based on data from the Department of Water Resources for the Sacramento Executive Airport Station.

32. The 1,000-year, 24-hour precipitation event for the facility is estimated to be 7.44 inches, based on National Oceanic and Atmospheric Administration precipitation frequency estimates for the Sacramento Executive Airport dated August 27, 2014.

33. The waste management facility is within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map #06067C0305H and #06067C0315H. The site is protected from flooding by a levee system that has crest elevations ranging from a minimum of 20.7-feet above mean sea level (msl) at the southwest corner of the treatment facilities to 22.0-feet above msl at the northeast corner of the treatment facilities. The perimeter levee system provides the entire treatment plant process area with protection from a 400-year flood event.

SURFACE WATER AND GROUNDWATER CONDITIONS

34. 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.

35. The site is on a low-lying alluvial basin at the confluence of Morrison, Beacon and Laguna Creeks. Currently, Morrison, Beacon, and Laguna Creeks converge on the north side of the property and drain westerly into the Beach-Stone Lakes Basin. The Beach-Stone Lakes Basin lies within the Morrison Creek, Cosumnes River and Mokelumne River watersheds as well as the Sacramento-San Joaquin Delta.

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

37. Two water-bearing zones have been identified beneath the site. The upper zone is referred to as the shallow saturated zone and is encountered between approximately 30 and 50 feet bgs. The second zone is referred to as the first aquifer and is encountered between approximately 60 and 75 feet bgs.

38. Based on the September 2013 measurements of groundwater elevation, the shallow aquifer has a potentiometric surface between approximately 87.5 and 102.5 feet above msl, and the first aquifer has a water table elevation between approximately 66.0 and 96.0 feet above msl using the site datum of 100 feet above msl.

39. Groundwater flow in the shallow aquifer is generally toward the east-southeast with a flow gradient of about 0.003 foot per foot based on the September 2013 groundwater contours prepared by the Discharger.

40. Groundwater flow is more complicated within the first aquifer because of the groundwater extraction pumping that occurs along the eastern margins of the DLDs. However, in general, groundwater in the first aquifer flows from the west to east under the DLDs to the extraction wells. East of the treatment plant, outside of the influence of the extraction wells, the first aquifer flows in an easterly direction.

41. Monitoring data from the 2014 Annual Report indicates background groundwater quality for each groundwater zone consists of TDS and EC ranges shown in Table 5 below.

Table 5 – Background 2014 EC and TDS Concentrations

Groundwater Zone	EC (micromhos/cm)	TDS (mg/L)
North Shallow	400 to 780	210 to 460
South Shallow	3,500 to 3,800	2,200 to 2,900
North First Aquifer	360 to 660	230 to 440
South First Aquifer	1,900 to 2,000	1,000 to 1,500

42. 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, UNSATURATED ZONE, AND SURFACE WATER MONITORING

43. The existing groundwater monitoring network for the SSBs, DLDs, and closed landfill consists of the background monitoring wells, extraction wells, and detection monitoring wells listed in Table 6 below and, as shown on Attachment C.

Table 6 – Existing Groundwater Well Network

Well	Status	Zone	Well Screen (feet bgs)	Area Being Monitored
MW-219R	Background	Shallow	30 to 45	North Side
MW-220	Background	Shallow	40 to 50	North Side
MW-221R	Background	Shallow	20 to 35	North Side
MW-223	Detection	Shallow	36 to 56	North Side
MW-226R	Detection	Shallow	30 to 45	North Side
MW-227R	Detection	Shallow	25 to 40	North Side
MW-228R	Detection/Extraction*	Shallow	29 to 44	North Side
MW-232	Detection	Shallow	32 to 45	North Side
MW-233	Detection/Extraction*	Shallow	32 to 47	North Side
MW-236	Detection/Extraction*	Shallow	37 to 47	North Side
MW-237	Detection	Shallow	35 to 50	North Side
MW-238	Detection	Shallow	29 to 39	North Side
MW-239	Detection	Shallow	33 to 43	North Side
MW-240	Detection	Shallow	33 to 42	North Side
MW-241	Detection	Shallow	30 to 40	North Side
MW-242	Detection	Shallow	32 to 42	North Side
MW-243	Detection	Shallow	33 to 42	North Side
MW-222R	Background	Shallow	15 to 30	South Side
MW-225	Detection	Shallow	40 to 50	South Side
MW-229R	Detection	Shallow	39 to 54	South Side
MW-235	Detection/Extraction*	Shallow	25 to 40	South Side
MW-301	Background	First Aquifer	62 to 72	North Side
MW-326	Background	First Aquifer	66 to 77	North Side
MW-303	Extraction*	First Aquifer	55 to 65	North Side
MW-305	Detection	First Aquifer	52 to 62	North Side
MW-306	Extraction*	First Aquifer	50 to 60	North Side
MW-310	Detection	First Aquifer	53 to 63	North Side
MW-311	Detection	First Aquifer	57 to 67	North Side
MW-312	Detection	First Aquifer	57 to 72	North Side
MW-313	Extraction*	First Aquifer	56 to 66	North Side
MW-314	Detection	First Aquifer	57 to 67	North Side
MW-315	Extraction*	First Aquifer	62 to 78	North Side
MW-318	Detection	First Aquifer	51 to 61	North Side
MW-319	Detection	First Aquifer	50 to 60	North Side
MW-320	Detection	First Aquifer	56 to 66	North Side
MW-322	Detection	First Aquifer	55 to 65	North Side
MW-323	Detection	First Aquifer	62 to 68	North Side
MW-324	Detection	First Aquifer	51 to 61	North Side
MW-328	Extraction*	First Aquifer	50 to 70	North Side
MW-329	Extraction*	First Aquifer	61 to 76	North Side

Table 6 – Existing Groundwater Well Network

Well	Status	Zone	Well Screen (feet bgs)	Area Being Monitored
MW-330	Extraction*	First Aquifer	63 to 78	North Side
MW-331	Extraction*	First Aquifer	61 to 76	North Side
MW-333	Extraction*	First Aquifer	49 to 70	North Side
MW-334	Extraction*	First Aquifer	58 to 73	North Side
MW-335	Detection	First Aquifer	55 to 65	North Side
MW-336	Detection	First Aquifer	55 to 65	North Side
MW-337	Detection	First Aquifer	65 to 75	North Side
MW-339	Detection	First Aquifer	55 to 65	North Side
MW-340	Detection	First Aquifer	55 to 65	North Side
MW-341	Detection	First Aquifer	65 to 75	North Side
MW-316	Background	First Aquifer	75 to 85	South Side
MW-307	Extraction*	First Aquifer	60 to 70	South Side
MW-308	Extraction*	First Aquifer	59 to 69	South Side
MW-309	Detection	First Aquifer	70 to 80	South Side
MW-317	Detection	First Aquifer	63 to 73	South Side
MW-321	Detection	First Aquifer	58 to 68	South Side
MW-325	Detection	First Aquifer	34 to 49	South Side
MW-332	Extraction*	First Aquifer	69 to 84	South Side
MW-338	Detection	First Aquifer	65 to 75	South Side
MW-106R	Detection	Unknown	9 to 19	North Side
MW-401	Irrigation/Other	Unknown	106 to 166	North Side
MW-404	Irrigation/Other	Unknown	353 to 373	South Side
MW-405	Irrigation/Other	Unknown	Unknown	South Side
MW-406	Irrigation/Other	Unknown	Unknown	South Side
MW-408	Irrigation/Other	Unknown	Unknown	South Side

* Extraction wells are part of the corrective action program and considered corrective action wells for monitoring requirements as specified in MRP R5-2015-XXXX.

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

45. Each L-DLD contains two LCRS sumps that gravity drain via underground pipes to one pump-station. The L-DLD pump-station locations are shown on Attachment D. The unsaturated zone monitoring system for the L-DLDs consists of a pan lysimeter located at the lowest areas of the L-DLD for a total of two pan lysimeters in each L-DLD as shown in Attachment D. The Discharger's detection monitoring program for the unsaturated zone for the L-DLD units meets the requirements contained in Title 27.

46. C-DLDs 1 and 5, SSBs, and the closed landfill do not have unsaturated zone monitoring devices.

47. No surface water monitoring is required because storm water runoff from both the DLDs and the closed landfill is collected in storm water basins and routed to the headworks of the wastewater plant for treatment. Storm water that flows into the SSBs either remains in the SSBs or gets routed to the headworks of the wastewater treatment plant for treatment.

48. The Discharger has not submitted a Sampling Collection and Analysis Plan (SAP) Report for this site, which includes sampling and analysis quality assurance/quality control standards. These WDRs require that the Discharger develop a SAP detailing the sampling collection and analysis procedures including quality assurance/quality control standards, as detailed in Provision H.

49. The Discharger submitted a Water Quality Protection Standard (WQPS) report proposing statistical data analysis methods to calculate concentration limits for groundwater in October 1992. The WQPS report proposed to use Interwell data analysis to calculate prediction limits for the monitored constituents. The WQPS does not include concentration limits for vadose zone monitoring and has not been updated to include additional monitoring data since 1992. These WDRs require that the Discharger develop a complete list of concentration limits for each unit and submit a WQPS Report describing the WQPS for each unit consistent with the requirements of this Order, as detailed Provision H.

GROUNDWATER CORRECTIVE ACTION

50. The Discharger has identified an increase in the concentration of inorganic constituents (salts) in samples from groundwater monitoring wells downgradient from the waste management units when compared to samples from upgradient groundwater monitoring wells. Soil pore-water monitoring also detected elevated inorganic constituents in the unsaturated zone beneath the DLDs. The increased inorganic concentrations consisted primarily of nitrate, chloride, and total dissolved solids.

51. During December 1995, the Discharger implemented a corrective action program to remediate groundwater impacts that consists of groundwater extraction from ten extraction wells at the downgradient edge of the DLDs. The intent of the program is to capture and remove nitrate and salt impacted groundwater. The extracted groundwater is discharged to the wastewater treatment plant secondary effluent or to the constructed wetlands under a NPDES permit R5-2010-0114-04. The Discharger expanded the corrective action program in 2000 with the addition of seven groundwater extraction wells. The new wells were expected to increase the overall groundwater pumping rate from 0.25 million gallons per day to approximately 1.0 million gallons per day. The flow rates were not as great as expected and some of the extraction wells did not have enough water for pumping. Subsequently, by 2008 all four of the shallow extraction wells (MW-235, MW-233, MW-236, and MW-228R) were shut down. Currently, the thirteen first aquifer extraction wells have an average pumping rate of approximately 0.4 million gallons per day. The Discharger evaluated processes for pollutant source control from the existing DLDs prior to closure. These processes include: (1) injecting

biosolids closer to the surface of the DLDs, (2) discing sooner to promote evaporation, and (3) regrading/rolling the DLDs prior to the winter to promote storm water runoff.

52. The Discharger lined or closed the DLDs to remediate the groundwater impacts from the DLDs. Liner installation for DLDs 2 and 4 was completed during 2002 and for DLD 3 in 2003. DLDs 1 and 5 were closed during 2004 with an ET cover and are not lined.

53. The R5-2003-0076 WDRs required a groundwater monitoring program to determine if leakage from the SSBs is occurring and impacting groundwater quality. The Discharger installed 6 monitoring wells in 2009 in the vicinity of the SSBs to collect the required data to assess the potential impacts of the SSBs on groundwater quality. The wells were sampled semi-annually beginning in August 2010 for the same constituents as the other on-site groundwater monitoring wells as specified in MRP R5-2003-0076.

54. Some of the recently installed groundwater wells downgradient of the SSBs have concentrations of TDS, nitrates and salts above background indicating that the SSBs may be impacting the groundwater. These WDRs require that the Discharger submit an antidegradation analysis to determine if groundwater degradation is being caused by the SSBs as detailed in Provision H.

DESIGN OF WASTE MANAGEMENT UNIT(S)

55. 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.

Closed Class III Landfill

56. Approximately 8 acres of the 23-acre landfill received grit, screenings, ash, and inert construction wastes. The landfill, closed in 1994, had a capacity of about 1.16 million cubic yards and it was estimated that approximately 36,000 cubic yards of waste was place within the 8 acres that was used. The landfill is covered by a 1-foot vegetative layer, a 1-foot thick low permeability layer, and a foundation layer with a minimum thickness of two feet.

57. The Discharger conducts landfill gas monitoring as required by CalRecycle and the Local Enforcement Agency (LEA). In February 2012, The LEA approved reducing the monitoring to three landfill gas wells to maintain 1,000 foot well spacing. Attachment E shows the locations of the current landfill gas monitoring wells GW-6, GW-9, and GW-10. The Discharger shall include copies of the CalRecycle landfill gas monitoring reports with the annual monitoring reports as specified in MRP R5-2015-XXXX.

Unclassified Solids Storage Basins

58. The eight Battery I SSBs were constructed in the mid 1970's underlain by silty clayey materials with permeabilities ranging from 10^{-4} to 10^{-7} cm/sec. The Battery I SSBs are each approximately 275 to 400 feet in width, 600 to 700 feet in length, and 12 feet deep.

59. The eight Battery II and four Battery III SSBs were constructed in the early 1980's underlain by silty clayey materials with permeabilities ranging from 10^{-6} to 10^{-8} cm/sec. The Battery II and III SSBs are each approximately 450 feet in width, 725 feet in length, and 15 feet deep.

60. Twenty SSBs receive about 6,000 tons of digested sludge (wet weight) per day for storage and stabilization. The sludge typically remains in the SSBs for three to five years. The SSBs are designed as facultative lagoons to control odors and to enhance sludge stabilization. Stored sludge is removed seasonally using a floating hydraulic dredge, which pumps the stabilized sludge to the DLDs.

61. In general, the SSBs receive inflows of digested sludge while supernatant and sludge are discharged and harvested from the SSBs. Digested sludge is discharged into the SSBs via one of two digested sludge pipes located at the bottom of each pond. Each SSB receives digested sludge based on a computerized control strategy that incorporates operator inputs to regulate the total volume into each SSB in sequential order. The operating levels in each SSB pond are maintained at 14.0 feet above msl with approximately 3.5 feet of freeboard at the level of the supernate outflow pipe. The Battery II and III SSBs are also equipped with overflow pipes (at 15.0 feet above msl) which provide approximately 2.5 feet of freeboard that discharge liquid to a metering structure and back to the wastewater treatment plant headworks as additional protection.

62. A typical water balance model has not been prepared because the Discharger's operational procedures provide protection against overfilling of the SSBs. Specifically, the Discharger controls maximum inflows of digested sludge to each SSB to prevent exceeding capacity. Additionally, the SSBs are hydraulically controlled with supernate discharge pipes that lead back to the wastewater treatment plant headworks. Finally, the Battery II and III overflow system provide additional emergency protection against overfilling while maintaining approximately 2.5 feet of freeboard. Based on the operational procedures and historical data, the Discharger reports that the SSBs have sufficient capacity to maintain two feet of freeboard.

63. This Order requires the SSBs to have capacity for wastewater flows to the SSBs, precipitation, and precipitation runoff from a 100-year wet year of 32.1 inches distributed at least monthly, and shall maintain at least two (2.0) feet of freeboard at all times, except during harvesting operations when the freeboard shall be maintained at a minimum of 1.5 feet, as detailed in Specification C and Provision H.

Class II Dedicated Land Disposal Units

64. There are five 40-acre DLDs that have received stabilized sludge (biosolids) from the SSBs. Discharge of biosolids will continue at L-DLDs. This Order allows C-DLDs to be converted to L-DLDs if the waste is removed and they receive liners as detailed in Specification D. Biosolids are applied to the L-DLDs as a semi-liquid (about 7% solids) by subsurface injection to the upper 6 to 8 inches. The biosolids are applied to the L-DLDs during the dry season (typically from May through October). The Discharger applies lime as needed to maintain the proper soil pH and prevent leaching of heavy metals. The L-DLDs are graded to prevent ponding.

65. Construction of L-DLDs will proceed only after all applicable design plans, specifications, and construction quality assurance plans have been approved by Executive Officer.

66. Title 27 §20250 states that the maximum depth of a Class II LTU treatment zone shall not exceed 5 feet from the initial soil surface. The site specific soil conditions and waste characteristics indicate that the upper five feet would not achieve the performance goals of §20250 for the degradation, immobilization and transformation of nutrients and salts. However, it was initially thought that the deeper soils, in the deep percolation zone, would meet the performance goals of §20250 and would protect against water quality impairment. Pursuant to §20080 of Title 27, the DLDs were considered engineered alternative LTUs for the five-foot treatment zone prescriptive standards under Regional Board Order 90-151. Subsequent monitoring demonstrated that the nutrients and salts are readily transported through the unsaturated zone to groundwater. To remediate the impacts to groundwater, WDR R5-2003-0076 required the DLDs to be closed or lined.

DLD Liner Systems

67. Pursuant to §20435(r)(2) of Title 27, the Discharger lined DLDs 2, 3 and 4 due to groundwater impacts. Prior to lining a DLD, the Discharger excavated existing biosolids waste and native soil to a depth of about five-feet. The liner was then constructed, and the soil and biosolids placed on the liner system. The DLD liner system, from top to bottom, is as follows:

    a. an LCRS consisting of 12-inches of 3/8-inch pea gravel, filter fabric and drainage piping;

    b. a 60-mil HDPE geomembrane;

    c. native clayey soils that have been moisture conditioned and compacted;

    d. two LCRS sumps connected via underground pipes to one pump-station per each L-DLD; and

e. two pan lysimeters underlying pipe penetrations of the liner which are the lowest points in the LCRS.

68. Title 27 section 20370(a) requires Class II units to be designed to withstand the maximum credible earthquake (MCE) without damage to foundation or containment structures. The Discharger did not submit a stability analysis for the L-DLDs. As an alternative, a 1995 stability analysis for a nearby biosolids recycling facility was submitted as the stability analysis. The Discharger determined that for the L-DLDs no additional stability analyses were required as detailed in the 2002 ROWD.

69. The Discharger submitted a Construction Quality Assurance program for lining DLDs 2 through 4 requiring the native soils to be fine-grained soils with significant clay content that are SC, CL or CH per the Unified Soil Classification System and that visual classification would be conducted on a 100-foot horizontal grid. Any area of soil that was not classified as SC, CL or CH was excavated to a depth of one-foot and replaced by fine-grained clayey soils. Laboratory testing for particle size distribution, Atterberg Limits and moisture-density were also conducted. Liner system installation was completed for DLDs 2 and 4 during 2002, and in 2003 for DLD 3.

70. The Discharger also lined the DLD storm water runoff areas (runoff zones) that are adjacent to each of the DLDs. A low area of about 5-acres exists adjacent to each of the approximately 40-acre DLDs where storm water is collected and gravity drained to a sanitary sewer and routed back to the treatment plant headworks. The Discharger lined each of the runoff zones adjacent to the DLDs using a 45-mil polypropylene geomembrane. The lined runoff zone areas can contain storm water runoff from a 1,000-year, 24-hour storm event as reported in the 2002 ROWD.

71. The runoff zones are equipped with pipes that that can discharge runoff from a 10-year, 24-hour storm event. During an extreme event in 1995, the Discharger reported that runoff backed up into the runoff zone areas to a depth of 2 to 3 feet for a period of about 24-hours. The Discharger reported that gates controlling the runoff zone outlets are not closed as an operational practice, even during large storm events. The Order allows these gates to be closed to minimize flows to the treatment plant headworks under an emergency situation when operations staff may deem it necessary for the protection of public safety or property, or preservation of the facility equipment. These emergency situations would be when upstream overflows or public damage is likely, or if simultaneous failures of treatment plant influent pumps and/or process units occur that require immediate cutback in plant flow. The 45-mil polypropylene liner will significantly reduce any percolation of DLD storm water runoff in the runoff zones during times when storm water backs up into them. The runoff zones for DLDs 2 and 4 were lined during 2002, and DLD 3 was lined in 2003.

72. Each L-DLD has an unsaturated zone monitoring system consisting of a pan lysimeter located at the lowest areas of the L-DLD for a total of two lysimeters per L-DLD. In 2004 and 2006, leaks were discovered in L-DLD 3SW, L-DLD 3SE, and L-DLD 4NW. The

Discharger investigated these leaks and concluded that the LCRS pipe boot was leaking into the lysimeter at L-DLD 3SW and L-DLD 3SE. Additionally, a portion of the primary and lysimeter liner systems were not welded together at L-DLD 4NW. The Discharger repaired the leak at L-DLD 4NW, but not at L-DLD 3SW and L-DLD 3SE because it could potentially cause more damage to excavate the pipe boot for repairs causing the repairs to not be successful. The Discharger monitors the water levels in the lysimeters, periodically removes the water, and reports the quantities of liquids removed in the semi-annual monitoring reports.

73. The WDRs Order 98-087 required the Discharger to maintain DLD soil pH above 6.5 in order to prevent heavy metals from solubilizing from the DLD soils. The Discharger proposed a reduction in the required pH limit to 5.0, with a target operating range of 5.2 to 5.5. The Discharger has reported that research on biosolids amended soils has shown that metals solubility is influenced to a greater extent by cation exchange capacity and organic matter content than by pH, and that metals in biosolids are complexed with organic compounds which greatly reduces solubility and inhibits migration from the treatment zone. As a result, the Discharger reports that they do not anticipate substantial metals migration at the reduced pH. In order to assess whether the pH reduction is increasing the solubility of metals, the Discharger proposes to monitor metals concentrations in the infiltrate (leachate) and perform an annual trend analysis. Order 5-01-263 approved a reduced DLD soil pH limit of 5.0, but allowed Executive Officer to require an increase in the DLD soil pH if Regional Board staff finds that the trend in soluble metals concentrations in the leachate is increasing. This Order continues this requirement. Trend analysis results shall be reported in the annual monitoring report, per MRP R5-2015-XXXX.

Closure of DLDs 1 and 5

74. The Discharger closed C-DLDs 1 and 5 to address groundwater impacts from the unlined DLDs in 2004.

75. Closure requirements for Land Treatment Units are given in §21420 of Title 27, which states:

> *"During the closure and post-closure period, the discharger shall:*
> *(1) continue all operations necessary to maximize degradation, transformation, or immobilization of waste constituents within the treatment zones;*
> *(2) continue all ground water and unsaturated zone monitoring in compliance with Article 1, Subchapter 3, Chapter 3, Subdivision 1 of this division (§20380 et seq);*
> *(3) continue all operations of the treatment zones to prevent runoff of waste constituents; and*
> *(4) maintain the precipitation and drainage control systems."*

The Class II performance standard is given in §20310(a) of Title 27, which states:

"Class II waste management units (Class II "Units") shall be designed and constructed to prevent migration of wastes from the Units to adjacent geologic materials, ground water, or surface water, during disposal operations, closure, and the post-closure period."

The closure requirements given by this Order for C-DLDs 1 and 5 are intended to meet the LTU closure requirements given in §21420 of Title 27 and the performance standard given in §20310(a) of Title 27.

76. The Discharger submitted a Final Closure and Post-Closure Maintenance Plan for the C-DLDs 1 and 5 in December 2002, pursuant to Title 27 §21769.

77. The December 2002 amended ROWD submitted by the Discharger states that the proposed closure for DLDs 1 and 5 is an engineered alternative to the prescriptive requirements of Title 27. Title 27 provides a prescriptive requirement for closure of solid waste landfills under §21090; however, Title 27 does not provide a prescriptive requirement for closure of a land treatment unit. Despite this, the Discharger provided a demonstration in the amended ROWD showing that the proposed closure for DLDs 1 and 5 meets or exceeds the performance of a prescriptive final cover for a solid waste landfill as would be required under §20080 for an engineered alternative to the prescriptive requirement. This demonstration provides the required information for the closure requirements for LTUs pursuant to §21420 of Title 27 quoted in Finding 75, above.

78. A stability analysis was not provided for the C-DLDs because the closed DLD final cover slopes are less than 3H:1V.

79. The Discharger closed C-DLDs 1 and 5 using an evapotranspirative (ET) cover and lined the runoff zones using a 45-mil polypropylene liner as described in Findings 70 and 71. The ET cover consisted of vegetating existing DLD 1 and 5 soils. The cover was graded to drain by increasing existing slopes to a nominal 1 percent (%). Runoff from the final cover would continue to be captured and routed to the treatment plant headworks. The primary mechanism of an ET cover for minimizing infiltration of rainwater is uptake of moisture by evaporation and plant transpiration. The vegetation for the final cover originally consisted of a mixture of various grasses and forbs listed in Table 7 and was changed in 2012 (See Finding 86).

Table 7 – C-DLD Cover System Vegetation Plant Species

Common Name	Scientific Name	Persistence
Triticale	Triticum aestivum X Secale cereal	Annual
Creeping red fescue	Festuca ruba ssp. Rubra	Perennial
California brome	Bromus carinatus	Perennial
California barley	Hordeum californicum	Perennial
Purple needlegrass	Nassella pulchra Stipa pulchra	Perennial
Tall wheatgrass	Agropyron elongatum Elytrigia pontica	Perennial
Blue wildrye	Elymus glaucus	Perennial
Perennial ryegrass	Lolium perenne	Perennial

80. The final grading design for DLDs 1 and 5 utilized a “saw-tooth” design to provide the nominal 1% slope for drainage. The general objectives for development of the final grading design as stated by the Discharger are:

    a. Minimize infiltration to reduce contaminant migration;

    b. Promote runoff and prevent ponding;

    c. Control erosion; and

    d. Comply with applicable regulations.

81. The Discharger performed computer modeling to predict how much infiltration would pass through the 10-foot treatment zone at DLDs 1 and 5 after they are closed with the proposed final cover. The Discharger used geological and constituent concentration data in the modeling that was collected from four soil borings advanced at DLDs 1 and 5 during 2001. The geology and constituent concentrations were known at several depth intervals both within and beneath the 10-foot treatment zone. The infiltration performance was estimated using the UNSAT-H computer program. Input parameters included 30 years of rainfall data during the wettest 30-year period (1954-1983), vegetation data, and soil property data. Infiltration at the bottom of the treatment zone (10-foot depth) was calculated to be 0.008 centimeters per year (cm/yr). For comparison, the Discharger also modeled the performance of a Title 27 prescriptive final cover for a landfill. The predicted infiltration for this cover was 0.6 cm/yr. Finally, the Discharger estimated that the infiltration for DLDs 1 and 5 during historical operations was 13.4 cm/yr.

82. The Discharger also performed computer modeling to predict the impact to groundwater that would result from the predicted infiltration through the proposed final cover. The Discharger used the MULTIMED computer program. The modeling predicted no impacts

to groundwater at the point-of-compliance (downgradient edge of the units) through a period of 5,000 years.

83. The DLD soil monitoring conducted by the Discharger indicates high levels of nitrate as nitrogen, especially in the upper 2 to 3 feet. Nitrate as nitrogen has been the primary constituent-of-concern to drive corrective action activities at the facility due to high concentrations in the waste, and groundwater impacts above the primary maximum contaminant level of 10 milligrams per liter. The Discharger predicted that significant de-nitrification of the DLD soils will occur in the first several years after closure. Water quality data from eight lysimeters set at depths of 10 and 15 feet below the ground surface at the four monitoring stations showed that the constituent concentrations (nitrate, phosphate, sulfate, chloride, and electrical conductively) remained relatively stable since the DLD 1 and 5 ET covers were installed in 2004, as detailed in the 2010 Action Level Report.

84. The Discharger predicted that the vegetation planted directly in the C-DLD soils will uptake salts and nitrates. The Discharger annually harvests and removes the vegetation. The purpose of the harvesting is to permanently remove salts and nitrates from the DLD soils, thereby reducing their threat to water quality. The Discharger conducts annual plant tissue analyses on the harvested biomass to determine the available disposal or beneficial reuse options. The Discharger has estimated that approximately 60,000 pounds of dry biomass material is removed from each C-DLD annually.

85. A plant community assessment in 2008 revealed that most of the existing plants were not those originally planted during closure. Only two of the original eight plant species (Table 7) were identified on the C-DLDs. Additionally, observations within 6 test pits showed that a majority of the root depths fell in the top 6 inches of soil, with the Tall Wheat Grass having the deepest roots at 17 inches. The shallow root depths cannot pull moisture from deeper soils in the ET cover. Furthermore, in 2010, an additional vegetation survey indicated that only 4% of the vegetation consisted of the original plant species.

86. The Discharger utilized two different seed mixes to reseed two 10-acre test plots to revegetate C-DLDs 1 and 5 final cover from fall 2010 through spring 2011. Based on the results of test plots, the remaining C-DLD cover areas were revegetated in November 2012 with a seed mix composed of Tall wheatgrass, Perennial rye, California brome, and Slender wheatgrass. The Discharger established the target vegetative cover through the application of broadleaf specific herbicides to reduce competition with broadleaf weeds and utilized haying practices (cutting, baling and removing) to promote the target perennial grass species while discouraging less desirable annual grasses and broadleaf weeds.

87. A May 2013 vegetation survey indicated healthy seed germination and substantial first season growth. During a subsequent vegetation survey in June 2014, roots were

observed throughout the test pits to depths of 37-inches and 48-inches. Additionally, the percent cover of target species in C-DLDs 1 and 5 were 108% and 60%, respectively. The June 2014 vegetation report concluded that the high absolute percent cover of target species achieved in less than 2 years following the reseeding effort is encouraging. The Discharger will continue weed control measures at C-DLDs 1 and 5 to reduce the occurrence of non-target species. Based on the results of the assessments, the Discharger will continue using the plant species listed in Finding 86 (Tall wheatgrass, Perennial rye, California brome, and Slender wheatgrass) and regularly inspecting the C-DLDs to remove non-target plant species for the C-DLDs 1 and 5 cover systems.

88. During the initial 8-years after closure, the Discharger collected data to determine the performance of the closure after the vegetative cover had been fully established. The Discharger proposed to develop action levels for infiltration and contaminant migration that would be used to determine when mitigation measures might be required to further reduce contaminant migration.

89. The Discharger submitted an *Action Level Report for DLD Units 1 and 5* in February 2010. The report concluded that it was not possible to correlate the neutron probe data with the soil core measurements due to an unexpectedly high degree of heterogeneity of the soil and recommended an additional 3 year monitoring period to further assess the final cover performance to develop the Final Action Levels. Staff approved the request for extended monitoring in a letter dated 14 September 2010.

90. The Discharger submitted a *Final Action Level Report for DLD Units 1 and 5* in July 2013 proposing to calculate water storage within the upper 15 feet of the waste in each DLD and compare the estimated water storage values to the proposed Final Action Levels. The proposed Final Action Levels consisted of the 95% percent upper tolerance limits of the 2010 to 2013 water storage estimates within the upper 15 feet of the waste. In a letter dated 16 August 2013, staff were concerned that the proposed methodology does not have a mechanism for monitoring contaminant migration. These WDRs require the Discharger to prepare a Revised Final Action Level Report that addresses contaminant migration, as detailed in Provision H.

91. The Final Post-Closure Monitoring Report submitted by the Discharger specifies monitoring of the performance of the DLD closure during the post-closure maintenance period. The current Final Post-Closure Monitoring Report specifies monitoring that consists of monitoring:

    a. Two monitoring points installed at C-DLD 1 and C-DLD 5 (four total). Each monitoring station would also include two suction lysimeters to monitor soil pore liquid installed to depths of 10 and 20 feet bgs.

    b. C-DLD soil moisture at various depths using neutron probe logging in the upper 20 feet.

Based on subsequent information submitted by the Discharger the proposed method to monitor the closure cover by utilizing neutron probes is unreliable because of the high degree of heterogeneity of the soil. Current closure C-DLD monitoring consists of collecting C-DLD soil samples semi-annually at each monitoring station for laboratory analysis of moisture. These WDRs require the Discharger to revise the Final Post-Closure Maintenance Plan with the updated post-closure monitoring system and the Revised Final Action Levels, as detailed in Provision H.

92. The Discharger submitted a document entitled Mitigation Alternatives for Closure Design (Mitigation Plan) in Appendix G of the December 2002 amended ROWD. This document proposes ways to mitigate problems with the closure of DLDs 1 and 5 from failure to establish adequate vegetation, destruction of vegetation by fire, and unfavorable soil chemistry. Proposed mitigation measures include planting of salt tolerant woody species and addition of organic matter to soil. This Order requires the Discharger to implement the mitigation measures proposed in the Mitigation Plan if the C-DLD vegetation is inadequate. The Discharger shall report in the adequacy of the C-DLD vegetation in the annual monitoring report, per MRP R5-2015-XXXX.

CLEAN CLOSURE AND CLOSURE FINANCIAL ASSURANCES

93. The Discharger proposes to clean-close the SSBs, provide an ET closure cover for the L-DLDs, continue post-closure monitoring for C-DLDs 1 and 5, provide post-closure monitoring for the L-DLDs when closed, and continue post-closure monitoring for the closed landfill, as detailed in the 2015 Annual Closure Plan Updates. The Discharger may clean-close all or a portion of the closed landfill as part of the EchoWater Project, and will revise the financial assurances as appropriate.

94. An itemized cost estimate for third party costs to clean-close the SSBs, provide a closure cover for the L-DLDs 2 to 4, provide post-closure monitoring for the C-DLDs and L-DLDs, and continue post-closure monitoring for the closed landfill is included in the 2015 Closure Plan Updates. The total of the estimate is $23,267,184 in 2015 dollars, as shown on the table below. This cost estimate is approved by the adoption of these WDRs. Pursuant to Title 27 Section 22207(a), this Order requires the Discharger to establish financial assurances for these activities, with exception of the SSBs, in accordance with the approved cost estimate naming the Central Valley Water Board as the beneficiary. The SSBs are exempt from Title 27; however, this Order requires the Discharger to establish financial assurances for the clean-closure of the SSBs in accordance with the approved cost estimate naming the Central Valley Water Board as the beneficiary. The current balance of the Enterprise Fund mechanism for closure and post-closure is $8,343,897. The landfill and C-DLD post-closure costs are fully funded. Annually the Discharger makes minimum payments to the Enterprise Fund for the SSB closure and L-DLD closure and post-closure equal to the closure and post-closure cost estimate divided by the active life of the SSBs and L-DLDs that is estimated to be 50 years. The Enterprise Fund will be fully funded for SSB closure and L-DLD closure and post-closure at the end of the estimated active life of the SSBs and L-DLDs.

Table 8 – 2015 Financial Assurances Estimate

Unit	Activity	2015 Dollars
Solids Storage Basins	Clean Closure	$10,379,891
Lined Dedicated Land Disposal Units 2 to 4	Closure Evapotranspirative Cover	$1,655,255
Lined Dedicated Land Disposal Units 2 to 4	Post-Closure (including groundwater CAP)	$9,560,808
Closed Dedicated Land Disposal Units 1 and 5	Post-Closure	$1,570,266
Closed Class III Landfill	Post-Closure	$100,964
Total	**Closure and Post-Closure**	**$23,267,184**

FINANCIAL ASSURANCES FOR CORRECTIVE ACTION

95. Title 27 section 22222 requires the Discharger to establish financial assurances for corrective action of a known or reasonably foreseeable release. A cost estimate for corrective action was submitted on 7 March 1995 to account for groundwater impacts from a release from a treatment unit and a limited release from a dike. The total cost estimate for corrective action is $2,199,695 in 2015 dollars. The existing Enterprise Fund for corrective action costs is fully funded. The costs associated with operations and maintenance of the existing groundwater corrective action program associated with the DLDs is included in the L-DLD post-closure cost estimate. This cost estimate is approved by the adoption of these WDRs. This Order requires the Discharger to establish financial assurances for corrective action in accordance with the approved cost estimate naming the Central Valley Water Board as the beneficiary. This Order also requires annual adjustments to account for inflation by 1 June of each year.

CEQA AND OTHER CONSIDERATIONS

96. The action to revise WDRs for these waste management facilities 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. The County of Sacramento, Department of Environmental Review determined the project for closure of DLDs 1 and 5 to be Categorically Exempt from the provisions of CEQA. A Notice of Exemption dated 14 January 2003 for the closure project was filed with the County of Sacramento County Clerk. A copy of the Notice of Exemption has been placed in the December 2002 amended Report of Waste Discharge submitted by the Discharger.

98. This order implements:

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

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

99. Based on the threat and complexity of the discharge, the facility is determined to be classified 1-A as defined below:

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

    b. Category A complexity, defined as, “Any discharge or toxic wastes; any small volume discharge containing toxic waste; any facility having numerous discharge points and groundwater monitoring; or any Class 1 waste management unit.”

100. Water Code section 13267(b)(1) provides that, in part: "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...”

101. The technical reports required by this Order and the attached "Monitoring and Reporting Program R5-201X-XXXX" 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

102. 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.

103. 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.

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

IT IS HEREBY ORDERED, pursuant to California Water Code sections 13263 and 13267, that Order R5-2003-0076 is rescinded except for purposes of enforcement, and that Sacramento Regional County Sanitation District, 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

General Prohibitions

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

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

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

4. The discharge of wastes which have the potential to reduce or impair the integrity of containment structures or which, if commingled with other wastes in the units, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products which in turn:
    a. require a higher level of containment than provided by the unit,
    b. are 'restricted hazardous wastes', or
    c. impair the integrity of containment structures, is prohibited.

5. The Discharger shall comply with all Standard Prohibitions listed in Section C of the SPRRs dated November 2013. Provision H.1 references the SPRRs in entirety. Violation of Section C of the SPRRs constitutes being out of compliance with Prohibition A.5 and not Provision H.1.

Closed Class III Landfill

6. The discharge of new waste to the landfill is prohibited.

Unclassified Solids Storage Basins

7. The bypass and over flow of waste discharged to the SSBs, prior to being discharged to the L-DLDs, is prohibited.

Class II Dedicated Land Disposal Units

8. The discharge of waste in any form to the L-DLDs when the soil is saturated is prohibited.

9. The discharge of 'non-hazardous solid waste', including screenings and grit, not associated with the biosolids disposal operation, to the DLDs is prohibited. For the purposes of this Order, the term 'non-hazardous solid waste' is as defined in Title 27.

10. The discharge of wastes to C-DLDs is prohibited unless the biosolids and other waste materials are removed from the C-DLD and a liner is installed to convert the C-DLD to a L-DLD as detailed in Specification D.

B. DISCHARGE SPECIFICATIONS

General Specifications

1. The discharge shall not cause a condition of pollution or nuisance as defined by Water Code section 13050.

2. Prior to the discharge of waste to a Class II waste management unit, all wells within 500 feet of the unit shall have sanitary seals or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Central Valley Water Board and to the State Department of Water Resources.

3. The Discharger shall comply with all Standard Discharge Specifications listed in Section D of the SPRRs dated November 2013. Provision H.1 references the SPRRs in entirety. Violation of Section D of the SPRRs constitutes being out of compliance with Discharge Specification B.3 and not Provision H.1.

Unclassified Solids Storage Basins

1. The discharge of liquid and semi-solid waste to the SSBs is limited to digested sludge, secondary effluent from the Regional Plant, filtrate/centrate, thickener effluent, return flow from the BRF and freshwater. However, chemicals for treatment or other wastes may be discharged to the SSBs after written approval by the Executive Officer.

2. Operation of the SSBs shall not result in odor nuisance conditions and shall not result in the degradation of underlying groundwater.

Class II Dedicated Land Disposal Units

3. Biosolids injected on the L-DLDs shall be covered within 24-hours after application if it poses an odor and/or vector nuisance.

4. If odor conditions result from discing at the L-DLDs, discing shall be discontinued until the disposal units sufficiently dry and/or critical odor transport conditions are no longer present.

5. The pH of the zone of incorporation (the upper 5 feet) of the L-DLDs shall be maintained at or above 5.0 pH units. The pH limit may be increased by the Executive Officer if Regional Board staff finds that the concentration of dissolved metals is increasing in the DLD leachate.

C. FACILITY SPECIFICATIONS

General Specifications

1. Annually, prior to the anticipated rainy season but no later than **15 November**, any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed and reported in compliance with MRP R5-201X-XXXX.

Unclassified Solids Storage Basins

2. The SSBs shall have capacity for wastewater flows to the SSBs, precipitation, and precipitation runoff from a 100-year wet year of 32.1 inches distributed monthly in accordance with historical rainfall patterns, and shall maintain at least two (2.0) feet of freeboard at all times, except during harvest operations. During harvest operations the Discharger shall maintain at least 1.5 feet of freeboard in the SSBs.

3. The Discharger shall **immediately** notify Central Valley Water Board staff by telephone and email and **immediately** take measures to regain SSB capacity in the event that freeboard levels are equal to or less than 2.0 feet during normal operations or 1.5 feet during harvest operations.

4. Any direct-line discharge to a SSB shall have fail-safe equipment or operating procedures to prevent overfilling.

5. The SSBs shall be designed, constructed and maintained to prevent scouring and/or erosion of the liners and other containment features at points of discharge to the impoundments and by wave action at the water line.

6. Solids that accumulate in the SSBs shall be periodically removed to maintain minimum freeboard requirements and to maintain sufficient capacity for supernate and the

discharge of wastes. Prior to removal of these solids, samples shall be collected for their characterization and classification in compliance with MRP R5-201X-XXXX.

Class II Dedicated Land Disposal Units

7. The Discharger shall operate and maintain the DLDs to maximize the degradation, transformation, and immobilization of waste constituents.

8. The surface of the DLDs shall be graded, smooth and free from significant depressions to encourage runoff and to prevent ponding.

9. DLD runoff zones shall be provided with a minimum 45-mil polypropylene geomembrane (or other equivalent) liner prior to any restriction or control gate closure that would detain storm water in the runoff zone.

10. The gates that control flow out of the DLD runoff zones shall not be closed except in an emergency situation as described in Finding 71 and shall be immediately opened once the emergency situation has passed.

11. Testing of the LCRS in each L-DLD shall be conducted annually to demonstrate that the LCRS is not clogged and is capable of transmitting all leachate to the sump. Results of the testing shall be reported in the Annual Monitoring Report as specified in MRP R5-2015-XXXX.

12. Each L-DLD pan lysimeter shall be monitored in accordance with MRP R5-2015-XXXX.

13. If liquids detected in a L-DLD pan lysimeter are determined to be from a leak in the containment structures, the Discharger shall:

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

    b. **Immediately** stop biosolids applications on the side of the L-DLD associated with that lysimeter until the leak is repaired.

    c. Remove liquid from the pan lysimeter on a regular basis until the repairs are completed.

    d. **Immediately** sample and test the liquid in accordance with the unsaturated zone monitoring requirements in MRP R5-201X-XXXX.

    e. Submit written notification of the release to Central Valley Water Board staff within **seven days** including a time schedule to repair the containment structures.

    f. Complete repairs of the containment structures in accordance with the approved time schedule.

14. In the event that liquid detected in any pan lysimeter is shown to be leachate by comparison with liquids in the sump, then biosolids applications shall cease on the side of the L-DLD associated with that lysimeter until the leak is repaired. The liquid shall be removed from the pan lysimeter on a regular basis until the repairs are completed. An Evaluation Monitoring Program shall also be prepared in accordance with the Standard Provisions and Reporting Requirements to assess whether the release has impacted the underlying unsaturated zone or groundwater.

15. The Discharger shall comply with all Standard Facility Specifications listed in Section E of the SPRRs dated November 2013. Provision H.1 references the SPRRs in entirety. Violation of Section E of the SPRRs constitutes being out of compliance with Facility Specification C.15 and not Provision H.1.

D. DESIGN AND CONSTRUCTION SPECIFICATIONS

General Specifications

1. Containment structures and precipitation and drainage control systems shall be constructed and maintained to prevent, to the greatest extent possible, inundation, erosion, slope failure, and washout under 1,000-year, 24-hour precipitation conditions for Class II waste management units and 100-year, 24-hour precipitation conditions for Class III waste management units.

2. Waste management units shall be designed, constructed and operated to prevent inundation or washout due to flooding events with a 100-year return period.

3. Surface drainage from wastewater treatment plant tributary areas and wastewater treatment plant internal site drainage from surface or subsurface sources shall not contact or percolate through wastes.

4. The Discharger shall comply with all Standard Construction Specifications listed in Section F of the SPRRs dated November 2013. Provision H.1 references the SPRRs in entirety. Violation of Section F of the SPRRs constitutes being out of compliance with Design and Construction Specification D.4 and not Provision H.1.

5. The Discharger shall comply with all Storm Water Provisions listed in Section L of the SPRRs dated November 2013. Provision H.1 references the SPRRs in entirety. Violation of Section L of the SPRRs constitutes being out of compliance with Design and Construction Specification D.5 and not Provision H.1.

Unclassified Solids Storage Basins

6. This Order allows modification to the SSBs to implement BPTCs following written Executive Officer approval of a design report including plans, specifications, and a construction quality assurance plan.

Class II Lined Dedicated Land Disposal Units

7. C-DLDs 1 and 5 may be converted to active L-DLDs using similar procedures to L-DLD 2 to 4 as detailed in Finding 67. Prior to lining a DLD, the Discharger shall excavate existing biosolids, waste materials, and native soil to a minimum depth of five-feet. Unless analytical testing results prove otherwise, the materials excavated from C-DLD 5 are considered designated waste and must be handled accordingly. Excavated materials removed from the C-DLD 5 footprint shall be stored in a Lined DLD (L-DLD 2, 3, or 4). Detailed excavation and stockpile plans shall be included in the design plans. Excavation of C-DLDs will proceed only after all applicable design plans, specifications, and construction quality assurance plans have been approved by Executive Officer.

8. Subgrade soils 1-foot below the liner system shall consist of fine-grained soils with significant clay content that are SC, CL or CH per the Unified Soil Classification System. Visual classification of the subgrade shall be conducted on a 100-foot horizontal grid. Any area of soil that was not classified as SC, CL or CH shall be excavated to a depth of one-foot and replaced by fine-grained clayey soils.

9. The DLD liner systems shall be constructed, at a minimum, with components listed below, from top to bottom:

    a. an LCRS consisting of 12-inches of 3/8-inch pea gravel, filter fabric and drainage piping;

    b. a 60-mil HDPE geomembrane;

    c. 1-foot thick layer of clayey soils that have been moisture conditioned and compacted;

    d. LCRS sumps and sump pumps; and

    e. two pan lysimeters underlying pipe penetrations of the liner which are the lowest points in the LCRS.

10. The LCRS for the L-DLDs shall be designed, constructed, and maintained to transmit twice the maximum anticipated daily volume of leachate to the sump without clogging and to prevent the buildup of hydraulic head on the underlying liner at any time. The LCRS pump shall be capable of removing this volume of leachate.

11. The depth of the fluid in any LCRS sump shall be kept at the minimum needed for safe pump operation without excessive pump cycling that could damage the pump.

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

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

14. DLD runoff zones shall be lined with a minimum 45-mil polypropylene liner during construction of DLD liner systems or during closure of unlined DLDs, as applicable.

15. The receiving surface for the HDPE layer of the DLD liner systems shall be flat rolled to be smooth and shall be free from significant organic material or any stones that protrude above the surface.

16. The Discharger may propose changes to the liner system design prior to construction, provided that approved components are not eliminated, and the engineering properties of the components are not substantially reduced. The proposed changes may be made following written approval by the Executive Officer.

17. The construction of the L-DLDs shall be under the direct supervision of a California registered civil engineer or certified engineering geologist.

18. The Discharger shall submit a design report including plans, specifications, and a construction quality assurance plan for review and approval prior to constructing any new L-DLD.

19. The Discharger shall submit a Construction Quality Assurance (CQA) Plan to the Regional Board for approval by Regional Board staff at least 90-days prior to construction of any L-DLDs. The CQA Plan shall include specifications for moisture conditioning and compaction of the soil underlying the HDPE geomembrane layer as well as minimum testing requirements.

20. Following the completion of construction of a L-DLD or portion of a L-DLD, and prior to discharge onto the newly constructed liner system, the final documentation required in §20324(d)(1)(C) of Title 27 shall be submitted to the Regional Board for review and approval. The report shall be certified by a California registered civil engineer or a

certified engineering geologist. It shall contain sufficient information and test results to verify that construction was completed in accordance with the design plans and specifications, with the requirements of this Order, and with the performance goals of Title 27.

21. A third party independent of both the Discharger and the construction contractor shall perform all of the construction quality assurance monitoring and testing during the construction of a liner system.

22. Closure of L-DLDs shall only proceed after adoption of closure waste discharge requirements that include findings and specifications that are written in accordance with the Discharger's demonstration that the proposed closure method will protect water quality.

E. CLOSURE AND POST-CLOSURE MAINTENANCE SPECIFICATIONS

General Closure Specifications

1. The closure of the waste management facilities, including the SSBs and DLDs, shall be under the direct supervision of a California registered civil engineer or certified engineering geologist.

2. The closure of each unit of all facilities shall be provided with at least two permanent monuments, installed by a licensed land surveyor, from which the location and elevation of all wastes, containment structures, and monitoring facilities can be determined throughout the post-closure maintenance period.

3. The Discharger shall continue to monitor groundwater and the vadose zone per MRP R5-2015-XXXX throughout the post-closure maintenance period.

4. The post-closure maintenance period shall continue until the Regional Board determines that remaining wastes in the DLDs, landfill, and SSBs do not threaten water quality.

Class III Landfill Closure and Post-Closure Maintenance

5. The closed landfill shall be maintained with a final cover consisting, at a minimum, of a two-foot thick foundation layer which may contain waste materials, overlain by a one-foot thick clay cover that has an hydraulic conductivity of no more than $1x10^{-6}$ cm/sec, and finally by a one-foot thick vegetative soil layer.

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

7. The closed landfill shall be graded to at least a three percent grade and maintained to prevent ponding.

8. Landfill gas monitoring shall be conducted per CalRecycle and the Local Enforcement Agency requirements. Copies of the landfill gas monitoring reports shall be submitted to the Regional Board with the annual monitoring reports as specified in MRP R5-2015-XXXX.

9. The Discharger may submit a work plan to clean-close the landfill for Regional Board approval pursuant to Title 27, Section 21090(f). Clean-closure may only proceed following written approval by the Executive Officer.

10. The Discharger shall comply with all Closure and Post-Closure Maintenance Specifications listed in Section G of the SPRRs dated November 2013. Provision H.1 references the SPRRs in entirety. Violation of Section G of the SPRRs constitutes being out of compliance with Closure and Post-Closure Maintenance Specification E.10 and not Provision H.1.

Unclassified Solids Storage Basins

11. At closure of the SSBs, the Discharger shall clean-close the SSBs. All residual wastes, including liquids, sludges, precipitates, settled solids, liner materials and adjacent natural geological materials contaminated by wastes shall be completely removed and discharged to an appropriately permitted landfill facility. If after reasonable attempts to remove contaminated natural geologic materials, the Discharger demonstrates that removal of all remaining contamination is infeasible, then the units shall be closed as a landfill. In this event, the Discharger shall backfill and grade the area and submit a revised Final Closure and Post-Closure Maintenance Plan proposing a final cover meeting the requirements of Title 27 section 21090 and shall perform all post-closure maintenance in the approved Post-Closure Maintenance Plan.

12. The Discharger shall submit a work plan for clean-closure of the SSBs a minimum of 90 days prior to clean-closure of the SSBs for Executive Officer approval.

Class II Dedicated Land Disposal Units

13. At closure and during post-closure period for the DLDs, the Discharger shall, pursuant to Title 27 section 21420, perform the following:

    a. Install a final evapotranspirative cover system consisting of vegetating the existing DLD soils with a mixture of various grasses and forbs listed in Table7 or Finding 86 (Tall wheatgrass, Perennial rye, California brome, and Slender wheatgrass). The Discharger may conduct pilot tests for different mixtures of grasses and forbs. Using plant species for the evapotranspirative cover other than

those listed in Table 7 or Finding 86 shall be approved by the Executive Office in writing prior to use.

b. Continue all operations necessary to maximize degradation, transformation, or immobilization of waste constituents.

c. Continue all groundwater and unsaturated zone monitoring in compliance with the monitoring and reporting program.

d. Continue all operations to prevent runoff of waste constituents.

e. Maintain the precipitation and drainage control systems.

14. At closure, DLD slopes shall be graded to a nominal slope of one percent (1%) for drainage and shall tie into surface water collection swales nominally sloped at one-half percent (0.5%) or greater. Perimeter conveyance channels adjacent to the DLDs shall be sloped at a minimum two-tenths percent (0.2%).

15. At closure, DLDs shall receive vegetation that shall be selected to require a minimum of irrigation and maintenance, and that will maximize moisture uptake during the rainy season.

16. All vegetation shall be maintained over C-DLDs to maximize uptake of moisture in the DLD soils. The closure vegetation shall include the plant species listed in Table 7 of Finding 79 or Finding 86 (Tall wheatgrass, Perennial rye, California brome, and Slender wheatgrass).

17. Vegetation on C-DLDs shall be harvested at least **annually**. The Discharger shall conduct plant tissue analysis on the harvested biomass to determine the available disposal or beneficial reuse options. Disposal or reuse of plant biomass shall be in accordance with applicable regulatory requirements.

18. The Discharger shall maintain the final cover for C-DLDs and repair any areas of ponding.

19. Temporary construction activities associated with the EchoWater Project on C-DLD 1 include stockpiling soil and installing and maintaining a haul road for construction equipment. C-DLD 1 final cover materials may not be removed from C-DLD 1 during temporary construction operations. The Discharger shall continue to maintain C-DLD 1 during construction and repair any areas of ponding.

20. Temporary construction activities conducted on C-DLD 1 will be terminated at the completion of construction of the EchoWater Project. 90-days prior to the completion of the EchoWater Project, the Discharger shall submit a report documenting the methodologies to be implemented to restore the final cover on C-DLD 1 for approval by the Regional Board.

21. The Discharger shall perform the mitigation measures described in the *Mitigation Alternatives for Closure Design* (Mitigation Plan) in Appendix G of the December 2002 amended ROWD if any of the applicable conditions described in the Mitigation Plan are found to exist by either the Discharger or by Regional Board staff. The Discharger shall report in the adequacy of the C-DLD vegetation and if mitigation measures are required in the annual monitoring report, per MRP R5-2015-XXXX.

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

23. The Discharger shall perform all post-closure maintenance activities specified in the facility's Final Closure and Post-Closure Maintenance Plans that are not specifically referred to in this Order.

24. The Discharger shall submit to the Regional Board an annual update of the Closure and Post-Closure Maintenance Plan by **1 June** each year.

F. FINANCIAL ASSURANCE

1. By **1 June 2016**, pursuant to Title 27 Section 22207, the Discharger shall submit a report showing that it has established an irrevocable **closure, post-closure fund** with the Central Valley Water Board named as beneficiary to ensure closure and post-closure of the Class II DLDs, and Class III landfill is in accordance with the cost estimate in the 2015 Closure Plan Update. The SSBs are exempt from Title 27; however, the Discharger shall continue to provide an irrevocable **closure** with the Central Valley Water Board named as beneficiary to ensure closure of the SSBs in accordance with the cost estimate in the 2015 Closure Plan Update. The financial assurances mechanism shall be one listed in Title 27 section 22228 for which the Discharger is eligible. For financial assurance mechanisms requiring funding, the Discharger shall either fully fund the mechanism by 1 June 2016 or may propose a payment schedule. If the Discharger proposes a payment schedule to fund the mechanism, it shall submit a report by **1 June 2016** showing that the mechanism is funded. If the Discharger continues to use the existing Enterprise Fund mechanism, the minimum annual deposit into the fund shall be equal to the current closure and/or post closure cost estimate(s) divided by the active life (in years) of the active waste management units, which is 50 years for the SSBs and L-DLDs. For financial assurance mechanisms not requiring funding, such as a Guarantee, the Discharger shall submit a report showing the mechanism is in place by **1 June 2016**.

2. By **1 June 2016**, pursuant to Title 27 section 22222, the Discharger shall submit a report showing that it has established an irrevocable **corrective action fund** with the Central Valley Water Board named as beneficiary to ensure funds are available to

address a known or reasonably foreseeable release from the Class II DLDs, and Class III landfill. The SSBs are exempt from Title 27; however, the Discharger shall continue to provide an irrevocable **corrective action fund** with the Central Valley Water Board named as beneficiary to ensure to ensure funds are available to address a known or reasonably foreseeable release from the SSBs. The financial assurances mechanism shall be one listed in Title 27 section 22228 for which the Discharger is eligible. For financial assurance mechanisms requiring funding, the Discharger shall either fully fund the mechanism by 1 June 2016 or may propose a payment schedule. If the Discharger proposes a payment schedule to fund the mechanism, it shall submit a report by **1 June 2016** showing that the mechanism is funded. For financial assurance mechanisms not requiring funding, the Discharger shall submit a report showing the mechanism is in place by **1 June 2016**.

3. By **1 June** of each year, the Discharger shall submit a report to the Central Valley Water Board that reports the balance of both the closure and corrective action funds or the amounts of the Guarantees and the adjustments to account for inflation in accordance with Title 27 section 22236.

4. The Discharger shall comply with all Standard Financial Assurance Specifications listed in Section H of the SPRRs dated November 2013. Provision H.1 references the SPRRs in entirety. Violation of Section H of the SPRRs constitutes being out of compliance with Financial Assurance F.4 and not Provision H.1.

G. MONITORING SPECIFICATIONS

1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, the unsaturated zone, and waste discharge in accordance with MRP R5-2015-XXXX, and the Standard Monitoring Specifications listed in Section I of the SPRRs dated November 2013.

2. The Discharger shall, for any waste management unit in a corrective action monitoring program, comply with the corrective action monitoring program provisions of Title 27, MRP R5-2015-XXXX, and the Standard Monitoring Specifications listed in Section I of SPRRs dated November 2013.

3. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, MRP R5-2015-XXXX, and the SPRRs dated November 2013.

4. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit) shall not exceed the concentration limits established pursuant to MRP R5-201X-XXXX.

5. For each monitoring event, the Discharger shall determine whether the waste management unit is in compliance with the Water Quality Protection Standard using

procedures specified in MRP R5-201X-XXXX and the Standard Monitoring Specifications in Section I of the SPRRs dated November 2013.

6. The corrective action monitoring program consists of sampling the extraction wells semi-annually as required in MRP R5-2015-XXXX.

7. The Discharger shall comply with all Standard Monitoring Specifications and Response to a Release specifications listed in Sections I and J of the SPRRs dated November 2013. Provision H.1 references the SPRRs in entirety. Violation of Sections I and J of the SPRRs constitutes being out of compliance with Monitoring Specification G.7 and not Provision H.1.

H. PROVISIONS

1. The Discharger shall comply with the Standard Provisions and Reporting Requirements, dated November 2013. The Standard Provisions and Reporting Requirements contain important provisions and requirements with which the Discharger must comply. A violation of any of the Standard Provisions and Reporting Requirements is a violation of these waste discharge requirements.

2. Pursuant to Water Code section 13267, the Discharger shall comply with Monitoring and Reporting Program R5-2015-XXXX, which is attached to and made part of this Order. This compliance includes, but is not limited to, maintenance of waste containment facilities and precipitation and drainage controls and monitoring groundwater, the unsaturated zone, and surface waters throughout the active life of the waste management units and any applicable post-closure maintenance period. A violation of Monitoring and Reporting Program R5-2015-XXXX is a violation of these waste discharge requirements.

3. The Discharger shall not discharge waste to a new L-DLD (converted from C-DLD 1 or 5) until the following tasks are completed and approved by Central Valley Water Board staff:

    a. Install a groundwater monitoring system.

    b. Establish background groundwater quality through at least one year of monitoring (a minimum of 8 samples is required to develop statistical values for inorganic Constituents Of Concern (COCs)).

    c. Submit a report proposing a Water Quality Protection Standard including a method for calculating concentration limits.

4. Prior to discharging waste to a new L-DLD (converted from C-DLD 1 or 5), the Discharger shall establish Financial Assurance funds for closure and corrective action.

5. The Discharger shall continue the operation the corrective action groundwater extraction system until the Discharger demonstrates that the concentrations of all

COCs are reduced to levels below their respective concentration limits throughout the entire zone affected by the release, per Title 27 Section 20430, and receives written authorization from the Executive Office to terminate corrective action.

6. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

7. The Discharger shall maintain legible records of the volume and type of waste discharged to the surface impoundments and the manner and location of the discharge. Such records shall be maintained at the facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the Central Valley Water Board and of the State Water Resources Control Board, copies of these records shall be sent to the Central Valley Water Board upon request.

8. The Discharger shall comply with all applicable provisions Title 27 that are not specifically referred to in this Order.

9. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order and of the California Water Code.

10. The Discharger shall immediately notify the Central Valley Water Board of any flooding, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.

11. In the event of any change in control or ownership of the facility or disposal areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph of General Provision K.2.e in the Standard Provisions and Reporting Requirements and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive Officer.

12. The Discharger shall provide proof to the Central Valley Water Board **within sixty days after completing final closure** of the Site that the deed to the facility property,

or some other instrument that is normally examined during title search, has been modified to include, in perpetuity, a notation to any potential purchaser of the property stating that:

a. The parcel has been used for disposal of wastes.

b. Land use options for the parcel are restricted in accordance with post-closure land uses set forth in any post-closure plan (if applicable).

c. In the event that the Discharger defaults on carrying out either any corrective action needed to address a release, groundwater monitoring, or any post-closure maintenance (if applicable), then the responsibility for carrying out such work falls to the property owner.

13. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1. As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

14. The following reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared by a California-registered civil engineer or certified engineering geologist:

Task	Compliance Date
A. Construction Plans	
Submit construction and design plans for review and approval. (see all Construction Specifications in Section D, above and Section F of the SPRRs.)	**90 days prior to proposed construction**
B. Construction Report	
Submit a construction report for review and approval upon completion demonstrating construction was in accordance with approved construction plans (see Standard Construction Specifications in Section F of the SPRRs).	**60 days prior to proposed discharge**

15. All reports required by this Order shall be submitted pursuant to Water Code section 13267. The following reports shall be submitted pursuant to Section 13267 of the

California Water Code and shall be prepared by a California-registered civil engineer or certified geologist:

16. By **1 March 2016**, the Discharger shall submit a Sample Collection and Analysis Plan detailing the facility sampling and analysis procedures including quality assurance/quality control standards.

17. By **1 March 2016**, the Discharger shall submit a Water Quality Protection Standard (WQPS) Report describing the WQPS for each unit at the site for each monitored media under this Order (i.e., unsaturated zone, and groundwater). The WQPS report shall specify Constituents of Concentration, Concentration Limits, Monitoring Points, Points of Compliance, and Compliance Periods, per Title 27 §20390.

Unclassified Solids Storage Basins

18. By **1 January 2017** the Discharger shall submit an antidegradation analysis for the SSBs that includes:

    a. Whether the discharge has caused degradation of high quality groundwater. If so, for which constituents, to what degree, and whether the discharge has caused exceedance of a water quality objective.

    b. Characterization of all waste constituents to be discharged that have the potential to degrade groundwater quality.

    c. Characterization of shallow and first aquifer groundwater quality for typical waste constituents[1] upgradient and downgradient of the site and comparison to established water quality objectives [2] (include tabulated historical groundwater monitoring data and groundwater elevation contour maps for the last eight monitoring events).

    d. A description of the geology and hydrogeologic conditions of the site including groundwater elevation and gradient, transmissivity, influence of all known recharge and pumping sources, and subsurface conditions at the facility, including any proposed new disposal site or storage ponds.

    e. Groundwater degradation, if any, that has resulted from existing operations, other nearby discharges, or natural occurrences.

    f. The areal extent that the discharge has impacted or will impact the quality of the shallow groundwater, if any.

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1 Include analyses for the constituents of concern including, but not limited to: total dissolved solids, electrical conductivity, nitrate nitrogen, total nitrogen, and major anions and cations.

2 Compare to Basin Plan water quality objectives, including narrative and numeric.

g. If degradation has occurred or is expected to occur, describe the following:

   i. Any facility design features and operational practices that reduce the potential for groundwater degradation (treatment or control). Such features might include salinity source control, other pollutant source control, advanced treatment, disinfection, concrete treatment structures, and pond lining systems, etc.

   ii. Additional treatment or control measures that could be implemented and a preliminary capital and annual operations and maintenance cost estimate for each.

   iii. How current treatment or control measures are justified as Best Practicable Treatment or Controls;

   iv. How no water quality objectives will be exceeded; and

   v. Why allowing existing and/or anticipated degradation is to the maximum benefit to the people of the state.

19. If the antidegradation analysis concludes that the SSBs have degraded groundwater, the Discharger shall submit a corrective action work plan by **1 December 2017** detailing a plan and schedule to incorporate additional Best Practicable Treatment Controls to reduce degradation of groundwater.

20. By **1 September 2016**, the Discharger shall provide a report detailing how the Discharger will maintain a minimum two feet of freeboard within the SSBs, or 1.5 feet of freeboard during harvest operations, while containing flows from a 100-year wet year.

Class II Dedicated Land Disposal Units

21. The Discharger shall submit a Revised Final Action Level Work Plan for C-DLDs 1 and 5 by **1 July 2016.** The Work Plan shall describe the Discharger's proposed evaluation to determine Final Action Levels for the C-DLDs 1 and 5 cover systems that indicate when liquids may be infiltrating through the C-DLDs potentially transmitting contaminants to the groundwater.

22. The Discharger shall submit a Revised Final Action Level Report for C-DLDs 1 and 5 by **1 July 2017** that details the Discharger's evaluation, results, and final action levels for C-DLDs 1 and 5. The report shall include:

   a. A description of the C-DLDFinal Action Level evaluation.

   b. The C-DLDFinal Action Level evaluation results.

   c. Final Action Levels for C-DLDs 1 and 5.

   d. C-DLDs semi-annual sampling procedures for comparison with the C-DLD Final Action Levels.

e. Mitigation measures to be implemented if Final Action Levels are exceeded.

f. Mitigation measures to be implemented if it is determined that the C-DLD cover system is not performing.

g. Map showing sample locations, if applicable.

h. Tabulated laboratory results, if applicable.

i. Copies of laboratory reports, if applicable.

23. The Discharger shall submit a Revised Final Post-Closure Monitoring Report for C-DLDs 1 and 5 by **1 July 2017** with the updated post-closure monitoring system detailing sampling and analysis methods that are comparable to the final action levels.

24. In the event of any change in ownership of this waste management facility, the Discharger shall notify the succeeding owner or operator in writing of the existence of this Order. A copy of that notification shall be sent to the Central Valley Water Board.

25. The Central Valley Water Board will review this Order periodically and may revise requirements when necessary.

26. This Order shall take effect upon the date of adoption.

27. The Discharger shall comply with all General Provision listed in Section K of the SPRRs dated November 2013. Provision H.1 references the SPRRs in entirety. Violation of Section K of the SPRRs constitutes being out of compliance with Prohibition H.27 and not Provision H.1.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to $10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

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 of this Order, except that if the thirtieth day following the date of this Order 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.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify 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 _____.

_____
PAMELA C. CREEDON, Executive Officer

AAH/WMH