

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

CENTRAL VALLEY REGION

ORDER R5-2016-0056

WASTE DISCHARGE REQUIREMENTS
FOR
RECOLOGY HAY ROAD
RECOLOGY HAY ROAD, DBA JEPSON PRAIRIE ORGANICS
RECOLOGY HAY ROAD LANDFILL
CLASS II, III LANDFILLS, CLASS II WASTE PILE,
CLASS II LAND TREATMENT UNIT AND COMPOSTING FACILITY
CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE
MAINTENANCE, AND CORRECTIVE ACTION
SOLANO COUNTY

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

1. Recology Hay Road owns and operates the Recology Hay Road Landfill facility in Solano County. The facility is an active, municipal solid waste (MSW) landfill on Hay Road about eight miles east of Vacaville, as shown in Attachment A: Location Map. The facility is regulated under the California Water Code, section 13000 et seq.; California Code of Regulations, title 27, section 20005 et seq. (Title 27); and the Code of Federal Regulations, title 40, section 258, et seq. (40 CFR 258 or "Subtitle D"). Applicable Subtitle D regulations are implemented through State Water Resources Control Board (State Water Board) Resolution 93-62.
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 – Location Map
 - b. Attachment B – Area Map
 - c. Attachment C – Facility Map
 - d. Attachment D – Groundwater Monitoring
 - e. Attachment E – Leachate & Soil Pore Liquid Monitoring
 - f. Attachment F – Landfill Gas Controls & Monitoring'
 - g. Attachment G – Drainage Controls & Surface Water Monitoring
 - h. Attachment H – Compost Facility Map
 - i. Attachment I – Nitrate-N Plume Map
 - j. Table 1 – Maximum Allowable Groundwater Elevation
 - k. Information Sheet
 - l. December 2015 *Standard Provisions and Reporting Requirements for Nonhazardous Solid Waste Discharges Regulated by Subtitle D and/or Title 27* (Landfill SPRRs)
 - m. April 2016 *Standard Provisions and Reporting Requirements for Industrial Facilities*

Regulated by Title 27 (Industrial SPRRs)

3. The facility is on a 640-acre site in Section 2, T5N, R1E, Mount Diablo Base and Meridian, corresponding to Assessor Parcel Numbers 42-020-02, 42-020-06, and 42-020-28. The geographic coordinates of the site are Latitude 38.312° north, Longitude -121.837 ° west. The facility address is 6426 Hay Road, Vacaville, CA 95687. See Attachment B: Area Map.
4. On 29 June 2015, the Discharger submitted an amended Joint Technical Document (JTD) describing or referencing significant changes at the facility since adoption of previous WDRs Order R5-2008-0188 in December 2008, including, but not limited to, the following:
 - a. A name change to the facility operator and property owner;
 - b. Submission of various technical reports to address WDR compliance issues as required by the Board's Water Code Section 13301 Order (e.g., composting, groundwater separation, drainage controls, flood controls, and slope stability);
 - c. Implementation of in-situ groundwater remediation to address nitrate-N impacts from composting, sludge, or other discharges at the site;
 - d. Construction of additional landfill expansion modules/phases;
 - e. Installation of landfill gas controls;
 - f. Installation of additional perimeter gas monitoring wells;
 - g. Leachate recirculation;
 - h. Monitoring data indicating low-level VOC impacts to soil pore liquid and groundwater;
 - i. A revised Preliminary Closure and Postclosure Maintenance Plan; and
 - j. Updated financial assurances information.

Due to the above changes, previous WDR R5-2008-0188 no longer adequately regulates the facility and is rescinded by this Order. These revised WDRs include updated findings and requirements for the facility based on information in the amended JTD and in accordance with California Code of Regulations (CCR), title 27, division 2 (Title 27) regulations.

5. The landfill facility has been in operation since 1964, accepting household, commercial, industrial, construction and demolition, and/or special wastes from San Francisco, Vacaville, Fairfield, and other incorporated and unincorporated areas of Solano County and areas in Northern California. A portion of the facility previously operated as a burn dump from 1967 to 1972. The facility is owned and operated by Recology Hay Road.
6. The existing and future waste management units authorized by this Order are described as follows:

Unit	Class	Module	Area (acres)	Status	Liner/LCRS ¹ Components
LF-1	Class III	DM-1A	29.7	Active	Unlined
		DM-1B	14.8	Active	Approximately 8.8 acres is constructed with a gravel LCRS over compacted subgrade The remaining approximately 6 acres constructed as follows: Operations layer – one foot of soil Geotextile filter LCRS – 12 inches of gravel 60-mil HDPE liner Compacted earthfill
LF-2	Class III	DMS-2.1A & 2.1B	14.7	Active	Operations layer – one foot of soil Geotextile filter LCRS – one foot of gravel HDPE liner ² Compacted clay ³ Compacted earthfill
LF-3	Class II	DMS-2.2 & 11	26.4	Active	Operations layer – one foot of soil Geotextile LCRS – gravel ⁴
		DMS-2.3, 10 & 11.3	55.6	Future	Geotextile cushion ⁸ 60-mil HDPE liner Gundseal GCL One foot of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec) Six inch soil foundation layer Gravel ⁵ Compacted earthfill
LF-4	Class II	DMS-3, 4, 5 ⁶ , 6 & 7.1	77.9	Active	Operations layer – one foot of soil Geotextile
		DMS- 7.2 ⁷ , 8 & 9	41	Future	LCRS – six inches of gravel Geotextile cushion ⁸ 60-mil HDPE liner Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec) Six inch soil foundation layer Geocomposite 60-mil HDPE liner Compacted earthfill

Unit	Class	Module	Area (acres)	Status	Liner/LCRS ¹ Components
WP-9.1	Class II	NA	7	Active ⁹	Operations layer – one foot of soil Geotextile LCRS – six inches of gravel 60-mil HDPE liner Gundseal GCL One foot of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec) Six inch soil foundation layer Six inches of gravel Compacted earthfill
LTU	Class II	NA	3.2	No waste discharge; clean closure planned in 2016	5-feet of native soil

1. LCRS – leachate collection and recovery system.
2. DM-2.1A was constructed with an 80-mil HDPE liner in the sump and a 60-mil HDPE liner outside of the sump. DM-2.1B was constructed with a 60-mil HDPE liner.
3. DM-2.1A has one foot of CCL ($k \leq 1 \times 10^{-6}$ cm/sec) outside of the sump and three feet of CCL ($k < 1 \times 10^{-6}$ cm/sec) beneath the sump. DM-2.1B, Phase 2 has two feet of CCL ($k \leq 1 \times 10^{-7}$ cm/sec).
4. DM-2.2 contains one foot of LCRS gravel. DM-11 and future LF-3 modules contain six inches of LCRS gravel.
5. DM-2.2 contains one foot of gravel. DM-11 and future LF-3 modules contain six inches of gravel.
6. All LF-4 modules except DM-5.1 constructed with secondary geomembrane underlying primary composite liner.
7. First phase (DM 7.1) of module constructed in 2015. Second phase (DM 7.2) scheduled for completion in 2018.
8. Future disposal modules may be constructed with a geotextile cushion if rounded gravel is not used for the LCRS layer.
9. The current WP-9.1A area in service for sludge storage measures 2.7 acres. The remainder of the 4.3 acres of WP-9.1 is undergoing clean closure in 2016.

7. Onsite facilities at the Recology Hay Road Landfill include: monitoring and control systems (e.g., groundwater, landfill gas, leachate); storm water retention ponds; flood control berms; groundwater dewatering facilities; a borrow pit; materials handling and processing areas; access roads; structures; and other features. The site also includes a composting facility, acreage for future landfill expansion, and a habitat preservation (i.e., Bird Sanctuary Pond) area. See Attachment G: Drainage Controls & Surface Water Monitoring.
8. The onsite composting facility is located on the north side of the site east of LF-1. The facility includes a 22-acre, engineered composting pad; leachate collection ditches and sumps, two leachate ponds (see table below), leachate storage tanks, and storm water controls. The composting facility will ultimately be decommissioned to make room for construction of future disposal modules (i.e., LF-4, DM-9 and LF-3, DM-10) in the area. See Attachment H: Compost Facility Map.

Compost Leachate Ponds		
Pond	Unit Classification ¹	Volume (gallons) ²
A	n/a	389,000
B	n/a	15,500,000

1. Compost ponds not classified under Title 27 regulations.
2. Excludes the 1.2 feet of freeboard in Pond A and two feet of freeboard in Pond B.

9. Title 27 contains regulatory standards for discharges of solid waste promulgated by the State Water Board and the California Department of Resources Recovery and Recycling (CalRecycle). In certain instances, this Order cites CalRecycle regulatory sections. Title 27, section 20012 allows the Central Valley Water Board to cite CalRecycle regulations from Title 27 where necessary to protect water quality, provided it does not duplicate or conflict with actions taken by the Local Enforcement Agency (LEA) in charge of implementing CalRecycle regulations.
10. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated MSW landfill regulations under the Resource Conservation and Recovery Act (RCRA), Subtitle D. These regulations are under 40 Code of Federal Regulations section 258, and are hereafter referred to as either "Subtitle D" in reference to the RCRA federal law that required the regulations or "40 C.F.R. section 258.XX". These regulations apply to all California Class II and Class III landfills that accept MSW on or after the effective date of Subtitle D (9 October 1993). *State Water Resources Control Board Resolution 93-62* (Resolution 93-62) requires the Central Valley Water Board WDRs for MSW landfills to implement the applicable provisions of the federal MSW regulations that are necessary to protect water quality, and in particular the containment provisions and the provisions that are either more stringent or that do not exist in Title 27.
11. 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 I of these WDRs below, and in the Landfill SPRRs and Industrial SPRRs dated December 2015 and April 2016 which are part of this Order. Monitoring and reporting requirements are included in the Monitoring and Reporting Program (MRP) R5-2016-0056 and in the Landfill and Industrial SPRRs. In general, requirements that are either in regulation or otherwise apply to a classified unit 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 (Sections A through I) of these WDRs, and such requirement in the WDRs supersedes the requirement in the SPRRs.
12. On 4 August 2015, the State Water Resources Control Board adopted *General Waste Discharge Requirements for Composting Operations Order No. WQ 2015-0121-DWQ* (Composting General Order or CGO) applicable to various types of composting operations, including, but not limited to, facilities that compost green waste and food waste. One of the purposes of the CGO was to prescribe uniform and consistent waste

discharge requirements for similar types of composting operations consistent with the Water Code, Title 27, and applicable regulations in order to protect water quality. The CGO required that new and existing composting operations submit a technical report describing their composting operations along with a Notice of Intent to comply with the CGO.

13. Listed exceptions to the CGO include composting operations located at a landfill regulated under WDRs. Such composting operations do not need to be covered under CGO if the landfill facility's WDRs include requirements for the composting operation, as determined by the Regional Water Board. These WDRs prescribe waste discharge requirements for both the landfill and composting facility at the Recology Hay Road Landfill. The Discharger is therefore not required to obtain coverage under the CGO.

WASTE CLASSIFICATION AND UNIT CLASSIFICATION

14. The Discharger proposes to discharge nonhazardous wastes including MSW in Class III LF-2 and inert and nonhazardous construction and demolition debris (C&D) in the Class III landfills (i.e., LF-1 and LF-2). Since September 1992, waste discharges to LF-1 have been limited to inert wastes (e.g., concrete, asphalt, and tires). LF-1 also accepts friable and non-friable asbestos. Up to 11,000 tons (3,667 tons/year) of asbestos containing waste (ACW) are estimated to have been discharged to LF-1 since January 2013. These classified wastes may be discharged only in accordance with Title 27, Resolution No. 93-62, and the Code of Federal Regulations, Title 40, Part 258 as required by this Order.
15. The Discharger proposes to continue to discharge inert wastes, nonhazardous wastes including MSW, and asbestos-containing wastes to Class II waste management units at the facility. The Discharger also proposes to continue to discharge designated waste to Class II landfill units (i.e., LF-3 and LF-4) including household, commercial, and industrial (H/C/I) wastes; de-watered sewage sludge; industrial sludges; treated wood waste; dredge debris; slab/construction/demolition debris; commercial/industrial waste; glass cullet; asbestos containing waste and other non-hazardous or designated wastes. Wastes requiring special handling ("special wastes", as defined in Title 27) (e.g., triple-rinse pesticide containers; tires; large dead animals; medical wastes; incinerator ash; and agricultural wastes) are also discharged to the Class II landfill units. These classified wastes may be discharged only in accordance with Title 27, Resolution 93-62, and Subtitle D as required by this Order.
16. Contaminated soil (C-Soil) discharged to the landfill are typically classified as designated waste and generally include petroleum-impacted soil; metals-impacted soil; pesticide or PCB-impacted soil; and/or soil mixed with incinerator ash. Class II landfill modules may accept C-Soil for disposal, as alternative daily cover (ADC), and as foundation layer for final cover. These WDRs authorize the discharge of special wastes such as C-Soil to Class II units LF-3 and LF-4, but no new C-Soils may be discharged to units LF-1 or LF-2.

17. Lead-contaminated soil (LC-soil) previously accepted from the City of San Francisco Metro Muni project, and re-classified as “nonhazardous” by the Department of Toxic Substances Control (pursuant to Section 66260.200(f), Title 22), and approved by the Central Valley Water Board on 28 September 1993 is stockpiled on Unit LF-2, module DM-2.1 beneath the DM-2.2 eastern side slope liner. Although DM-2.1 is a Class III unit and the LC-soil is a designated waste, the Discharger received approval from the Central Valley Water Board to stockpile LC-Soils on DM-2.1 from the Islais Creek Contract B Project and the Embarcadero Roadway project on 16 November 1994 and 25 February 1994, respectively. The LC-Soil stockpiles include long term stockpiles for future beneficial reuse as foundation soil for final cover and operational stockpiles for beneficial reuse such as ADC.
18. Approximately 593,000 cubic yards of C-Soil and sludge are estimated to have been discharged to/stockpiled at LF-2 and LF-3 since January 1993. These WDRs authorize the existing C-Soil stockpiles to remain on the disposal modules where they exist today, and authorize LC-soil to be used as a foundation cover for LF-2. These WDRs also authorize the discharge of special wastes such as C-Soil to Class II units LF-3 and LF-4, but no new C-Soils may be discharged to units LF-1 or LF-2. See Prohibition A.1.b.
19. The Discharger also proposes to continue to discharge de-watered (i.e., all free liquids removed) wastewater treatment plant (WWTP) sludge for discharge to the landfill and for beneficial reuse in landfill operations (e.g., alternative daily cover, soil admix). Sludge accepted at the landfill during the wet season is either discharged directly to the landfill with solid waste (i.e., co-disposal) or stored in an onsite waste pile (WP-9.1A). At the end of the wet season, the sludge is moved to, and temporarily stockpiled on, active module(s) where it will be beneficially reused as alternative daily cover (ADC) and/or admixed with clean soil for use as operations layer. Any sludge not dried and/or used during a dry season is winterized with intermediate cover for future beneficial use.

These WDRs allow the stockpiling of dewatered sludge on landfill modules that are Class II units. See Prohibition A.4.d. These WDRs allow the Discharger to continue discharging these semi-solid wastes to WP-9.1A and LFs-3 and 4 provided that the discharge complies with the applicable co-disposal provisions of this Order and Title 27 and Subtitle D regulations.
20. Under previous WDRs, sludge drying operations were also historically conducted at an onsite landfill treatment unit (LTU) immediately east and south of WP-9.1. The LTU is no longer accepting sludge and is in the process of clean closure. Additionally, the eastern portion of WP-9.1 is also in the process of clean closure.
21. 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.

22. The Discharger proposes to continue to discharge wastes containing greater than one percent (>1%) friable asbestos to LF-1 (DM-1A and DM-1B). The Discharger also proposes to discharge wastes containing greater than one percent (>1%) friable asbestos to LF-3 and LF-4. These wastes are classified as 'hazardous' under California Code of Regulations, title 22 (Title 22). However, these wastes do not pose a threat to groundwater quality and California Health and Safety Code, section 25143.7 permits their disposal in any landfill that has WDRs that specifically permit the discharge, provided that the wastes are handled and disposed of in accordance with applicable statutes and regulations.
23. The Discharger proposes to continue to discharge treated wood waste in the composite-lined modules DM-2.2 and DM-3 through DM-11. Treated wood waste is not allowed in modules DM-1 or DM-2.1 (i.e., in Units LF-1 or LF-2). Title 22 defines "treated wood" to mean wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. Sec. 136 and following). This may include but is not limited to waste wood that has been treated with chromated copper arsenate (CCA), pentachlorophenol, creosote, acid copper chromate (ACC), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), or chromated zinc chloride (CZC).
24. Title 22, section 67386.11 allows treated wood waste to be discharged to a composite-lined portion of a MSW landfill that is regulated by WDRs issued pursuant to the Water Code provided that the landfill owner/operator:
 - a. Comply with the prohibitions in Title 22, section 67386.3, which are:
 - i. Treated wood waste shall not be burned, scavenged, commingled with other waste prior to disposal, stored in contact with the ground, recycled without treatment (except as in iii, below), treated except in compliance with Title 22, section 67386.10, or disposed to land except in compliance with Title 22, section 67386.11.

- ii. Any label or mark that identifies the wood and treated wood waste shall not be removed, defaced, or destroyed.
 - iii. Treated wood waste may be recycled only by reuse when all of the following apply:
 - 1) Reuse is on-site.
 - 2) Reuse is consistent with FIFRA approved use of the preservative.
 - 3) Prior to reuse, treated wood waste is handled in compliance with Title 22, division 4.5, chapter 34.
 - b. Ensure treated wood waste is managed at the landfill according to Title 22, division 4.5, chapter 34 prior to disposal.
 - c. Monitor the landfill for a release and if a verified release containing one or more TWW constituents is detected from module where treated wood is discharged, the disposal of treated wood will be terminated at the module with the verified release until corrective action ceases the release.
 - d. Handle treated wood waste in a manner consistent with the applicable sections of the California Occupational Safety and Health Act of 1973.
25. Title 27, section 20690 allows the use of alternative daily cover (ADC) at MSW landfills upon approval by the Local Enforcement Agency (LEA) and concurrence from CalRecycle. Title 27, section 20705 provides the Water Board's regulations for all daily and intermediate cover including that it shall minimize the percolation of liquids through waste and that the cover shall consist of materials that meet the landfill unit classification (Class II or Class III). The regulations also require that for non-composite lined portions of the landfill, that any contaminants in the daily or intermediate cover are mobilized only at concentrations that would not adversely affect beneficial uses of waters of the state in the event of a release. For composite-lined portions of the landfill, the regulations require that constituents and breakdown products in the cover material are listed in the water quality protection standard.
26. The Discharger proposes to use the following materials for ADC: dried sewage sludge/biosolids; C-Soil; dredge spoils, foundry sands, & contaminated sediment; green waste materials/compost; ground wood, C&D fines, shredded tires, moisture-conditioned ash and/or cement kiln dust, and mixtures of these wastes. Geosynthetic fabric, blankets, and foam products are also used as ADC. All ADC materials are stockpiled at or near the working face prior to use. The Discharger does not use any ADC materials for intermediate cover, except for biosolids as a soil amendment. The Discharger has demonstrated that these materials will minimize percolation of liquids through waste, that they meet the unit classification where they will be discharged, and that the

constituents and breakdown products are included in the water quality protection standard. These WDRs allow the Discharger to use these materials as ADC.

27. The Discharger also proposed to continue to use soil admix for ADC and construction operations and as foundation soil for closure. The soil admix operations are conducted during the dry season on covered portions of LF-3 and/or LF-4 proximate to active landfill modules. The admix soil typically consists of a mixture of dried sludge (60%), compost overs (20%) and onsite soil (20%), or only dried sludge (70%) and soil (30%). Once mixed, the soil is stockpiled next to the module where it is needed for construction operations. For modules not scheduled for construction that year, the stockpiles are winterized prior to the wet season by grading and capping them (with a one-foot thick layer of interim cover) for drainage and erosion control. These WDRs prohibit the stockpiling of wastes on landfill modules, with certain exceptions, including, but not limited to, C-Soil and soil admix operations for closure and construction purposes.
28. Landfills propose new ADC materials regularly in order to preserve landfill air space and to beneficially reuse waste materials. Title 27, section 20686 includes regulations for beneficial reuse, including use of ADC. Approval of ADC is primarily handled by the LEA and CalRecycle under Title 27, section 20690. This Order allows any ADC proposed for use at the facility after the adoption of this Order to be approved by Central Valley Water Board staff provided the Discharger has demonstrated it meets the requirements in Title 27, section 20705. The approved ADC materials should then be listed in the facility's WDRs during the next regular update or revision with information about the Discharger's demonstration. This Order also includes a requirement that ADC only be used in internal areas of the landfill unless the Discharger demonstrates that runoff from the particular ADC is not a threat to surface water quality. The demonstration can take sedimentation basins into account.
29. About 2.4 million gallons of leachate are pumped from the landfill units and waste pile each year. The average daily pumping rate for leachate over the Second Half 2014 and First Half 2015 was 337 gpd at DM-1B, 283 gpd at LF-2, 1,040 gpd at LF-3, 1,510 gpd at LF-4, and 669 gpd at WP-9.1. The highest average daily pumping rates occurred at LF-3, DM-11 in December 2014 (3,981 gpd).
30. Based on the historical leachate monitoring data, shown in the tables below, leachate is considered a designated waste.

Min-Max Historical Leachate Concentration (ug/L, except where noted)									
Unit:	LF-1						LF-2 ²		
	DM-1A ¹			DM-1B ²					
	Min	Max	Median	Min	Max	Median	Min	Max	Median
Constituent:	Min	Max	Median	Min	Max	Median	Min	Max	Median
Ammonia (mg/L):	50	920	540	6.4	70	13	15	36	20
General Minerals (mg/L):									
Bicarbonate	710	5,500	3,300	595	2,100	1,000	1,030	2,100	1,700
Chloride	61	6,900	3,300	380	2800	634	490	6,300	3,100
Nitrate	ND	2	0.22	ND	7.79	0.1	ND	11	0.19
Sulfate	ND	130*	6	0.48	220	6.35	ND	2,300	76
Total Dissolved Solids	500	15,000	7,500	810	8,610	1,960	2,900	13,400	7,000
VOCs (ug/L):									
Alcohols and ethers	ND	760	0.61	ND	320	0.6	ND	840	1.8
BTEX Compounds	ND	35	3.05	ND	3.7	0.24	ND	16	0.70
Freon Compounds	ND	5.1	0.16	ND	2	0.16	ND	2	0.16
Halogenated VOCs									
1,1-Dichloroethane	ND	1	0.12	ND	2.2	0.5	ND	2.3	0.93
1,2-Dichloroethane	ND	0.88	0.17	ND	1	0.16	ND	1.4	0.355
Methylene Chloride	ND	1.7	0.28	ND	5	0.27	ND	6.5	0.3
Vinyl Chloride	ND	10	1	ND	1	0.16	ND	2.5	0.91
Other	ND	49	0.18	ND	25	0.17	ND	50	0.24
Ketones	ND	91*	7.10	ND	280	2.50	ND	31	4.10
Other VOCs	ND	500	1.15	ND	500	0.57	ND	500	0.8
Dissolved Metals (mg/L):									
Arsenic	ND*	0.2	0.028	0.00563	0.1	0.012	ND	0.1	0.015
Chromium (total)	0.00092	0.038	0.01	ND	0.01	0.01	ND	0.49	0.01
Chromium (Hex)	NA	NA	NA	ND	ND	ND	ND	0.0069	NA
Iron	1.3	11*	7	ND	17	6.2	0.29	4.90	1.40
Lead	ND	0.2*	0.012	ND	0.1	0.005	ND	0.1	0.005
Manganese	0.11	2.30	0.21	0.14	6.58	2.50	0.71	27.00	2.66
Mercury	ND	0.0002	0.000017	ND	0.00015	0.0002	ND	0.001	0.0002
Semi-VOCs (ug/L):	ND	83	0.34	ND	810	3	ND	800	4.8
Organo-Pesticides (ug/L):	ND	0.075	0.012	ND	40	0.48	ND	40	0.48

1. Based on leachate monitoring well data, 1996-2015 (unit has no LCRS).

2. Based on LCRS sump monitoring data, 1996-2015.

*. Outlier removed.

Min = minimum, Max = maximum

ND – (Non-detect) – detection limits are variable

NA – not applicable, too few detections

Min-Max Historical Leachate Concentration (ug/L, except where noted)									
Unit:	LF-3 ¹			LF-4 ¹			WP-9 ¹		
Constituent:	Min	Max	Median	Min	Max	Median	Min	Max	Median
Ammonia (mg/L):	0.05	160	22	0.91	6,600	1,300	3.1	830	335
General Minerals (mg/L):									
Bicarbonate	430	2,400	1,200	360	19,000	4,200	440	4,300	1,500
Chloride	70	3,000	1,200	15	6,700	1,600	440	2,180	940
Nitrate	ND	170	0.096	ND	260	.22	ND	950	17.5
Sulfate	ND	2,600	41	ND	1,800	20	180	4,280	868
Total Dissolved Solids	630	7,200	3,540	44	22,000	4,800	1,900	16,300	5,200
VOCs (ug/L):									
Alcohols and ethers	ND	890	3.2	ND	8,600	3	ND	180*	1.2
BTEX Compounds	ND	350	0.61	ND	170*	9.10	ND	30*	0.50
Freon Compounds	ND	250	0	ND	90	0.22	ND	9	0.45
Halogenated VOCs									
1,1-Dichloroethane	ND	10.9	0.76	ND	18	0.75	ND	5.0	0.2
1,2-Dichloroethane	ND	5.0*	0.32	ND	29	2	ND	8	0.4
Methylene Chloride	ND	5.0*	0.31	ND	8.5*	0.48	ND	9.1	0.6
Vinyl Chloride	ND	7.3*	0.87	ND	17*	1.2	ND	6.8	0.31
Other	ND	550*	0.24	ND	300	0.24	ND	200	0.5
Ketones	ND	16,600*	6.50	ND	3,700	17.50	ND	180	13.00
Other VOCs	ND	2500	0.8	ND	5800	1.1	ND	5000	2
Dissolved Metals (mg/L):									
Arsenic	ND	0.235	0.012	ND	0.82	0.046	ND	46	0.033
Chromium (total)	ND	0.49	0.01	ND	1.7	0.03	ND	11	0.01
Chromium (Hex)	ND	0.0069	NA	ND	0.016	NA	ND	0.0068	NA
Iron	0.06	261.00	4.90	0.23	23.00	4.50	0.30	12.00	3.00
Lead	ND	0.662	0.005	ND	0.2	0.005	ND	12	0.005
Manganese	2.60	40.00	6.50	0.035	26.00	1.60	4.50	27.00	11.50
Mercury	ND	0.0018	0.0002	ND	0.0055	0.0001	ND	0.00028	0.002
Semi-VOCs (ug/L):	ND	1,000	4.9	ND	1700	3.8	ND	800	10
Organo-Pesticides (ug/L):	ND	100	0.48	ND	50	0.074	ND	50	0.48

1. Based on LCRS sump monitoring data, 1996-2015.

*. Outlier removed.

Min = minimum, Max = maximum

ND – (Non-detect) – detection limits are variable

NA – not applicable, too few detections

The MRP under these WDRs requires that the Discharger monitor leachate monthly for flow, semi-annually for monitoring parameters, and every 5 years for all constituents of concern.

31. The Discharger proposes to return leachate and landfill gas condensate to the composite-lined landfill units from which they came. Title 27, section 20340(g) requires that leachate be returned to the unit from which it came or be discharged in a manner approved by the regional board. This section of Title 27 also references State Water Board Resolution 93-62 regarding liquids restrictions in 40 C.F.R. section 258.28 for MSW landfills. 40 C.F.R. section 258.28 states that liquid waste may not be placed in MSW landfill units unless the waste is leachate or gas condensate derived from the landfill unit and the unit is designed with a composite liner and an LCRS. Therefore, leachate and landfill gas condensate from composite lined units with an LCRS may be returned to the unit from which they came. This Order includes requirements for

returning leachate and landfill gas condensate back to composite-lined units such that the liquid waste is not exposed to surface water runoff, will not cause instability of the landfill, and will not seep from the edges of the units.

32. Currently leachate pumped from the LCRS sumps of the landfill units is either disposed of offsite or returned to the unit from which it came using a recirculation system. LFG condensate recovered from the LFG extraction system of a unit is either pumped into the landfill LCRS sump(s) of that unit for recirculation with leachate or stored in tanks with leachate for offsite disposal. Currently, LF-3, DM-11 is the only unit/module undergoing leachate/condensate recirculation.
33. Leachate from the LCRS sumps on the west half of the site destined for offsite disposal is piped to a tank farm located on the northwest side of LF-3, DM-2.2, while leachate collected from LCRS sumps on the east half of the site is piped to a tank farm west of WP-9.1. See Attachment E: Leachate & Soil Pore Liquid Monitoring. The tanks are periodically pumped and the leachate hauled by tanker truck to the Easterly Wastewater Treatment Plant in Elmira. The MRP under these WDRs requires that the Discharger monitor and report the volume of leachate (including any commingled LFG condensate) pumped from storage and hauled offsite each month.
34. In January 2009, the Discharger completed installation of a leachate recirculation system at LF-3, DM-11 in accordance with a design report approved by Central Valley Water Board staff.¹ The system included construction of a 300-foot long, 13-foot deep infiltration trench on top of the module and associated valves and piping. One foot of tire chips were placed on the bottom of the trench overlain by the leachate injection pipe and another 3 feet of tire chips. The trench was then backfilled with waste and capped with intermediate cover. PVC piping was also installed to convey leachate from the module's LCRS sumps to the infiltration trench. Each sump was equipped with a flow meter and shut-off valve to track the quantity of liquid re-circulated back into the unit and switch flows back to the leachate storage tanks when desired. No re-circulation system has been installed or is currently proposed for installation at LF-4.
35. The Discharger proposes to continue discharging leachate and LFG condensate to the existing recirculation operations at LF-3. These WDRs allow the Discharger to return landfill leachate and/or LFG condensate to the active MSW landfill unit from where it was generated, provided such MSW landfill unit was constructed with a composite liner system and LCRS.

These WDRs also require that the Discharger submit a LFG Controls O&M Plan for the LFG extraction system, including a plan for the separate handling of LFG from any unit to which condensate is being returned, so that condensate removed from other units

1. See August 2008 report *Leachate Recirculation, Norcal Waste Systems Hay Road Landfill*, prepared by Golder Associates, Inc..

can be appropriately disposed of at an authorized facility. See Provision I.11.c.

36. Liquid wastes consisting of leachate and LFG condensate derived from LF-3, Module DM-11 are returned to the unit via a recirculation trench constructed on top of DM-11 in accordance with Title 27 and Subtitle D liquids handling regulations. Historically, up to 600,000 gallons of liquids was recovered and returned to DM-11 per year. Leachate from LF-4 is currently piped to storage tanks for offsite disposal at a wastewater treatment plant.

These WDRs prohibit the discharge of leachate and/or LFG condensate from one unit to another and require that the Discharger submit a Landfill Liquids Management Plan to ensure that landfill liquids returned to a unit are properly handled. See Facility Specification C.2.c.

Composting Facility

37. Feedstock accepted at the onsite composting facility consists of green waste, manure, and food wastes, as defined in Title 14 CCR. The composting facility may also accept feedstocks defined in the CGO, which include agricultural material, paper material, and vegetative and non-vegetative material. Green waste is used as feedstock in both turned windrow and aerated static pile composting operations conducted at the site, while food waste is used as feedstock only in aerated static pile composting. Additives used in composting include, but are not limited to, crab shells (for pH control) and lime (for odor control). No agricultural wastes are accepted at the facility. Finished compost is temporarily stockpiled on the compost pad in a separate area from the active composting, pending sale as a commercial product. Some of the finished compost is also used onsite as a soil amendment for landfill cover.
38. The composting facility is also regulated under a composting permit issued by the LEA (Compostable Materials Handling Facility Permit), which currently authorizes the facility to accept an average of 600 tons per day within a 7-day period but no more than 750 tons per day on any given day of composting materials; and to store up to 225,000 cubic yards of feedstock, active compost, and/or finished compost at any one time. Recyclable materials used for beneficial re-use are not counted towards the permitted tonnage limit.
39. Feedstock materials may be processed with a grinder for size reduction and mixing. The grinding process, when used, results in a blending of the incoming feedstock materials. In addition to grinding, material passes over a series of screens to separate oversized material and contaminants. Blending is also accomplished using a front-end loader or windrow turner. After blending, the compost material is moisture conditioned on an on-going basis, as necessary. Water for moisture conditioning may come from the compost ponds, borrow pit, or on-site water wells.
40. The onsite Composting Facility employs two different composting methods, as follows:
- a. Turned Windrow Composting -- utilizes primarily green material (e.g., tree trimmings,

plant wastes, untreated wood wastes, paper products, and natural fiber products) as feedstock. Wood chips or similar materials also used as an additive to adjust carbon/nitrogen ratio or as an amendment to the final product. After processing, the feedstock blend is arranged in windrows approximately 8 feet apart. The windrows are periodically turned using a windrow turner or front-end loader to aerate the active compost material.

- b. Aerated Static Pile Composting -- used to help minimize the release of organic vapors, nuisance odors, and other gases to the atmosphere. The method utilizes blended green material and food waste as feedstock. After blending, the material is placed in windrows overlying an engineered aeration system consisting of perforated pipes. Air is then drawn through the windrows using a blower motor plumbed to the underlying perforated pipes and exhausted into an engineered bio-filter comprised of wood chips, ovals, and/or other processed organic material.
41. Both turned windrows and aerated static piles can utilize various covers, such as bio-covers or tarps. During active composting, the turned windrows and aerated static piles are monitored for moisture and temperature. Additional moisture is added, if required, to maintain the moisture content within an acceptable range. Temperature is also monitored to document that pathogen reduction has occurred. After completion of the composting process, the composted material is allowed to cure for approximately 30 days to allow the material to stabilize. After curing, the composted material is screened to size the material prior to marketing.

SITE DESCRIPTION

42. The site slopes gently from west to east consistent with the regional topography. Topographic relief is generally limited to small swales, depressions, and mounds or ridges formed from drainage; wind erosion; and creek overflows. Surface elevations in the area range from about 20 to 30 feet above mean seal level (MSL) and with maximum drainage grades of about 2 percent to the southeast. Vegetation in the area consists primarily of farmed livestock feed crops (i.e., grains) and native grasses, forbs, and oak trees. Land uses within one mile of the site include irrigated and non-irrigated agriculture, livestock grazing, open space, and transportation (roads).
43. A 2015 Department of Water Resources (DWR) well survey identified at least 5 supply wells within a one-mile radius of the site, including one domestic well, one agricultural well, and three industrial wells. The wells ranged in depth from about 50 to 180 feet below ground surface (bgs). Three of the wells were within 1,000 feet of the landfill facility boundary, including the domestic well and two onsite industrial wells. Several additional supply wells were identified immediately west of the survey area. Estimated yields for these wells ranged from 30 to 100 gallons per minute (gpm).
44. The site receives an average of about 20.5 inches per year of precipitation based on DWR's Rainfall Depth Duration Frequency data for the Dixon Station about 6 miles north of the site. The 25-year, 24-hour precipitation event for this station is 3.3 inches, the 100-year, 24-hour precipitation event for this station is 4.0 inches, and the 1,000-year,

24-hour precipitation event for this station is 5.1 inches. The mean annual evaporation at the site is about 55.1 inches per year based on monthly average historical data from DWR's CIMIS Weather Station Dixon 121, also in Dixon about six miles north of the site. Mean monthly evaporation typically exceeds mean monthly precipitation in all months of the year, except January, February, November, and December. Net average annual evaporation at the site is estimated to be about 34.6 inches.

GEOLOGY

45. The Sacramento Valley is part of the Great Valley sedimentary basin, a 22,500 square mile area comprising California's Central Valley. The Great Valley area is bounded by the Coast Range to the west, the Sierra Nevada to the east, the Tehachapi Mountains to the south, and the Klamath Mountains to the north. Continental deposits in the Sacramento Valley consist of alluvial, fluvial, delta, and flood plain sediments generated by glaciation processes in the Sierra Nevada, and by weathering and erosion in the surrounding mountain ranges. Deposited over geologic time by the Sacramento and San Joaquin Rivers and their tributaries, such sediments are estimated to be thousands of feet thick in some areas. Underlying the continental deposits are ancient marine deposits.
46. The site is in the Putah Plain in the southwestern part of the Sacramento Valley. The Putah Plain is a late Pliocene to Recent age alluvial plain formed by Putah Creek and various meandering streams. Soils underlying the Putah Plain are classified as Stream Channel Deposits (Recent); Younger Alluvium (Holocene); Older Alluvium (late Pleistocene); and the Tehama formation (Pliocene-Pleistocene). Younger Alluvium is found primarily in the northeast part of the site and generally consists of fine-grained sandy silts up to 20 feet thick. Older Alluvium is found at the ground surface over most of the remainder of the site. The Older Alluvium consists of silts and clays interspersed with sand and gravel lenses ranging from 60 to 130 feet thick and are characterized by a dense, clay-rich B-Horizon. The Tehama formation underlies the Older Alluvium and consists primarily of silts and clays with a moderate degree of calcium carbonate cementation and fine sand in the matrix. Tehama deposits vary in thickness from about 100 feet thick west of the site to 2,500 feet thick east of the site.²
47. Quaternary fault zones within 62 miles (100 km) of the site include, but are not limited to, the following:
 - a. Midland Fault Zone (4.3 miles to the east);
 - b. Vaca Fault Zone (4.5 miles to the SW);
 - c. Green Valley/Cordelia Fault Zone (14 miles to the west);
 - d. Concord Fault Zone (22 miles to the SW);

2. A 2014 soil survey conducted by the Natural Resources Conservation Service (NRCS) describes onsite soils as moderately-to-poorly drained sandy clay and clay loam soils (e.g., Pescadero, San Ysidro, and Solano series). See *September 2014 Soil Survey data for Solano County*, U.S. Department of Agriculture, NRCS website at <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>.

- e. Greenville Fault Zone (24 miles to the south);
- f. West Napa Fault Zone (25 miles to the west);
- g. Dunnigan Hills Fault Zone (26 miles to the north);
- h. Rodgers Creek Fault Zone (29 miles to the SW);
- i. Calaveras Fault Zone (34 miles to the SW);
- j. Hayward Fault (35 miles to the west-SW);
- k. San Andreas Fault Zone (50 miles to the southwest); and
- l. Foothills Fault Zone (55 miles to the northwest).

All of the above fault zones have Holocene components (faults or fault segments) and at least five (Midland and/or Vaca, West Napa, Hayward, San Andreas, and Foothill) are known to have been historically active during the past 150 years. An additional potentially significant fault zone proximate to the site is the Great Valley Thrust Zone (Segment 4), a submerged, NW-SE trending fault system along the eastern foothills of the Coast Range. Little is currently known about this fault system and it is possible that it may include the Vaca and/or Midland Fault zones. There are no known Holocene faults within 1,000 feet of the facility.

48. The maximum credible earthquake (MCE) for the site was estimated to be 6.9 on the Richter scale based on a seismic event occurring along the Midland Fault about 4.3 miles west of the site.³ Peak ground acceleration (PGA) of 0.58g was calculated for this event.⁴

SURFACE WATER CONDITIONS

49. The site is drained by the A-1 Channel, an unlined agricultural canal fed by New Alamo Creek and a small network of canals north of the site. The A-1 Channel was created from an older portion of Alamo Creek that once flowed diagonally across the eastern part of the site, but was re-routed north of the site in the early 1960s.⁵ In 1994, the A-1 Channel was re-routed along the north and east sides of the site and deepened. At the southeast corner of the landfill site, the A-1 Channel resumes the southeasterly course of the former Alamo Creek section, ultimately emptying into Ulatis Creek about 3 miles southeast the site. Ulatis Creek then empties into the Cache Slough, which is tributary to the Sacramento-San Joaquin Delta. See Attachment A: Location Map.

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3. MCE values for above faults calculated using applicable empirical magnitude scaling regressions recommended by Stirling et al. (2013). MCE for fault with highest median PGA (i.e., Midland Fault) selected as MCE for site.
4. Median PGA values for above faults calculated using a weighted average of four Next Generation Attenuation functions (Abraham and Silva 2008; Boore and Atkinson 2008; Campbell and Borzognia 2008; and Chiou and Youngs 2008) that predict ground accelerations as a function of earthquake magnitude, fault type, source-to-site distance, and site soil conditions ($V_{s30} = 380$ meters/sec).
5. In the early 1960's, Alamo Creek was re-directed to flow directly east into Ulatis Creek about 1.8 miles north of the site. The bypassed portion of Alamo Creek became the "A-1 Channel".

50. The site is in the Elmira Hydrologic Area of the Valley Putah-Cache Hydrologic Unit in the Sacramento Hydrologic Basin Planning Area (as depicted on the interagency hydrologic maps prepared by the Department of Water Resources in August 1986).
51. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* (hereafter Basin Plan) designates beneficial uses; establishes water quality objectives; contains implementation plans and policies for protecting waters of the basin; and incorporates by reference, plans and policies adopted by the State Water Resources Control Board.
52. The beneficial uses of the A-1 Channel, by application of the tributary rule, are the same as those of the Sacramento San Joaquin Delta specified in the Basin Plan.⁶ These existing and potential designated uses include municipal and domestic supply, agricultural supply (stock watering and irrigation), industrial service supply, industrial process supply, water contact recreation, non-contact water recreation, warm freshwater habitat; cold fresh water habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; wildlife habitat; and navigation.
53. About 80% of the landfill facility area (i.e., all but the southwest portion) is within a 100-year flood plain of Ulatis Creek based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Map No. 06095C0325E (Community - Panel Number 060631-0325E), effective date May 4, 2009. This area corresponds to about two-thirds of LF-1, one-half of LF-2 and LF-3, all of LF-4, and most of the area planned for future landfill development (e.g., composting area).
54. Title 27 requires that Class II and Class III landfills be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100 year return period. See Sections 20250(c) and 20260(c). Subtitle D regulations (40 CFR 258.11) further require that the Discharger demonstrate that any new, existing, or lateral expansion MSW landfill units located in 100-year floodplain will not restrict the flow of a 100-year flood; reduce the temporary water storage capacity of the floodplain; or result in washout of solid waste so as to pose a hazard to human health and the environment. The owner or operator is required to place the above demonstration in the operating record. The following such demonstration was included in the JTD.
 - a. Flow Restriction - The FEMA map indicates that maximum 100-year flood depths adjacent to the site would be about 5 feet. The landfill facility would therefore be unlikely to significantly impede flood waters.

⁶. In 2010, the Central Valley Water Board adopted a basin plan amendment (Order R5-2010-0047) that re-designated certain beneficial uses of a section of Alamo Creek (renamed "Old Alamo Creek") downstream of the Easterly WWTP between Vacaville and its closest point north of the site. The order did not affect the beneficial uses of downstream surface waters such as Sweany Creek. Also, the basin plan amendment did not affect a new section of Alamo Creek (referred to as "New Alamo Creek") created to the south to bypass discharges from the Easterly WWTP.

- b. Temporary Floodplain Storage Capacity – Realignment and deepening of the A-1 Channel along the northern and eastern sides of the site in 1994 more than offset the 1,350 acre-feet estimated volume of the 100-year floodplain displaced by the landfill. The onsite borrow pit is also plumbed to the 100-year flood plain via surface drains, providing additional buffering capacity in the event of a 100-year flood. It is therefore unlikely that the landfill will reduce the temporary water storage capacity of the 100-year floodplain.
- c. Washout - All landfill units that would be exposed to a 100-year flood have exterior perimeter berms exceeding 28 feet MSL, the maximum estimated 100-year flood elevation at the site, including waves. Specifically, LF-1 and LF-2 have a 30-foot high perimeter berm and LF-3 and LF-4 each have 40-foot high perimeter berms. Future LF-3 and LF-4 expansion modules located within the 100-year floodplain will be constructed with exterior perimeter berms of at least 28 feet NGVD 29 as necessary for 100-year flood protection.

These WDRs require that all classified units at the site be constructed and maintained with at least 28 feet NGVD 29 exterior perimeter berms to prevent inundation from a 100-year flood. See Construction Specification E.13.

- 55. Storm water runoff from the landfill units drains by sheet flow, or is directed to, an unlined ditch along the facility perimeter that discharges via two outfalls to the onsite Bird Sanctuary Pond immediately southeast of the landfill. Runoff from LFs-2 and 3 generally flows counterclockwise to this pond via an unlined ditch along the southern perimeter of the facility, while runoff from LFs-1 and 4 generally flows clockwise to this pond via an unlined ditch along the northern and eastern perimeter of the facility. Runoff from the composting facility is captured and contained in separate facilities within the composting area, as described in Finding 141. A small amount of storm water from LF-2 is also captured in an onsite sedimentation basin immediately south of the onsite composting facility. Storm water discharges from the Bird Sanctuary Pond to the A-1 Channel are sampled under Water Quality Order 2014-0057-DWQ, the Statewide Industrial Storm Water General Permit. See Attachment G: Drainage Controls & Surface Water Monitoring.
- 56. LF-1 was designed to handle a 100 year, 24-hour storm event. LFs-2 through 4 were designed to handle a 1,000 year, 24-hour storm event. At final closure of LFs-1 through 4, all landfill units and drainage facilities, including overside drains, perimeter ditch, culverts, and sedimentation basin will be designed to handle a 1,000-year, 24-hour storm event consistent with the Class II designation of LFs-3 and 4. All compost drainage facilities, including the ponds, were designed to handle a 25-year, 24-hour peak storm event.
- 57. In addition to storm water, groundwater pumped from the onsite borrow pit is discharged to the Bird Sanctuary Pond via the southern perimeter drain. Discharges from the borrow pit to surface water at the site are regulated under General WDR Order R5-2013-0073-01/NPDES NO. CAG995002 (*General Waste Discharge Requirements for*

Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Super chlorination Projects, and Other Limited Threat Wastewaters to Surface Water, adopted on 6 June 2014).

UNSATURATED ZONE CONDITIONS

58. The thickness of the unsaturated zone at the site varies depending on various factors such as surface elevation, groundwater elevation, and depth of fill. Outside of the landfill units, the thickness of unsaturated zone ranges from about 36 feet on the western side of the facility where the groundwater table has been pumped down to about eight feet on the eastern side of the facility where the water table is not affected by pumping. Beneath the landfill units, the unsaturated zone consists of the vertical space between the bottom of the landfill unit and top of the water table or capillary break or barrier layer, as applicable. The unsaturated zone thickness below the landfill ranged from 3.9 feet to 27.6 feet in 2014 as detailed in Finding 90 and 91.
59. The capillary rise in the water table at the site is estimated to range seasonally from about two to six feet depending on soil type. Capillarity may also be present in some areas near the ground surface from surface water infiltration.

Soil Gas

60. In 2003, as part of a corrective action program for LF-3 the Discharger installed seven landfill gas monitoring probes (GP-2 through GP-8) along the perimeter of the landfill units (about 50 feet from the facility perimeter) on the western side of the site to define LFG concentrations in the unsaturated zone and the potential for LFG migration. Subsequent monitoring showed relatively high methane concentrations along the western perimeter of LF-1 and southwestern perimeter of LF-3. Prior to landfill gas extraction at the site, in probe GP-8 along the northwestern corner of LF-1, for example, methane was detected up to 88% at an average concentration of about 57%. Probe GP-8 was subsequently found to have been installed in waste; the probe was destroyed and replaced by GP-9, which has not had methane since it was installed in 2005. Similarly, in probe GP-3B along the southern perimeter of DM-2.2, methane was detected once at 58% in 2005 with an average concentration of 6%; GP-3B has been 0% methane since 2012 and 0.1% methane or lower since 2010.
61. In 2008, the Discharger installed several landfill gas monitoring probes along the facility perimeter to comply with new landfill gas monitoring regulations (Title 27, Section 20917 et seq), but continued to monitor GPs-2, 3, 4, and 5, as required under previous WDRs. The facility's perimeter gas monitoring system currently consists of 18 gas monitoring probes at locations spaced approximately 1,000 feet apart per solid waste regulations (Title 27, section 20919 et seq.), including 16 shallow gas probes (GPs-1, 6, 7, 9 through 19, 20S and 21S) and two deep probes (20D and 21D). The shallow probes were installed to average depths of about 11 feet bgs and the deep probes to average depths of about 27 feet bgs. See Attachment F: Landfill Gas Controls & Monitoring.
62. The Discharger conducted quarterly monitoring of soil gas probes installed along the

perimeter of the facility in accordance with Title 27 solid waste regulations and previous WDRs. Historical monitoring of the gas probe generally indicated non-detect methane concentrations along the facility perimeter and elevated methane concentrations along the landfill unit perimeters prior to start-up of the LFG extraction system in 2010. LFG concentrations generally declined to non-detects along the unit perimeters by 2014. Only one of the perimeter gas monitoring wells, GP-21S, installed in 2009 west of LF-1, has indicated elevated historical methane concentrations (up to about 33%), and since 2011, this well has been non-detect for methane.

63. To ensure that soil pore gas is being adequately monitored for the presence of LFG and to monitor the effectiveness of the LFG extraction system, these WDRs require that the Discharger install a sufficient number of gas monitoring probes along the landfill unit boundaries. See Provisions I.9.a and I.9.c. The MRP further requires that the Discharger conduct soil pore gas monitoring on all existing and future facility gas probes, unit perimeter gas probes, and pan lysimeters installed within the capillary break layer beneath the LCRS sumps of the units at the site. As in previous WDRs, the MRP requires that the Discharger conduct field monitoring for total organic vapors, and sample for VOCs if such vapors exceed a given trigger level (i.e., $\geq 1\%$ methane and/or ≥ 1 ppmv total organic vapors).

Soil Pore Liquid

64. The Discharger does not conduct soil pore liquid monitoring at LF-1 because no soil pore liquid monitoring device was installed at the partially-lined unit when it was constructed and it is not feasible to retrofit the unit's LCRS sump with a pan lysimeter. Soil pore liquid monitoring of LF-2 is performed using a suction lysimeter that underlies the LCRS sump. Soil pore liquid monitoring at the site also includes the pan lysimeters installed at LFs-3, 4, and WP-9.1. Pressure transducers installed in the pan lysimeters allow for measurement of the amount of liquid in each pan lysimeter. The volume of liquid pumped from the pan lysimeters is also recorded.
65. The soil pore liquid monitoring systems at the classified units at the site may be summarized as follows:
- a. LF-1 – No lysimeter installed beneath unit's LCRS sump.
 - b. LF-2 – Suction lysimeter installed beneath unit.
 - c. LF-3 – DMs-2.2 and 11 -- Pan Lysimeters installed within capillary break beneath LCRS sumps
 - d. LF-4
 - i. DM-5.1 -- Pan Lysimeters installed within capillary break beneath LCRS sumps.
 - ii. DMs-3, 4, 5.2, and 6 -- Pan Lysimeters welded to the bottom of the secondary LCRS sumps.
 - e. WP-9.1 – Pan Lysimeter installed within capillary break beneath LCRS sump.

66. VOC-impacted liquid has been historically detected beneath the primary LCRS sumps at all of the classified units at the site, including LF-2; LF-3 (DMs-2.2 and 11); LF-4 (DMs-3, 4, and 5) and WP-9.1. The highest concentrations of total VOCs in such liquid were detected at LF-3, DM-11 (185 µg/L) and LF-4, DM-3.3 (178 µg/L), while the most liquid was recovered from DM-2.2A (11,350 gal/year). Some of these detections are associated with confirmed releases investigated and addressed under previous WDRs, while others are recent and/or intermittent detections. The history and status of these releases at the site are summarized in the Corrective Action section of these WDRs.
67. The monitoring and reporting program (MRP) under these WDRs requires that the Discharger monitor all existing and future pan lysimeters installed beneath LCRS sumps as part of soil pore water monitoring, and all pan lysimeters welded to the base of overlying sumps as part of leak detection monitoring. See Attachment E: Leachate & Soil Pore Liquid Monitoring.

GROUNDWATER CONDITIONS

68. Shallow groundwater at the site generally occurs in the underlying fluvial sediments consisting of interbedded sands, silts, and clays. . The depth to groundwater at the site varies from about 5 to 36 feet below ground surface (bgs), averaging about 10 feet bgs or 10 feet above MSL. The greatest depth to groundwater occurs in the western portion of the site, where the water table has been artificially depressed by the dewatering of the borrow pit.
69. Groundwater flow at the site is believed to be greatest in localized, permeable layers that are interconnected by direct contact or through sandy silt and clay layers. These layers have been confirmed to be one hydrogeological unit.. The average hydraulic conductivity for these sediments range from 5×10^{-3} cm/sec to 9.4×10^{-7} cm/sec⁷. The known thickness of the monitored saturated zone is about 80 feet, based on monitoring well screen elevations.
70. In the western portion of the site, the natural groundwater flow direction is to the southwest, due to the borrow pit de-watering, which creates a radial gradient of about 0.013 ft/ft toward the borrow pit on the western half of the site. The onsite borrow pit west of LF-1 has been excavated below the water table and must be de-watered in the wet season to allow further soil removal. Groundwater pumped from the borrow pit is used in various site operations, including irrigation, dust control, and composting. Groundwater pumped from the borrow pit is also discharged to surface water (under an NDPES permit) via the onsite drainage system. The rate of groundwater pumped from the onsite borrow pit has historically averaged about 85 million gallons per year (about 233,000 gpd).

⁷ Source: 2015 Annual Monitoring Report

71. In the middle of the site, a transition between the west and east flow regimes may exist. In this area, groundwater flows to the south and the gradient is relatively flat (about 0.001 ft/ft). The average groundwater elevation in this area is about 16.5 feet MSL (or 7 feet bgs). This flow boundary is not well defined, due to a lack of monitoring devices in this area.
72. On the eastern half of the site, groundwater resumes its natural course to the southeast at about 0.0013 ft/ft consistent with the regional flow direction and gradient. Groundwater elevations on the eastern half of the site range from about 18.5 feet MSL (9 feet bgs) northwest of WP-9.1 to about 13.5 feet MSL (8 feet bgs) southeast of LF-4.
73. Background groundwater quality in the uppermost aquifer at the site is relatively hard, and exceeds secondary drinking water MCLs for chloride, TDS, and sulfate. The following background data is based on Second Half 2014 sampling data reported for wells G-6 (west half of site) and G-4R, G-17, and/or G-18 (east half of site).

Background Groundwater Quality – Uppermost Aquifer	Units	East Half of Site	West Half of Site
TDS	mg/L	1,770	1,000
Specific Conductance	µmhos/cm	2,430	1,370
Chloride	mg/L	420	120
Sulfate	mg/L	320	110
Bicarbonate Alkalinity ⁸	mg/L	495	570

74. The beneficial uses of underlying groundwater stated in the Basin Plan are municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.
75. The groundwater monitoring system at the landfill units currently includes ten LF-1 monitoring wells (G-6, G-7, G-8, G-9, G-10, G-10R, G-10M, P-1, MW-4, and 4BR), nine LF-2 & LF-3 monitoring wells (4BR, G-1, G-2, G-11, G-11R, G-11M, G-12, G-13, and G-27), and ten LF-4 monitoring wells (D-7, G-16, G-17, G-18, G-20, G-25, G-26, G-28, G-29 and G-30). About 23 of these wells are along the Point of Compliance of each unit, while the remaining wells are background monitoring wells. Additional groundwater monitoring wells monitor WP-9.1 (i.e., G-4R, G-19R, G-21, G-22, G-23, and G-38) and the LTU (G-19R and G-26). Currently, five of these wells are corrective action wells: G-21, G-22, G-23, G-8 and G-9. See Attachment D: Groundwater Monitoring.
76. Several monitoring wells, including many of the wells used to monitor the landfill units, WP-9.1 and/or LTU also monitor remediation of a nitrate-N plume on the western and eastern halves of the site under a separate General Order. Eleven of these wells (i.e.,

8. Some of the bicarbonate alkalinity detected upgradient of LF-1 could also be associated with landfill gas impacts from LF-1.

D-4, 4BR, and G-2, G-10R, G-10M, G-11M, G-11R, G-27, G-35, G-36, G-37) monitor the portion of the plume on the west side of the site and eleven of the wells (i.e., G-16, G-19R, G-20, G-25, G-26, G-28, G-29, G-30, G-32, G-33, G-34) monitor the portion of the plume on the east half of the site, See Attachments D & I. It is noted that the extent of the nitrate-N plume has not yet been fully defined; the Discharger will be conducting that action outside of the requirements of this Order.

77. Historical groundwater monitoring data prior to 2010 for the western half of the site indicates the intermittent detection of several VOCs in landfill Point of Compliance wells. The source of the VOCs has not been determined. Some of the VOC detections were not verified by resampling in accordance with Title 27 CCR Section 20415(e)(8)(E). Some detections were single trace detections, the result of the use of contaminated well construction materials, and/or the result of sample or lab contamination, as shown by equipment blank and method blank analyses. VOC types intermittently detected in the highest concentrations included alcohols & ethers (e.g., tert-Butyl Alcohol and Methyl tert-Butyl Ether (MTBE)), ketones (e.g., acetone), Freon compounds (e.g., Dichlorodifluoromethane or Freon 12), and various halogenated VOCs (e.g., Vinyl chloride, Chloromethane, and Iodomethane). The data also indicated sporadic detections of a few semi-VOCs (e.g., Bis-2-ethylhexyl Phthalate). Since 2010, however, significantly fewer VOC detections occurred, and VOCs have been non-detect in most of the wells.
78. WP-9.1 has been in corrective action monitoring program since 2001 due to a leachate release that caused nitrate-N and other nitrogen compound impacts to groundwater and the unsaturated zone. In 2015, for example, nitrate-N was detected up to 18 mg/L in groundwater extraction well G-22 along the downgradient perimeter of WP-9.1, compared to its concentration limit of 5 mg/L. Similar nitrate-N impacts have also been detected in monitoring well G4R immediately west of WP-9.1. In addition, WP-9.1, the LTU, and the composting facility have been noted as possible sources of two other nitrate-N plumes currently undergoing remediation at the site. In addition to the foregoing nitrate-N exceedances, barium has been detected immediately downgradient of LF-1 (i.e., in well G-8) at average concentrations exceeding its concentration limit and is in corrective action monitoring.
79. Volatile organic compounds (VOCs) are often detected in a release from a MSW landfill and are often associated with releases of landfill gas rather than leachate. Since VOCs are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a landfill unit. Title 27, sections 20415(e)(8) and (9) allow the use of a non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a landfill unit in accordance with Title 27, sections 20415(b)(1)(B)(2 - 4).
80. The Central Valley Water Board may specify a non-statistical data analysis method pursuant to Title 27, section 20080(a)(1). Water Code section 13360(a)(1) allows the

Central Valley Water Board to specify requirements to protect groundwater or surface waters from leakage from a solid waste site, which includes a method to provide the best assurance of determining the earliest possible detection of a release. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a landfill unit, the SPRRs specify a non-statistical method for the evaluation of monitoring data for non-naturally occurring compounds.

The MRP under these WDRs specifies the data analysis methods applicable to monitoring data for the site based on information provided in the JTD and other relevant file information. For VOCs and other organic compounds (as well as for inorganic compounds not present in background) a non-statistical method is specified for detection monitoring consistent with Title 27, section 20080(a)(1).

81. For a naturally occurring constituent of concern (i.e., inorganic constituents present in background), Title 27 requires concentration limits for each constituent of concern be determined either by calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8) or by an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).
82. Title 27 specifies the prescriptive requirements and performance standards applicable to monitoring data analysis and requires that such methods be implemented as follows:
 - a. As specified in the existing MRP under the WDRs; or
 - b. In accordance with a technical report (certified by an appropriately registered professional) documenting such methods, submitted to, and approved by, the Central Valley Water Board; or
 - c. In accordance with any water quality data analysis software deemed appropriate for such use by either the Central Valley Water Board or SWRCB.

See Title 27, section 20415, subparagraphs (e)(7) and (e)(10).

83. In April 2002, the Discharger submitted a *Sampling and Analysis Plan (SAP)* under previous WDRs proposing statistical and nonstatistical detection monitoring methods for the facility. (The SAP also details the field and laboratory procedures for the collection and analysis of samples.) For naturally occurring inorganic constituents (i.e., general minerals) on the western half of the site, the SAP proposed an intrawell detection monitoring approach (i.e., each well functioning as its own background well). The report stated that lower quality background water from younger alluvium on the east side of the site was being drawn into wells on the west side of the site by borrow pit pumping, making it infeasible to detect a release from partially-lined unit LF-1 and other modules on the west half of the site. Water Board staff subsequently approved the SAP and the proposed intrawell detection monitoring method was incorporated into subsequent WDRs. In a 7 April 2016 Notice of Violation, Board staff found that the Discharger was

deviating from its SAP⁹ during monitoring events in 2014 and 2015. Among other items, the Discharger was to submit an amendment to the SAP by 1 May 2016.

84. Title 27, section 20390 requires that the Central Valley Water Board establish a Water Quality Protection Standard (WQPS) in the WDRs for each unit, including Constituents of Concern (COCs), Concentration Limits, Point of Compliance, and Monitoring Points. The current WQPS does not reflect the revised unit designations under these WDRs. Also, several of the elements of the WQPS for the facility (e.g., monitoring points, concentration limits) were submitted and approved under previous WDRs as separate documents rather than as a single WQPS report.

These WDRs require that the Discharger develop and submit for Water Board staff approval a revised WQPS Report that describes each element of the WQPS for each classified unit at the site consistent with the requirements of this Order, including a demonstration that the use of intrawell monitoring is consistent with Title 27, Section 20080(b) and (c), and if not consistent with Title 27, proposes to change the detection groundwater monitoring to interwell comparisons using hydraulically upgradient wells as background. These WDRs also require that the Discharger submit an updated Sample Collection and Analysis Plan consistent with the revised WQPS Report and other relevant requirements of these WDRs.

85. For corrective action monitoring, the monitoring program specifies intrawell statistical and/or nonstatistical procedure (e.g., time series plots, trend analysis) to evaluate the effectiveness of corrective action. To demonstrate that corrective action has been completed (i.e., concentrations along Point of Compliance returned to compliance with the water quality protection standard), Monitoring Specification H.7 specifies a “proof” period. As required by Title 27, Section 20430(g), during this period, the Discharger must demonstrate that all constituents of the release have been reduced to concentration limits for at least eight monitoring events during one year. The monitoring events may occur as frequently as once per month.

GROUNDWATER SEPARATION

86. Title 27, section 20240(c) requires that all new landfills and waste piles be “sited, designed, constructed, and operated”, and that all existing landfills be “operated”, to ensure that wastes will be a minimum of five feet above the highest anticipated elevation of underlying ground water (i.e., Title 27 prescriptive standard for groundwater separation). Section 20260(a) further requires that Class III landfills be located where site characteristics provide adequate separation between nonhazardous solid waste and waters of the state (i.e., Title 27 performance standard for groundwater separation).

⁹. The last Sample Collection and Analysis Plan submitted under previous WDRs was the March 2013 report *Sample Collection and Analysis Plan. Recology Hay Road Landfill*, prepared by Golder Associates, Inc..

87. Previous WDRs approved and/or prescribed requirements for engineered alternative designs for groundwater separation (EAD/S) allowing for less than the 5-foot minimum prescriptive standard groundwater separation required under Title 27, section 20240(c), as summarized below.
- a. WDRs Order No. 89-178 allowed for a 3-foot minimum separation provided that the module design included a composite base liner (geomembrane overlying CCL) that satisfied Chapter 15 (now Title 27) engineered alternative design criteria and was approved by the Board under revised WDRs. The western portion of DM-1 (DM-1B) and all of DM-2.1 (DMs-2.1A and -2.1B) were subsequently constructed in accordance with this EAD/S, as approved under WDRs Order No. 95-202.
 - b. WDRs Order No. 95-202 also approved a 2½ foot minimum EAD/S for Class II expansion modules that specified a one-foot gravel capillary break layer beneath the base liner system. WDRs Order No. 97-145 subsequently reduced the required capillary break thickness to 1/2-foot, effectively reducing the EAD/S to 2 feet, but retained a requirement that at least 2.5 feet of separation be maintained at the modules. The modified EAD/S included geocomposite capillary break layer designs for the perimeter levee side-slopes.
 - c. WDRs Order No. R5-2003-0118 approved a modified 2½ foot minimum EAD/S that included a geomembrane capillary barrier layer in lieu of a gravel capillary break layer.

In each of the above designs, the Discharger demonstrated, to the satisfaction of the Central Valley Water Board, that the siting, design, and construction of a containment system meeting Title 27 prescriptive standards for a minimum of 5 feet of groundwater separation was infeasible due to naturally high groundwater at the site; that the proposed EAD/S was consistent with the performance goal addressed by the prescriptive standard; and that it afforded equivalent or better protection against water quality impairment associated with a release.

88. No EAD/S was approved for LF-1 under previous WDRs and the unit was required to be operated (i.e., de-watered) in accordance with Title 27 prescriptive requirements (i.e., 5 feet minimum separation between wastes and groundwater). In the mid-1990s, the Discharger initiated pumping of the borrow pit west of LF-1 in an attempt to de-water both contiguous units. Pumping of the borrow pit subsequently lowered the water table below the elevation of the base of the dewatering trench rendering the dewatering trench dry.
89. These WDRs require that all new LF-3 and new LF-4 landfill modules, with the exception of DM-7.2, be designed and constructed with additional containment features and a minimum of 5 feet of groundwater separation. The Discharger is also required to operate all new LF-3 and LF-4 landfill modules, with the exception of DM-7.2, so as to maintain at least 5 feet of separation from the lowest elevation of the waste (e.g., primary LCERS sump) to the highest anticipated elevation of underlying groundwater, including capillary fringe, at that location. The Discharger is also required to install

piezometers outside the liner limit adjacent to each LCRS sump that allow for measurement of the groundwater table.

90. Quarterly groundwater elevation monitoring conducted on the west half of the site in 2014 indicated the following groundwater separation distances at each LCRS sump of each unit/module.

Unit	Module	Required GW Separation (feet)		LCRS Sump Elevation (feet NGVD29)	Avg. GW Elevation (feet NGVD29)	Approx. Separation (feet)	Avg. GW Elevation (feet NGVD29)	Approx. Separation (feet)
		Design	Operational ¹					
West Half of Site					First Half 2014⁴		Second Half 2014⁴	
LF-1	DM-1A	5		n/a ²				
	DM-1B	5		5.6	-0.5	5.5	-0.2	5.2
LF-2	DM-2.1A/B	3	3	24.9 ³	13.5	11.4	11.2	13.7
LF-3	DM-2.2A	2.5	2.5	26.1	-1.5	27.6	-0.2	26.3
	DM-2.2B	2.5	2.5	25.7	10.5	15.2	8.4	17.4
	DM-11.1	2.5	2.5	25.3	17.0	8.3	13.5	11.9
	DM-11.2	2.5	2.5	24.7	17.0	7.7	14.3	10.4
	Future	5	5	---	---	---	---	---

1. Required minimum operational separation under this Order.
2. DM-1A not constructed with LCRS sump -- bottom of waste defined in Facility Specification C.1.a.
3. Both modules drain to common sump. See Finding 108.
4. Average of reported quarterly groundwater elevations and corresponding separation from waste.

The above data indicates that in the First and Second Half of 2014, minimum groundwater separation on the western half of the site, was about 5.5 feet at DM-1B (DM-1B), 11.4 feet at LF-2, and 7.7 feet at LF-3, DM-11.2. Based on the above-listed minimum required operational separation distances under this Order for existing modules (equal to the EAD/Ss approved under previous WDRs), adequate separation appeared to exist during this period at all landfill units/modules on the western half of the site, with the exception of DM-1. As described in the Amended 13301 Order, the Discharger had been reporting separation to groundwater at sump S-1. However, previous investigations had indicated that, based on three borings by EMCON in 1984 (borings S-19, S-20, and S-21), the lowest elevation of the waste is in the north-central side (in the unlined portion of the unit), and a review of the groundwater maps in the monitoring reports shows between 2009 and 2013, groundwater was consistently reported by the Discharger to be approximately 15 feet above the waste. The Amended 13301 Order requires that the Discharger implement its proposal to lower the groundwater to at least five feet below the waste and conduct monitoring to demonstrate effectiveness. The Discharger prepared an Engineering Feasibility Study (Golder November 2015), which proposed, among other items, to remove the waste in the vicinity of the 1984 borings.

91. The eastern half of the site is not influenced by pumping from the borrow pit and no de-

watering of modules on the eastern half of the site has been historically conducted. Quarterly groundwater elevation monitoring conducted on the east half of the site in 2014 indicated the following groundwater separation distances at each LCRS sump of each unit/module:

Unit	Module	Required GW Separation (feet)		LCRS Sump Elevation (feet NGVD29)	Avg. GW Elevation (feet NGVD29)	Approx. Separation (feet)	Avg. GW Elevation (feet NGVD29)	Approx. Separation (feet)
		Design	Operational ¹					
East Half of Site					First Half 2014⁴		Second Half 2014⁴	
LF-4	DM-3.1	2.5	2.5	20.3	14.0	6.3	13.6	6.7
	DM-3.2	2.5	2.5	19.9	14.0	5.9	13.7	6.2
	DM-3.3	2.5	2.5	20.9	17.0	3.9	15.5	5.4
	DM-4.1	2.5	2.5	20.4	13.5	6.9	13.7	6.7
	DM-5.1A	2.5	2.5	21.5	15.5	6.0	13.9	7.6
	DM-5.1B	2.5	2.5	21.3	14.0	7.3	14.5	6.9
	DM-5.2	2.5	2.5	22.1	17.0	5.1	15.8	6.3
	DM-6	2.5	2.5	23.1	17.0	6.1	16.6	6.5
	DM-7 ²	2.5	2.5	---	---	---	---	---
	Future ⁵	5	5	---	---	---	---	---
WP-9.1	WP-9.1A	2.5	2.5	25.3	19.0	6.3	18.3	7.0
	WP-9.1B ³	2.5	2.5	25.3	17.0	8.3	17.5	7.8
LTU-1	---	5		23.0	17.0	6.0	17.0	6.3

1. Required minimum operational separation under this Order.
2. DM-7 is composed of two phases designed with an EAD/S of 2.5 feet. DM-7.1 was constructed in 2014 and is operating with a temporary, shallow LCRS sump. The permanent LCRS sump will be installed during construction of DM-7.2. Upon completion of construction of both phases, DM-7 will operate with the approved EAD/S of 2.5 feet.
3. Units/modules currently undergoing clean closure in preparation for construction of LF-4, DM-9 in this area.
4. Average of reported quarterly groundwater elevations and corresponding separation from waste.
5. Future LF-4 modules include DM-2.3, DM-8, DM-9, DM-10, and DM-11.3.

The above data indicates that in the First and Second Half of 2014 the minimum groundwater separation, was about 3.9 feet MSL at LF-4 (DM-3.3), 6.3 feet MSL at WP-9.1, and 6.0 feet MSL at the LTU. Based on the above-listed minimum required separation distances under this Order for existing modules, adequate separate appeared to exist at all existing classified units/modules on the eastern half of the site. However, as described in the Amended 13301 Order, the Prosecution Team contends that the Discharger had been using the wrong point at which to measure the separation for module DM 3.3, and that between 2011 and 2014, separation ranged between 0.35 feet and 1.1 feet, which is less than the required 2.5 feet of separation. The Prosecution Team's groundwater separation calculations used the bottom of the leak detection layer to calculate groundwater separation. This Order clarifies that the groundwater separation is measured between the lowest elevation of wastes (i.e. leachate in the primary LCRS sump) and the elevation of the underlying groundwater.

The Discharger has agreed to take actions to lower the groundwater under DM 3.3 and to monitor for effectiveness.

92. In response to the October 2014 13301 Order issued under previous WDRs, the Discharger submitted a 15 May 2015 *Revised Groundwater Separation Delineation Workplan* to the Central Valley Water Board describing the methods it planned to use to determine the amount of separation of waste to groundwater at LF-1 and LF-4, DM-3.3 per the EAD/Ss approved under previous WDRs. The data developed from the Workplan was then used to prepare an Engineering Feasibility Study to evaluate alternatives to achieve compliance with the separation criteria. The Discharger submitted the EFS on 13 November 2015 and the corrective action proposals proposed therein were approved and incorporated into the October 2014 13301 Order, as amended by the Central Valley Water Board on 19 February 2016.

The amended 13301 Order requires, among other items, that the Discharger install six new piezometers to monitor groundwater separation at DM-1A and a French drain along the northern border of DM-1A to help dewater the module. The Order also requires that the Discharger lower the outlet on the Bird Sanctuary in the southeast corner of the site to maintain the required separation for DM 3.3¹⁰. The amended Order also requires that the Discharger operate and maintain the French Drain and Bird Sanctuary, once installed, in a way that maintains the separation of waste to groundwater in DM-1 and DM 3.3. The amended 13301 Order also includes various monitoring and reporting requirements associated with these tasks.

UNIT DESIGN AND CONSTRUCTION

93. On 17 June 1993, the State Water Board adopted Resolution 93-62 implementing a State Policy for the construction, monitoring, and operation of MSW landfills that is consistent with the federal municipal solid waste regulations promulgated under 40 Code of Federal Regulations section 258 (Subtitle D). Resolution 93-62 requires the construction of a specified composite liner system at new MSW landfill units that receive wastes after 9 October 1993. Resolution 93-62 also allows the Central Valley Water Board to consider the approval of engineered alternatives to the prescriptive standard. Section III.A.b of Resolution 93-62 requires that the engineered alternative liner systems be of a composite design similar to the prescriptive standard.
94. Title 27, section 20080(b) allows the Central Valley Water Board to consider the approval of an engineered alternative design (EAD) to the Title 27 prescriptive standard. In order to approve an engineered alternative in accordance with Title 27, sections 20080(c)(1) or (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in Title 27, section 20080(b), or would

¹⁰ The Discharger has recently stated that permitting requirements by other agencies make it not possible to lower the outlet, and therefore the Discharger will take other actions to lower the groundwater under DM 3.3.

be impractical and would not promote attainment of applicable performance standards. The Discharger must also demonstrate that the proposed engineered alternative liner system is consistent with the performance goal addressed by the particular prescriptive standard, and provides protection against water quality impairment equivalent to the prescriptive standard in accordance with Title 27, section 20080(b)(2).

95. 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.

Liner Performance Demonstration

96. On 15 September 2000 the Central Valley Water Board adopted Resolution No. 5-00-213 *Request For The State Water Resources Control Board To Review The Adequacy Of The Prescriptive Design Requirements For Landfill Waste Containment Systems To Meet The Performance Standards Of Title 27*. The State Board responded, in part, that “a single composite liner system continues to be an adequate minimum standard” however, the Board “should require a more stringent design in a case where it determines that the minimum design will not provide adequate protection to a given body of groundwater.”
97. In a letter dated 17 April 2001, the Executive Officer notified Owners and Operators of Solid Waste Landfills that “the Board will require a demonstration that any proposed landfill liner system to be constructed after 1 January 2002 will comply with Title 27 CCR performance standards. A thorough evaluation of site-specific factors and cost/benefit analysis of single, double and triple composite liners will likely be necessary.”
98. The Discharger submitted a *Liner Performance Demonstration Report for DM-4.1 and Future Class II Liner Systems* dated 15 April 2003. The base liner design for Disposal Module 4.1 (DM-4.1) and future Class II disposal modules at Recology Hay Road Landfill was proposed as follows (from top to bottom):
- 12-inch thick operations layer;
 - 8-oz. Geotextile filter layer;
 - LCRS gravel layer at least 6 inches thick;
 - 60-mil HDPE geomembrane;
 - 2-foot thick compacted clay liner with a permeability of 1×10^{-7} cm/s or less;
 - 6-inch thick foundation soil layer;
 - Leak detection geocomposite;
 - 60-mil high density polyethylene (HDPE) geomembrane liner; and
 - Compacted subgrade comprised of fined-grained soils.

The side-slope liner system was proposed as follows (from top to bottom):

- 1.5-foot minimum operations layer;

- LCRS geocomposite;
- 60-mil HDPE geomembrane;
- A geosynthetic clay liner (GCL) with 30-mil geomembrane; and
- Compacted subgrade comprised of fined-grained soils.

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

99. The demonstration compared efficiencies and leakage potential of six different liner system designs. A total leakage potential of 1.04 gallons was calculated throughout the life of the landfill (operations and 30-year post-closure period) for the 14-acre (DM-4.1) cell. In addition, a cost-benefit analysis was performed which showed that additional liner components would cost significantly more without significantly less leakage potential. As such, the demonstration concluded that a more stringent liner system is not warranted since the proposed system will meet the performance requirements of Title 27 CCR because it exemplifies the prescriptive standard with an additional leak detection component.

Landfill 1

100. Landfill 1 is an “existing unit” under Title 27 and currently consists of DM-1A and DM-1B. No additional LF-1 modules are planned for the unit given that it will ultimately be surrounded by LF-3.
101. DM-1A is a 29.7-acre, unlined landfill unit in the northwest portion of the site. The rectangular-shaped unit is about 1,000 feet wide (east-west) and 1,550 feet long (north-south). The unit does not have an LCRS. The average base of waste elevation is about 20 feet MSL, with a potentially deeper waste area in the northern portion of DM-1 near the entrance road. The maximum elevation of the unit is currently about 130 feet MSL, corresponding to about 100 feet above surrounding grade. The maximum height of the waste column in DM-1A is estimated to be about 100 feet. The upper and lower side slopes of the unit (i.e., north, east, and south) average about 2.5H:1V and 4.5H:1V, respectively, while the top deck is graded at about 3 percent toward the perimeter. The western side of the unit is contiguous with DM-1B.
102. By 1982, groundwater intrusion into the pit at DM-1A had become an operational problem. In an attempt to create an inward-gradient landfill for the DM-1A area, the Discharger constructed a slurry wall around the permitted disposal area on the western half of the site (i.e., LFs-1, 2 & 3 areas). The slurry wall was constructed using low permeability soil excavated from a borrow area within the slurry wall immediately west of

DM-1A (i.e., future DM-1B area) and admixed with bentonite.¹¹ A de-watering trench was then installed within the slurry wall along the west side of the permitted area to de-water the pit. See Attachments C & D. Subsequent de-watering operations did not prevent groundwater intrusion into the pit, however, and by 1987, the Discharger had abandoned attempts to expand DM-1A's subsurface disposal pit by dewatering.¹²

103. DM-1B is a 14.8-acre, Class III landfill unit constructed in the former borrow area immediately west of DM-1A.¹³ The unit consists of a single, rectangular shaped (about 500 feet wide and 1,550 feet long) disposal module referred to as DM-1B. The unit/module was constructed with a compacted clay base liner and an overlying, 6-inch gravel LCRS. Additional containment system components were constructed along the western portion of the unit to create a 175-foot wide, 6-acre lined area.

104. DM-1B's waste containment system may be summarized as follows, from top to bottom:

Module:	DM-1B	
Phase:	Compositely-Lined Portion	Clay-Lined Portion (MSW)
Area (acres)	6	8.8
Operations Layer	12 inches soil ¹	
Filter Fabric	Geotextile ²	
LCRS	6-inches gravel ¹	
Base Liner	60-mil HDPE Geomembrane	none
	12-Inch Compacted Clay Liner (CCL) ¹ (k < 1x10 ⁻⁶ cm/sec)	
Foundation Layer	Compacted soil ¹	
Underdrain	De-watering Trench ³	none

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.

2. Geotextile consists of 8 oz/yd² non-woven fabric.

3. De-watering trench filled with drainage gravel.

105. The LCRS layers for both portions of the unit (i.e., DM-1A and DM-1B) drain to a single LCRS sump located along the western side of the unit. The de-watering trench was also included in the design to allow for groundwater de-watering to meet groundwater separation requirements. In 1996, the Discharger initiated groundwater pumping from

11. Well logs indicated that the excavation was within a perched shallow aquifer underlain by a clay layer extending from about 4 bgs on the east side of DM-1A to about 30 feet bgs on the west side of the borrow area. The slurry wall was keyed about 4 feet into the underlying clay layer.

12. The failure of the slurry wall to prevent groundwater intrusion into the pit indicated that the slurry wall was not an effective barrier to groundwater and/or that the aquifer underlying the unit may not have been perched as had been assumed.

13. Taken together, LFs-1A & 1B formed an approximate square with 1,550 foot long sides.

the large borrow pit immediately west of DM-1B, eliminating the need for operation of DM-1B's de-watering trench.

106. The maximum elevation of DM-1B, occurring along its interface with DM-1A, is about 110 feet MSL and the maximum thickness of the waste column at the unit is about 115 feet. The upper side slopes of the unit average about 2:5H:1V, except for the lower portion of the southern slopes, which average about 4:5H:1V.

Landfill 2

107. LF-2 is a Class III landfill unit constructed in 1992 in the southwestern part of the site. The Title 27 landfill unit consists of disposal modules DM-2.1A and DM-2.1B. No additional LF-2 modules are planned for the unit given that it will ultimately be surrounded by LF-3.

108. The base of LF-2 (DM-2.1A) was graded in the shape of an inverse pyramid draining to a central LCRS sump. A composite base liner was installed to qualify for a 3-foot minimum EAD/S approved under previous WDRs Order No. 89-178. The thickness of the CCL component was increased to three feet at the LCRS sump.

DM-2.1A's containment system components may be summarized as follows, from top to bottom:

	Base Liner	
	Sump Area	Floor
Operations Layer	12 inches soil ¹	
Filter Fabric	Geotextile	
LCRS	5 feet gravel ¹	1-foot gravel
Base Liner	80-mil HDPE Geomembrane ²	60-mil HDPE Geomembrane ²
	36-inch CCL ^{1,3}	12-inch CCL ^{1,3}
Foundation Layer	Re-compacted native soil ¹	

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.

2. Single side textured geomembrane used with textured side down.

3. $K < 1 \times 10^{-6}$ cm/sec.

The base sections for both phases were graded to a 2 percent grade toward the central LCRS sump, which was plumbed to an 18-inch riser pipe extending along the top of the base liner to an access point/collection tank along the southern perimeter of the unit. The LCRS also included perforated 6-inch diameter leachate collection pipes placed diagonally and across the module at the base of the pea gravel. No capillary break layer was included in the design because the module was constructed with greater than the requisite 3-foot minimum separation from high groundwater at the LCRS sump.

109. DM-2.1B is 7.1-acres and was constructed in two phases in 1993 and 1994, respectively. DM-2.1B's containment system components may be summarized as follows, from top to bottom:

	Base Liner		Perimeter Levee	
	Phase 1 (as constructed DM-2.1, Phase 2)	Phase 2 (as constructed DM-2.1, Phase 3)	Phase 1 (as constructed DM-2.1, Phase 2)	Phase 2 (as constructed DM-2.1, Phase 3)
Operations Layer	12 inches soil ¹			
Filter Fabric	Geotextile			
LCRS	12 inches gravel ^{1,2}		Not applicable	
Base Liner	60-mil HDPE Geomembrane ³			
	12-inch CCL ^{1,4}	24-inch CCL ^{1,5}	12-inch CCL ^{1,4}	24-inch CCL ^{1,5}
Foundation Layer	Re-compacted native soil ¹		Re-compacted berm soil ¹	

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.
2. $K > 1$ cm/sec per project specifications.
3. Single side textured geomembrane used with textured side down.
4. $K < 1 \times 10^{-6}$ cm/sec per project specifications.
5. $K < 1 \times 10^{-7}$ cm/sec per project specifications.

No capillary break layer was included in the design because the module was constructed with greater than the requisite 3-foot minimum separation from high groundwater.

Landfill 3

110. LF-3 is a Class II landfill unit currently consisting of two disposal modules -- DM-2.2 and DM-11. Additional LF-3 expansion modules are planned for future construction north of the existing LF-3 modules, including, but not necessarily limited to, DM-10 in the area presently used for composting.

111. DM-2.2 was constructed in 1995 in the southwest corner of the site immediately west of DM-2.1B. The 11.8-acre expansion module was constructed in accordance with engineered alternative designs for groundwater separation (EAD/S) and waste containment (EAD/L) approved under previous WDR Order No. 95-269. The EAD/S included a minimum separation of 2½ feet from the bottom of the primary LCRS (including primary LCRS sumps) to the highest anticipated elevation of groundwater, including capillary fringe. The EAD/L included the substitution of geosynthetic clay liner (GCL) for one foot of compacted clay in the composite base liner and two feet of clay in the composite side slope liner. Sideslope containment was required along perimeter levee slopes and slopes abutting Class III landfill LF-2.

112. DM-2.2's containment system components may be summarized as follows, from top to bottom:

	Base Liner	Side Slopes	
		Perimeter Levee	DM-2.1B Interface
Operations Layer	12 inches soil ¹	18 inches soil ¹	
Filter Fabric	Geotextile	---	
LCRS	12 inches gravel ^{1,2}	---	Geocomposite drainage strips ³
Cushion Layer	Geotextile Cushion ⁴		
Base Liner	60-mil HDPE Geomembrane ⁵		
	GCL ⁶		
	12-inch CCL ¹	---	
Foundation Layer	6-inches soil ¹	---	6-inches soil ¹
Capillary Break	12-inches gravel ^{1,2}	Geocomposite ²	---
Subgrade	Re-compacted native soil ¹		---

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.
2. $K > 1$ cm/sec per project specifications.
3. Geocomposite consists of geonet bonded to geotextile filter layer.
4. Geotextile cushion layer consists of 16 oz/yd² non-woven fabric.
5. Single side textured geomembrane used with textured side down.
6. $K < 5 \times 10^{-9}$ cm/sec per project specification...

The base of each module phase was graded with a 2 percent cross slope toward central LCRS header pipes (sloped at one percent) draining to LCRS sumps located on the southern and western perimeters of the module.

113. DM-11 was constructed in two phases in 1997 (DM-11.1) and 1998 (DM-11.2), respectively. Both phases of the 14.6-acre module were constructed consistent with modified EADs for groundwater separation and liner (i.e., modified EAD/S and EAD/L) approved under WDR Order No. 97-145, which reduced the required thickness of the capillary break and LCRS layers to six inches each. The modified EAD/L also reduced the containment system requirements for side slopes abutting portions of Class III LF-2. Notwithstanding the reduced EAD/S, WDR Order No. 97-145 retained the requirement that the Discharger maintain 2.5 feet of operational separation at the module.
114. DM-11's containment system components may be summarized as follows, from top to bottom:

	Base Liner	Side Slopes	
		Perimeter Levee	DM-2.1B Interface
Operations Layer	12 inches soil ¹	18 inches soil ¹	
Filter Fabric	Geotextile	Geocomposite	---
LCRS	6-inches gravel ^{1,2}		
Base Liner	60-mil HDPE Geomembrane ⁴		
	GCL ⁵		
	12-inch CCL ⁵	---	---
Foundation Layer	6-inches soil ¹	---	6-inches soil ¹
Capillary Break	6-inches gravel ^{1,2}	Geocomposite	n/a
Subgrade	Re-compacted native soil ¹	---	n/a

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.
2. $K > 1$ cm/sec per project specifications.
3. Cushion layer eliminated on levee sideslope to increase interface shear strength of base liner.
4. Single side textured geomembrane used with textured side down.
5. $K < 5 \times 10^{-9}$ cm/sec per project specifications.

The base of each module phase was graded with a 2 percent cross slope toward central LCRS header pipes (sloped at one percent) draining to two LCRS sumps located on the southern perimeter of the module. See Attachment E: Leachate & Soil Pore Liquid Monitoring.

115. The Discharger has proposed to construct future LF-3 modules consistent with previous WDR approvals for LF-3. These WDRs specify a design for constructions of new LF-3 modules that includes a double liner like LF-4, an increase in design separation to 5 feet, and a capillary break layer in those areas where the base elevation of the liner will be below the calculated capillary rise plus the required five feet of separation from groundwater. See Construction Specifications E.1 through E.7.

Landfill 4

116. LF-4 is a Class II landfill unit and currently consists of 5 disposal modules -- DMs-3 through -7. Additional LF-4 modules are planned for future construction west of the existing LF-4 modules, including, but not necessarily limited to, DM-9 in the area presently used for stockpiling and drying sludge (i.e., WP-9 and LTU-1).
117. DM-5 was constructed in two phases, including DM-5.1 (2001) and DM-5.2 (2004), respectively. DM-5.1 (11.9 acres) was constructed in accordance with the design for LF-3, DM-11 approved under previous WDRs (see Finding 113), except that no interface containment system was necessary because the module was not adjacent to a Class III unit. The base of DM-5.1 was graded with a 2 percent cross slope toward central LCRS header pipes (sloped at one percent) draining to two LCRS sumps located on the eastern perimeter of the module. DM-5.2 (8 acres) was constructed in accordance with

the design for DM-4.1 described below and similarly graded to drain to a single LCRS sump located on the northern perimeter of the module.

118. DM-4 was constructed immediately south of DM-5 along the eastern side of the facility. The 18.4-acre module was constructed in three phases over a 10-year period, including DM-4.1 (2003), DM-4.2 (2006) and DM-4.3 (2013), respectively. All three phases were constructed in accordance with the 2½-foot minimum EAD/S approved under previous WDR Order No. 95-269 and the revised EAD/L approved under previous WDR Order No. R5-2003-0118. The approved EAD/L consisted of a double composite base liner system and a single composite perimeter sideslope liner system. The thickness of the containment system was used to satisfy the minimum 2½-foot separation requirement under the EAD/S.

119. DM-4's containment system components may be summarized as follows. from top to bottom:

	Base Liner	Perimeter Levee Sideslope
Operations Layer	12 inches ¹	18 inches ¹
Filter Fabric	Geotextile	Geocomposite
LCRS	6-inches gravel ^{1,2}	
Base Liner	60-mil HDPE Geomembrane ³	
	24-inch CCL ⁴	GCL ⁴
Foundation Layer	6-inches soil ¹	---
Secondary LCRS	Geocomposite	---
Secondary Liner/ Capillary Barrier Layer	60-mil HDPE Geomembrane ³	---
Subgrade	Re-compacted native soil ¹	

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.
2. $K > 1$ cm/sec per project specifications.
3. Geomembrane double-side textured over base liner and single side textured (textured side down) on side slopes.
4. $K < 5 \times 10^{-9}$ cm/sec per project specifications.

The base of DM-4.1 was graded with a 2 percent cross slope toward central LCRS header pipes (sloped at one percent) draining to an LCRS sump installed on the eastern perimeter of the facility. Consistent with the approved revised EAD/L, LFG collection pipes were also installed within the LCRS layer to allow for future connection to LFG control system, as needed. An electrical leak location survey was also conducted as part of the construction CQA to verify the integrity of the primary liner system.

120. No LCRS sumps were constructed at either module phase DM-4.2 or DM-4.3, which were graded to rely on other modules/module phases for leachate drainage. The northern part of DM-4.2's LCRS was graded to drain north into DM-5.2's LCRS, while

the remainder of DM-4.2's LCRS was graded to drain east into DM-4.1's LCRS. DM-4.3's LCRS was graded to drain east into DM-4.2's LCRS.

121. DM-3 was constructed immediately south of DM-4 in the southeast corner of the facility. The 21.6-acre module was constructed in three phases, including DM-3.1 (2008), DMs-3.2 (2010), and DM-3.3 (2010), respectively. All three phases of the module were constructed in accordance with the EADs approved for DM-4 and subsequent modules under previous WDRs (e.g., double liner, secondary LCRS, 2½-foot minimum separation). The LCRS for each phase was also graded and constructed similarly to DM-4, except that each of the three phases of the module was constructed with its own LCRS sump located along the southeast corner of the facility. See Attachment E: Leachate & Soil Pore Liquid Monitoring.
122. DM-6 was constructed immediately west of DM-5 in the eastern part of the former LTU-1 area clean-closed in 2011. The 12.1-acre module was constructed in two phases in 2012 (DM-6.1) and 2013 (DM-6.2), respectively. Both phases of the module were constructed with the same double-lined containment system design as that for DMs-3 and 4, as approved under previous WDRs. Both phases were contiguously graded to drain to a single LCRS sump located on the northern perimeter of the facility/DM-6.1.
123. The LCRS sumps for the LF-3 and LF-4 landfill modules were generally constructed to a maximum depth of 1.5 feet with 3H:1V side slopes. Each sump was equipped with a dedicated submersible pump, including liquid level sensor and 18" HDPE riser pipe for sump access and pumping. External pump controls with electronic displays were also installed to allow for monitoring the sumps and adjusting the pump controls. The system also included level switches set at minimum and maximum allowable liquid levels to ensure safe pump operation and to prevent head buildup on the liner beyond the sump. Volume pumped is also automatically recorded. All pump control systems are powered by solar cells installed near each module/sump. For modules with a secondary LCRS, a secondary riser pipe was also installed to allow for pumping any liquid detected.
124. All components of the LCRS layers at DM-1B and LFs-2 through 4, including gravel or geocomposite blanket layers, lateral and/or header piping, LCRS sump, control systems, and handling facilities were designed to meet Title 27 performance standards using appropriate engineering methods and models (e.g., Hydraulic Evaluation of Landfill Performance (HELP) Model Version 3.07, pipe flow calculations).
125. DM-7 is being constructed in two phases along the southern perimeter of the site immediately south of DM-4 and west of DM-3. The first phase of the module, DM-7.1 (5.9 acres), was constructed in 2015 immediately south of DM-4.3 with the same double-lined containment system design as DMs-3, 4, and 6 described above. The base of the module was graded to drain to the south at a 1% slope with a 2% cross slope toward a central leachate header pipe. The second phase of the module, DM-7.2 (3.5 acres), anticipated to be constructed in 2018, will continue the 1% base grade of DM-7.1, allowing for at least 2½ feet of groundwater separation at an LCRS sump to be

constructed at the toe of the module consistent with previous approvals.

126. No LCRS sump was constructed at the toe of DM-7.1 to avoid the need to abandon and relocate the sump when DM 7.2 is constructed and tied into the module. Instead, the module was equipped with a temporary leachate extraction system consisting of an 18-inch HDPE riser pipe plumbed directly into the module's LCRS blanket layer. The riser pipe was installed along a temporary, lined soil berm constructed along the southern side of DM 7.1. An automatic, submersible pump capable of detecting leachate pressure and liquid level was installed in the riser to pump and convey the leachate via pipeline to LF-4's tank farm west of WP-9. One 2-inch HDPE water injection pipes will also be installed in the north end of the LCRS to enable annual LCRS testing.
127. The Discharger has proposed to construct future LF-4 modules consistent with previous WDR approvals for LF-4. These WDRs specify a containment system design for new LF-4 modules that is the same as for those described for LF-3 for the base liner and side-slope liner. Additional liner components are required beneath the sumps for new LF-4 modules. See Finding 115 and Construction Specifications E.1 through E.7.

Slope Stability

128. On 13 March 2015, in response to a requirement under 13301 Order R5-2014-0117, the Discharger submitted a technical report providing updated slope stability analysis of the landfill's temporary fill slopes (see 13 March 2015 *Temporary Fill Slope Stability Technical Report, Recology Hay Road Landfill*, prepared by Golder Associates, Inc.). The report included an updated seismic hazard assessment, a review of the liner design and shear test parameters for each landfill module, identification of the temporary fill slopes associated with the modules consistent with the landfill's fill plan, and analysis of the stability of these slopes under both static and dynamic conditions, as required under previous WDRs and Title 27 regulations. The temporary fill slopes included the southern and eastern slopes of LF-1, which the Discharger plans to regrade to 4H:1V; the northern slope of LF-2; the northern and eastern slopes of LF-3; and the western (DM-4.3 and 7.1), southern (DM-7.2), and eastern (DM-4.1) slopes of LF-4. A total of eight critical cross-sections were evaluated along these slopes, including two at LF-1, one at LF-2, two at LF-3, and three at LF-4.
129. Slope stability analysis was performed on the above cross sections using the SLIDE© (Version 6.029) software program developed by Rocscience, Incorporated. The program performs two-dimensional limit equilibrium analysis using the method of slices to compute factors of safety based on various analysis procedures. Spencer's Method of Slices was used to compute the static safety factors. Critical interface failure envelopes were developed for the modules based on the laboratory shear results from module CQA testing and other factors. Computed minimum static safety factors for the interim fill slopes included 3.1 at LF-1, 3.4 at LF-2, 1.6 at LF-3 (DM-2.2), and 1.8 at LF-4 (DM-7.1), indicating stable interim slopes under static conditions.
130. To evaluate the dynamic stability of the interim slopes, the yield acceleration was

determined by applying a seismic coefficient until the factor of safety equaled 1.0. A seismic coefficient of 0.58 g was used in the analysis based on the design earthquake for the site. Once the yield acceleration was determined, the method of Bray et. al (1998) was used to estimate the seismic displacements. Maximum calculated seismic displacements using this method were <1 at LFs-1 and -2, 15.3 inches at LF-3 (DM-2.2), and 5.1 inches at LF-4.

131. The 15.3-inch calculated displacement for LF-3 exceeded the 12-inch maximum allowable displacement recommended under EPA guidelines for dynamic slope stability. To address this issue, the report included a work plan to widen and/or increase the height of the existing soil buttress along the northern side of LF-3, DM-2.2 to increase its seismic stability. The work plan proposed installation of soil borings and geotechnical testing of the berm to determine its shear strength and other parameters. Once this information was obtained, additional dynamic slope stability analysis would be performed to determine the necessary dimensions for the berm. The Discharger has since completed the geotechnical investigation, as approved, and determined, based on revised geotechnical parameters, that northern side of LF-3, DM-2.2 is stable and that improvement of the buttress is not necessary.
132. Precipitation and drainage controls installed on the landfill units include:
- a. Top decks graded at 5% minimum for drainage.
 - b. Soil berms along top deck perimeter to direct runoff to corner drop inlets.
 - c. Overside drains to capture top deck and side slope bench drain flows.
 - d. Ditches installed alongside slope benches to intercept and convey sheet flow runoff to overside drains. Benches also graded for sheet flow runoff.
 - e. Landfill perimeter ditches to convey collected runoff to onsite storm water basins.
 - f. Velocity controls (e.g., erosion control blanket, rip rap) at appropriate locations in bench drains and landfill perimeter ditches to reduce erosion.

Construction reports historically submitted for the landfill units certified that the module designs (including precipitation and drainage controls) meet Title 27 requirements.

Waste Pile 9.1

133. WP-9.1 was originally constructed as disposal module DM-9.1 in 1997, the first LF-4 disposal module constructed on the eastern half of the site immediately east of the composting area. The 7-acre module represented the first phase of a 22.4-acre module (DM-9) planned for that area. In 1998, the module was converted for use as a sludge storage facility and in 2001 was reclassified (under previous WDRs Order No. 5-01-101) as a Class II waste pile. The east half of WP 9.1 is currently undergoing clean closure and upon completion DM-9.1 will be constructed as part of Unit LF-4.
134. WP-9.1 was constructed with the same engineered alternative designs as DM-11, including minimum groundwater separation and base liner and perimeter levee

sideslopes. See Findings 113 and 114. As with DM-11, WP-9.1 was graded with a 2 percent cross slope toward central LCRS header pipes (sloped at one percent) draining to two LCRS sumps located along the northern perimeter of the module. See Attachment E: Leachate & Soil Pore Liquid Monitoring.

135. Three engineered, 9-to-12 foot high soil berms tied into the operations layer were also constructed along the south, east, and west sides of the module, respectively, for additional sludge containment. The berms were constructed using C-Soil capped with one-foot of borrow clay and graded with 2H:1V interior and exterior side slopes. Calculations in the JTD indicate that the berms would be stable under both static and dynamic loading conditions. The failure surface was the interface between the underlying LCRS and geosynthetic liner.

As described in the 18 November 2015 WP 9.1 CQA report, partial clean closure activities began in 2015. The liner components in the eastern portion of WP-9.1 were removed. A new perimeter berm was constructed within the remaining western portion of WP-9.1. A new 60-mil high-density polyethylene (HDPE) geomembrane was installed on the outer portion of the containment berm. The purpose of this geomembrane is to seal the edge of the leachate collection and removal system (LCRS) gravel layer consistent with the existing WP-9.1 design. This project has reduced the footprint of WP 9.1 by more than 50%. The remaining western portion of WP 9.1 is now designated WP 9.1A.

136. An access road and tipping pad was constructed on the southern side of WP-9.1 for offloading de-watered sewage sludge. Prior to reconfiguring the unit as part of the clean closure effort, the capacity of WP-9.1 was estimated to be 54,000 cubic yards of wet sludge, with three feet of freeboard from the top of the sludge to the top of the perimeter berms. The capacity of WP-9.1A is currently 18,300 cubic yards. All contact storm water collected within the waste pile berms is treated as leachate per Title 27 CCR Section 20365(b). All storm water diverted by the berms is directed to a perimeter storm water ditch along the northern side of the module, sized for a 1,000-year 24-hour storm.

Land Treatment Unit

137. The LTU was sited on a 20-acre area between DM-9 and DM-5 in the northeast corner of the site in the summer of 2000; however, LTU operations did not exceed a combined area of about 13 acres. The design included a 5-foot treatment zone below ground surface in which sludge constituents would be degraded, transformed, or demobilized. A field pilot to demonstrate the feasibility of the LTU in treating wastes per Title 27 CCR Section 20250(b)(5) was conducted prior to construction of the unit. De-watered WWTP sludge was applied to the test area to dry during the summer and lysimeters were placed immediately below the treatment zone to detect the possible migration of sludge constituents. The project results indicated that no sludge COCs were detected in samples collected below the treatment zone.

138. A soil pad was constructed within the LTU to facilitate placement and removal of sludge. The pad was graded for perimeter collection and drainage in the event of a design storm. All contact storm water is treated as leachate (i.e., collected in a sump in a corner of the unit and pumped to a leachate holding tank). A soil berm was also constructed around the LTU area for storm water diversion. Diverted storm water was directed to the perimeter ditch along the northern site boundary.
139. To date, all but 3.2 acres of the LTU area have been closed. The Discharger plans to clean close the remainder of the LTU in 2016 to make room for construction of LF-4, DM-9.

Composting Facility

140. The 22-acre compost facility pad, completed in 2006, consists of an all-weather working surface comprised of sections of concrete and foamed asphalt constructed over compacted subgrade. The subgrade was compacted to a maximum hydraulic conductivity of 1×10^{-5} cm/sec. The surface materials were selected to resist damage from heavy equipment, withstand the loads of compost piles, and prevent infiltration. The pad was designed for active composting and for the storage of finished compost.

Leachate Collection System

141. The composting pad was constructed with a leachate drainage system designed to capture and collect all compost leachate from the pad, including commingled storm water and/or wash water from dust and odor control operations. Leachate drainage controls installed at the facility included berms and swales, concrete-lined perimeter ditches, two leachate sumps, two leachate storage ponds, leachate storage tanks, and other drainage controls.
142. The asphalt-concrete-lined collection ditches were installed on the eastern end and concrete-lined collection ditches were installed on western ends of the pad to direct leachate from interior areas of the pad to lined sumps on the western and eastern ends of the pad.¹⁴ Drainage swales and/or concrete curbs were also installed in perimeter areas of the pad to help direct leachate to the concrete-lined perimeter ditches and prevent storm water run-on onto the pad. Both concrete-lined collection ditches were designed to handle flows from a 25-year, 24-hour storm event.

143. The leachate sumps at each end of the pad are equipped with pumps activated during

¹⁴ Contact storm water runoff from the green waste composting area historically drained to the sedimentation basin (i.e., former green waste pond) immediately south of the compost pad. However, this was not allowed by the previous WDRs. In 2014 (in partial response to the 13301 Order), the Discharger implemented various storm water drainage improvements at the composting facility, including construction of the concrete-lined ditch and sump on the western side of the facility to capture and contain drainage from the green waste composting area and prevent discharges from the pad to surrounding areas. See January 2015 *Amended Compost Area Storm water Modification Technical Report*, prepared by Golder Associates.

either low flow (e.g., minor storms) or higher flow periods (e.g., major storms). Each pump includes a float switch set at the appropriate low flow (≤ 2.75 feet) or high flow (≥ 3 feet) liquid level in the sump. One low flow pump is installed in both the east and west sumps, while a series of four high flow pumps are installed in the west sump and two in the east sump. The western sump and pump system is designed to handle flows from a 25-year, 24-hour storm event consistent with the General Composting Order, while the JTD indicates that the eastern sump and pump system needs to be upgraded with additional capacity to meet this standard.

These WDRs require that the compost leachate collection and pond systems are sized for a 25-year, 24-hour storm event, at a minimum. See Construction Specifications E.17.

144. During low flow storm events when the depth of liquid in both leachate sumps reaches 2.75 feet, the low flow pump in each sump activates. Leachate from the eastern sump is then pumped via a 4-inch line directly to Pond A (alternately referred to as the "low flow" pond), while leachate from the western sump is pumped via a 3- inch diameter pipe to the southeast corner of the eastern collection ditch. From there, the western sump leachate drains to the eastern perimeter sump from which it is pumped to Pond A. During higher flow storm events when the depth of liquid in each sump is at least 3 feet, leachate is pumped directly to Pond B (also referred to as "high flow" pond) via separate 12-inch diameter lines from each sump.
145. Leachate sampling of the compost facility conducted in 2010 indicated the following results:

Compost Facility Leachate Monitoring Data			
Inorganic Compounds			
Constituent	East Sump ¹	Pond A ²	Pond B ³
General Minerals (mg/L):			
Total Dissolved Solids	---	---	6,900
Chloride	---	---	1,600
Nitrate-N	---	---	14
Sulfate	---	---	320
Specific Conductance (µmhos/cm)	10,445	3,815	9,395
Nitrogen Compounds (mg/L)			
Total Kjeldahl Nitrogen	---	---	320
Ammonia	895	145	11
Nitrite	---	---	0.66
Other Parameters (mg/L)			
Total Suspended Solids	1,362	330	---
Biochemical Oxygen Demand	15,750	2,150	---
Chemical Oxygen Demand	32,000	3,900	---
Phosphorous	---	---	150
Dissolved Metals (µg/L)			
Lead	---	---	150

1. Average values from samples collected in February and April 2010.
2. Average of values from samples collected in February and April 2010.
3. Samples collected in November 2013
4. "---" denotes no sample collected at this monitoring point.

Leachate Pond System Design & Operation

146. Both Pond A and Pond B have been in operation since 2008. Pond A was constructed with a 40-mil HDPE geomembrane liner and has an estimated storage capacity of 389,000 gallons, excluding 1.2 feet of freeboard. Pond B was constructed with an 80-mil HDPE geomembrane and has a storage capacity of approximately 15.5 million gallons, excluding 2 feet of freeboard. Neither pond was constructed with an unsaturated zone monitoring device under the liner; however, Pond B is designed to store storm water run-off from a 25-year wet year. Aerators were also installed in Ponds A and B to maintain dissolved oxygen concentrations and to help prevent anaerobic conditions.
147. Pond A was also equipped with a float-controlled pump set to maintain a 1.2-foot minimum freeboard by pumping any excess flows to Pond B. For back-up overflow protection, Pond A was also constructed with a gravity discharge pipe placed at an elevation of 28.9 feet NGVD29, 0.5 feet below the minimum berm crest elevation of Pond A (29.4 feet NGVD29). The gravity discharge pipe discharges any excess liquid back to the eastern sump (15.6 feet NGVD29) from which it is pumped to either Pond B or into onsite storage tanks. Neither Pond A nor Pond B is plumbed to discharge to any surface water or sedimentation basin. (Pond B was formerly equipped with a gravity discharge pipe (3.0 feet below the berm crest) that discharged to the Compost Facility

sedimentation basin, but the pipe has since been capped).

148. Item 2 of Water Code Section 13301 Order R5-2014-0117 required that the Discharger submit either of the following:
- a. A Compost Ponds Re-configuration Technical Report documenting the implementation of sufficient facility modifications to ensure that compost area leachate is stored in Pond A and that storm water runoff is stored in Pond B such that they are not commingled, as described in previous WDRs; or
 - b. An amended RWD including a request that revised WDRs be issued that allow the current configuration of the ponds (e.g., commingling of compost leachate with storm water) and an interim technical report describing how the ponds will be inspected and managed to prevent pond overflows and unauthorized discharges to surface water.
149. In January 2015, the Discharger submitted an amended RWD for the composting facility requesting that the current pond configuration be incorporated into revised WDRs. The RWD included a January 2015 *Compost Pond Interim Overflow Management Plan*, prepared by Golder Associates per Item 2 of the Section 13301 Order. Key elements of the interim plan included the following:
- a. Action Level 0 – Normal pond operations, weekly inspections during wet season to check pond levels, no intervention.
 - b. Action Level 1 – When the liquid level in Pond A reaches an elevation of **28.5** feet NGVD29 (i.e., 0.9 feet below the minimum elevation of the berm crest), then:
 - i. Stop pumping leachate from the eastern sump to Pond A;
 - ii. Start pumping leachate from Pond A to Pond B (or to the onsite storage tanks, if necessary) until the liquid level in Pond A drops to **28.2** feet NGVD29 (i.e., 1.2 feet below the berm crest) or lower; and
 - iii. When completed, return to Action Level 0.
 - c. Action Level 2 – When/if the liquid level in Pond B reaches an elevation of **30** feet NGVD29 (i.e., 5.0 feet below the minimum berm crest elevation (35 feet NGVD29)), then
 - i. Increase drawdown of Pond B by beneficial reuse of Pond B liquid (e.g., compost moisturizing, dust control within compost pad area);
 - ii. Increase inspection frequency to daily and immediately after storm events;
 - iii. Contact wastewater treatment plants to arrange for offsite disposal, and/or stage temporary storage tanks at the site; and
 - iv. When completed, return to Action Level 1 or 0, as appropriate.
 - d. Action Level 3 -- When/if the liquid level in Pond B reaches an elevation of **32.5** feet NGVD29 (i.e., 2.5 feet below the minimum berm crest elevation), then;
 - i. Same as c.i above;

- ii. Same as c.ii above;
- iii. Commence hauling Pond B liquid to a WWTP or pump liquid to temporary storage tanks for future on-site use or offsite disposal; and
- iv. When completed, return to Action Level 2 or lower, as appropriate.

These WDRs require that the Discharger manage the composting facility's leachate collection/pond system in accordance with the above interim O&M plan pending submission and Board staff approval of a finalized O&M plan for the system (Composting Facility Leachate Collection System/Pond O&M Plan) reflecting any modifications to the interim O&M plan and all facility improvements implemented under the Compost Facility Leachate Collection/Pond System Improvement Plan. Action level reporting under the plans is required.

CORRECTIVE ACTION

150. Several units/areas at the site are currently in concurrent corrective action programs (CAPs) to address releases of specific waste constituents to groundwater and/or the unsaturated zone, including LF-1, LF-2, LF-3, LF-4, WP-9.1, LTU, and an area of the site impacted by a historical nitrate-N release. These impacted units/areas and corresponding corrective action measures are described below.

Nitrate-N Plume

151. In 2012, the Discharger installed groundwater monitoring well G-31 as a replacement for well G-14, which had been destroyed to allow for construction of DM-6. The groundwater sampling following installation indicated a nitrate-N concentration of 29 mg/l in the well, which is above the 5 mg/l concentration limit for nitrate. Nitrate-N exceedances (17 mg/L) were also detected on the west side of the site in well 4BR also installed and sampled in 2012. In response to this detection, the Discharger evaluated the feasibility of a permeable reactive barrier trench for remediation of nitrate in this area.. On 8 March 2013, Water Board staff issued a Notice of Violation (NOV) to the Discharger for the nitrate-N violations in these and other nearby wells. The NOV required, in part, that the Discharger perform a site investigation to delineate the nitrate-N releases and to establish a corrective action program.
152. In response to the NOV, the Discharger conducted a June 2013 investigation to delineate the nature and extent of the nitrate-N release, and defined elongated, nitrate-N plumes on the east and west sides of the site oriented in the direction of groundwater flow. See Attachment I: Nitrate-N Plume Map. Both identified nitrate-N plumes were downgradient of the Composting Area, WP-9.1, and LTU areas which were identified as possible sources given that they handle wastes/materials containing high concentrations of nitrogen compounds and that previous leaks and/or spills were documented from these units, including holes in the compost pond liners. Another possible source of the nitrate-N plumes noted in the report is the A-1 Channel, which runs along the north and east sides of the site and conveys irrigation tail water containing agricultural irrigation runoff, including nitrate. Note that the A-1 channel previously ran diagonally through DM-9.1 and DM-3. Well G-31 was subsequently

abandoned in June 2013, to allow for construction of DM-4.3.

153. Water Board staff subsequently approved a revised CAP proposing in-situ bioremediation for the nitrate-N releases via subsurface injection of an amendment to stimulate bioremediation based on a September 2013 EFS. The CAP required the Discharger to obtain coverage under General Order R5-2008-0149-056 (*General Waste Discharge Requirements for In-situ Groundwater Remediation at Sites with Volatile Organic Compounds, Nitrogen Compounds, Perchlorate, Pesticides, Semi-volatile Organic Compounds and/or Petroleum Compounds*). A Notice of Applicability for the corrective action under General Order R5-2008-0149-056 was issued by the Executive Officer on 17 December 2014.
154. The Discharger initiated groundwater remediation under the above General Order in May 2015. The groundwater remediation program included the injection of 20% sodium lactate into shallow groundwater in the affected areas to biologically degrade the nitrate. Injection points were spaced at approximately 70-foot intervals within rows spaced approximately 50 feet apart. The sodium lactate injections were performed over a two-month period using temporary, push-probe (i.e., Geoprobe) borings, which were grouted after extraction. The injection process was completed in May 2015. Six groundwater monitoring wells (G-32 through G-37) were also installed in treatment, transition, and compliance monitoring zones to monitor the effectiveness of the corrective action under MRP R5-2008-0149-056 of the General Order. See Attachments D & I.

The nitrate-N plume has not yet been fully defined, and the Discharger is required to continue investigations outside of the purview of this Order. These WDRs require that the Discharger continue active remedial measures necessary to cleanup the nitrogen-N release as required by General Order R5-2008-0149-056 or other corrective action measures until such time as the Discharger is able to complete the requisite proof period under Title 27/Subtitle D demonstrating that all release constituents have been reduced to concentration limits.

WP-9.1 & LTU Areas

155. In July 2000, nitrate-N-impacted soil pore liquid (about 395 mg/L) was detected in both pan lysimeters beneath WP-9.1 and subsequently confirmed as a release from the module. An electrical leak location survey conducted under a June 2001 EMP found a liner leak (about 4 inches by 6 inches) on the eastern side of the module that may have allowed leachate to enter the capillary break layer and/or the pan lysimeters.¹⁵ Interim corrective action measures included removal of the liquid from both pan lysimeters (about 6,900 gallons total), repair of the liner leak, and covering the exposed edges of the landfill module liner system with plastic sheeting to reduce the possibility of surface

¹⁵. See June 2001 *Amendment to Report of Waste Discharge and Establishment of Evaluation Monitoring Program, Pan Lysimeters PL-9.1A and PL-9.1B, B&J Drop Box Sanitary Landfill*, prepared by Conor Pacific/EFW.

water from entering the capillary break layer. Additional investigation was recommended.

156. An April 2002 follow-up EMP investigation (i.e., to define the nature and extent of the release) found nitrate-impacted soil below the landfill capillary break layer and in an area of erosion along the northeast corner of the module. The findings indicated that leachate had likely overflowed out of the module after exceeding the elevation of the WP-9.1 liner along the northeast and northwest perimeters. Additional corrective action measures included excavation of approximately 1,500 cubic yards of leachate-impacted soil and lining the module containment berms to seal off the LCRS layer so as to prevent future overflow of leachate from the module.
157. Concentrations of waste constituents historically detected in soil pore liquid at WP-9.1 since detection of the above leachate release are summarized in the following table:

WP-9.1 Historical Pan Lysimeter Data		
	WP-9.1A	WP-9.1B ¹
VOCs (ug/L)	<u>2001-2006</u>	<u>2001-2008</u>
Alcohols & Ethers	2.9	15.2
BTEX Compounds	1.3	0.4
Freon Compounds	0.6	0.1
Halogenated VOCs	3.8	1.4
Ketones	3.1	5.6
Other VOCs	5.1	1.9
Total VOCs:	16.8	24.6
General Minerals (mg/L)	<u>2000-2015</u>	<u>2000-2008</u>
Bicarbonate	406	502
Chloride	180	192
Nitrate	67	68
Sulfate	293	327
Total Dissolved Solids	1,464	1,508
Ammonia	---	25
Dissolved Metals (ug/L) ²	<u>2000-2015</u>	<u>1999-2005</u>
Arsenic	44.1	29.9
Chromium (total)	10.0	7.4
Iron	21,368	9,060
Lead	14.7	7.4
Manganese	533	240
Semi-VOCs (ug/L) ²	--- ³	---
Herbicides (ug/L) ²	---	---

1. Year or year ranges correspond to periods when constituents were continuously or intermittently detected. Note that since 2008, there has not been sufficient water to obtain a sample from PL-9.1B.
2. 5-year constituents of concern.
3. --- = not detected.
4. Note that average concentrations may not include non-detections and may not be representative.

158. The 2002 EMP also confirmed nitrate-N impacts to groundwater up to 30 mg/L in monitoring well G-21, which had recently been installed. In response, the Discharger installed new pumps, larger leachate storage tanks, additional LCRS pipes in the operation layer, and improved off-site leachate disposal capabilities. Grab groundwater samples obtained from temporary probes installed downgradient of well G-21 and adjacent to the northeast corner of WP-9.1 indicated lower, but still elevated, nitrate-N concentrations compared to background concentrations. The grab groundwater analytical results indicated that the area of nitrate-N impacts to groundwater is limited to the area immediately surrounding and approximately 150 feet downgradient of G-21.
159. Long term corrective action measures implemented at WP-9.1 in response to the groundwater release included installation of groundwater extraction well G-22 (about 10 feet downgradient of G-21) to remediate the release and two additional monitoring

wells, G-23 (adjacent to G-21, but screened in the next lower sand layer) and G-24 (about 200 feet downgradient of G-21) to monitor the effectiveness of the corrective action. Extraction of groundwater from well G-22 started up in June 2003. Between July 2014 and July 2015, approximately 1.07 million gallons of impacted groundwater was pumped from G-22 at an average extraction rate of about 2.0 gpm, which was close to the design extraction rate. Groundwater extracted from G-22 is either stored/used onsite for dust control or hauled to an offsite WWTP for disposal.

160. Under previous WDRs, wells G-21, G-22, G-23 and G-24 (abandoned in 2010) were sampled quarterly for specified field parameters and nitrate-N, the primary release constituent. Well G-21 was also monitored semi-annually for the routine detection monitoring parameters. Since 2011, the average Nitrate-N concentrations detected in wells monitoring WP-9.1 have decreased (i.e., from approximately 29 mg/L to 2.6 mg/L) in downgradient well G-21, remained relatively steady in monitoring well G-23 (1.8 mg/L) and extraction well G-22 (6.4 mg/L), and increased in downgradient well G-19R (4.1 mg/L). Nitrate-N concentrations have also increased during this period in well G-26 (5.2 mg/L) immediately downgradient of the adjacent LTU.
161. In light of above monitoring data, the Discharger submitted an 8 January 2016 work plan to improve delineation of the nitrate plume in the WP-9.1 and LTU areas. The work plan proposed the installation of a total of 22 temporary soil borings on grid patterns on the eastern half of WP-9.1 (i.e., WP-9.1B) and in the LTU area. Each boring would be advanced to first encountered groundwater and cased with 1-inch PVC. Grab groundwater samples would then be collected from each boring and analyzed for Nitrate-N and Nitrite-N. Step-out boring installation and sampling would then be conducted from all unbounded borings showing Nitrate-N exceedances to delineate the plume. Depending on the results of the investigation, a work plan proposing in-situ bioremediation under General Waste Discharge Requirements Order R5-2008-0149-056 similar to that described in Finding 153 would be submitted. Board staff conditionally approved the groundwater investigation for the eastern portion of WP 9.1 and the LTU in a letter dated 12 April 2016. The Discharger will soon be submitting a second workplan to delineate the nitrate-N plume in the remainder of the site.

LF-2 & LF-3

162. VOC-impacted soil pore liquid was detected in LF-2's suction lysimeter (VZ-2.1) during numerous monitoring events conducted from 1994 through June 2010, after which attempts to obtain samples from the lysimeter have failed. Total VOC concentrations detected during this period averaged about 74 µg/L, consisting primarily of alcohols & ethers (45 µg/L) and ketones (21.3 µg/L), and low to trace concentrations of other VOCs (7.6 µg/L). Previous (1997) WDRs required that the Discharger investigate the release and gas controls were ultimately installed at the module as the primary corrective action measure.
163. VOC-impacted pan lysimeter liquid was first detected in 1999 and subsequently confirmed at DM-2.2 (PL-2.2A) and DM-11 (PLs-11.1 & 11.2). In May 2001, the

Discharger submitted an *Engineering Feasibility Study* (EFS) for these modules in accordance with Title 27 CCR Section 20420(k)(6), based on the results of an Evaluation Monitoring Program (EMP) under previous WDRs Order No. 5-01-101. The EFS concluded that the VOC-impacted liquid detected in the pan lysimeters was likely contact surface/storm water that infiltrated the gravel capillary break layer from the interior sides of the modules or similar infiltrated surface water impacted by LFG¹⁶.

164. Interim corrective action measures to address the releases at LF-2 and LF-3 have included covering exposed edges of the module during the rainy season, improved surface runoff controls, and pumping the pan lysimeter liquid back into the overlying LCRS sump. To eliminate the possibility of overcharging the LCRS sumps, the added pan lysimeter liquids were then immediately pumped from the LCRS sumps (by manually over-riding the liquid level controls) into the leachate tank farm storage.¹⁷ Long term corrective action measures implemented at the units have included the installation of several additional LFG monitoring probes in the LF-3 area (GP-2 through GP-8), borrow pit pumping to maintain groundwater separation in LF-1 area, and, in 2009, a site wide LFG extraction system in accordance with a May 2005 CAP approved in August 2005 by Central Valley Water Board staff.¹⁸

These WDRs require that any liquid detected in a leak detection sump or pan lysimeter be handled in accordance with response measures described in the LCRS Sump O&M Plan required to be submitted under WDR Facility Specification C.2.b, as approved. Additional corrective action measures may also be required in response to confirmation of a release. See Corrective Action Specifications D.1. through D.5.

165. Since the implementation of the above remedial measures, including LFG extraction in 2009, PLs-2.2A and 11.1 have been non-detect for VOCs, while VOCs have been intermittently detected in PL-11.2, generally at lower concentrations with less frequent detections. The concentrations of VOCs and other semiannual and 5-year constituents historically detected in pan lysimeter liquid recovered from LFs-2 and 3, including relevant time periods, are summarized in the following table:

¹⁶ The Water Code Section 13301 Order required the Discharger to evaluate its runoff and drainage controls to ensure that there were an appropriate number of downspouts to drain storm water away from the units. The Discharger's evaluation stated that the current runoff and drainage controls were sufficient.

¹⁷ The volume of pan lysimeter liquids discharged into and pumped out of the LCRS sumps was recorded to confirm that the volumes are comparable. In addition, the liquid level in the pan lysimeter is checked after pumping and recorded to aid in identifying future discharges into the pan lysimeter.

¹⁸ See 31 May 2005 report *Amended Report of Waste Discharge Proposing Corrective Action for Disposal Modules 2.1, 2.2 and 11 (DM-2.1, 2.2 and DM-11)*, Norcal Waste Systems Hay Road Landfill Inc., prepared by Golder Associates, Inc.

LF-2 & LF-3 Historical Lysimeter Liquid Data				
Unit: Lysimeter:	Average Constituent Concentration ¹			
	LF-2 ¹	LF-3 ¹		
	VZ-2.1 ²	PL-11.1 ³	PL-11.2	PL-2.2A ³
	<u>1994-2010</u>	<u>1999-2008</u>	<u>2000-2015</u>	<u>2002-2006</u>
VOCs (ug/L)				
Alcohols & Ethers	44.9	106.3	3.6	3.3
BTEX Compounds	1.1	3.1	3.5	0.5
Freon Compounds	0.8	1.2	0.5	---
Halogenated VOCs	3.9	---	---	---
Ketones	21.3	42.7	94.2	4.4
Other VOCs	<u>1.8</u>	<u>19.9</u>	<u>5.9</u>	<u>0.6</u>
Total VOCs:	73.8	184.6	109.7	11.1
General Minerals (mg/L)	<u>1994-2010</u>	<u>1999-2015</u>	<u>2000-2015</u>	<u>1999-2006</u>
Bicarbonate	1,272	704	1,012	1,138
Chloride	741	255	325	443
Nitrate	---	7	5	1
Sulfate	398	251	305	97
Total Dissolved Solids	2,962	1,606	1,951	1,854
Dissolved Metals (ug/L) ⁴	<u>1994-2010</u>	<u>1999-2015</u>	<u>2000-2015</u>	<u>1999-2005</u>
Arsenic	---	5.7	10.4	7.5
Iron	---	---	3,580.0	760.0
Manganese	---	2,535.0	2,995.0	4,100.0
Semi-VOCs (ug/L) ⁴	---	9.7	98.0	---
Herbicides (ug/L) ⁴	---	---	592.5	---

1. Year or year ranges correspond to period during which constituent was continuously or intermittently detected,
2. Suction lysimeter
3. Pan lysimeter
4. 5-year constituents of concern.
5. Note that average concentrations may not include non-detections and many not be representative.

LF-4

166. VOC-impacted liquid has also been historically detected in pan lysimeters at several modules of LF-4, including DM-3, PLs-3.1 (since 2015) & 3.3 (since 2013); DM-4, PL-4.1 (since 2006); and DM-5, PLs-5.1A (since 2001), 5.1B (since 2004), and 5.2 (since 2014). In a follow-up investigation of the release at DM-5, the Discharger concluded that the pan lysimeter liquid was not likely leachate or leachate-impacted based on differences in constituent concentrations and water chemistry. The Discharger attributed the source of the liquid detected in the pan lysimeters to possible surface water infiltration¹⁹ and implemented similar corrective action measures to those

¹⁹ The Water Code Section 13301 Order required the Discharger to evaluate its runoff and drainage controls to ensure that there were an appropriate number of downspouts to drain storm water away from the units. The Discharger's evaluation stated that the current runoff and drainage controls were sufficient.

implemented at LF-3 (e.g., remove liquid from pans, covering exposed edges of module liner, LFG extraction).²⁰ The Discharger has made similar findings based on investigations of the releases at the other LF-4 modules, although the investigation of PL-3.1 is still ongoing. The concentrations of VOCs and other semiannual and 5-year constituents historically detected in pan lysimeter liquid recovered from LF-4, including relevant time periods, are summarized in the following table:

LF-4 Historical Leak Detection Sump & Pan Lysimeter Liquid Data						
Lysimeter:	Average Constituent Concentration ¹					
	PL-3.1 ²	PL-3.3 ²	PL-4.1 ²	PL-5.1A ³	PL-5.1B ³	PL-5.2 ²
VOCs (ug/L)	<u>2015</u>	<u>2013 -2015</u>	<u>2006</u>	<u>2001-2015</u>	<u>2004-2011</u>	<u>2014</u>
Alcohols & Ethers	1.4	95.2	2.3	3.1	8.6	---
BTEX Compounds	0.5	2.8	1.4	---	0.5	---
Freon Compounds	---	4.7	---	0.1	1.9	1.8
Halogenated VOCs	0.7	12.6	2.6	5.0	4.2	---
Ketones	---	50.3	26.5	5.9	11.2	---
Other VOCs	<u>1.4</u>	<u>12.1</u>	<u>1.9</u>	<u>1.2</u>	<u>10.1</u>	-
Total VOCs:	4.1	177.7	34.7	15.3	36.5	1.8
General Minerals (mg/L)	<u>2015</u>	<u>2015</u>	<u>2006-2014</u>	<u>2001-2015</u>	<u>2004-2014</u>	
Bicarbonate	870	940	560	619	715	---
Chloride	82	100	116	131	149	---
Nitrate	0	---	0	22	1	---
Sulfate	4	2	92	274	342	---
Total Dissolved Solids	1,000	1,000	915	1,324	1,507	---
Dissolved Metals (ug/L) ⁴	<u>2015</u>	<u>2013</u>		<u>2001-2006</u>	<u>2004-2010</u>	
Arsenic	---	---	---	150.0	69.7	----
Chromium (total)	---	---	---	26.0	---	---
Iron	4,700	---	---	---	210.0	---
Lead	---	---	---	---	13.0	---
Manganese	7,100	---	---	555	2,750	---
Semi-VOCs (ug/L) ⁴	---	5.9	---	---	80.8	---

1. Year or year ranges correspond to period during which constituent was continuously or intermittently detected,
2. Leak detection sump/device (welded pan lysimeter)
3. Pan lysimeter
4. 5-year constituents of concern.
5. Note that average concentrations may not include non-detections and many not be representative.

²⁰. See July 2005 report *Investigation for Pan Lysimeters PL-2.2A, PL-5.1A, and PL-5.1B, Norcal Waste Systems Hay Road Landfill Inc.*, July 18, 2005.

The corrective action specifications of these WDRs specify actions that the Discharger must take in response to the detection/confirmation of liquids in a leak detection device or pan lysimeter.

Landfill Gas Controls

167. On 24 August 2005, Water Board staff issued a letter to the Discharger requesting that the Discharger submit design plans for installation of a landfill gas (LFG) extraction system to control LFG from LFs-2, 3 and 4 (DMs-2.1, 2.2, 11, and 5.1) at the facility. The letter was issued in response to evaluation monitoring reports confirming the presence of LFG in the unsaturated zone and LFG impacts to groundwater and/or pan lysimeter liquid at these units. The letter approved a work plan for a further corrective action investigation to design the system and specified a 15 September 2006 due date (ultimately extended to February 2008) for installation and startup of LFG extraction.
168. Water Board staff approved design plans for the proposed LFG extraction system submitted by the Discharger in a 2 November 2007 letter. The approved design included installation of nine LFG extraction wells, lateral and header piping, condensate sumps, a candlestick flare station, and other facilities. Carbon filtration canisters to remove VOCs from the gas stream were subsequently added to the design and constructed. The carbon filtration system was subsequently replaced with a gas-to-energy (GTE) plant, as described below.
169. The LFG extraction system started up in March 2009 and was subsequently expanded to address LFG issues at LF-1 and additional module development at LFs-3 & 4. At present, the LFG extraction system includes a total of 66 LFG extraction wells (11 at LF-1, four at LF-2, 19 at LF-3, and 30 at LF-4), five LFG condensate sumps, and associated collection piping. The LFG collection lines are also tied into the 3 leachate monitoring wells at DM-1A and 13 LCRS sump risers at the units. The system is drive by blower motors in a 1.5 megawatt onsite gas-to-energy (GTE) plant where extracted LFG is converted to electrical energy for offsite export. The GTE plant also includes a gas combustion engine, electrical generators, and an enclose flare. The flare is used for stand-by purposes and has its own 30 HP, 1,500 SCFM blower. The GTE plant's blower has a variable frequency drive set to operates at a maximum flow of about 580 SCFM. Additional LFG collection facilities will be installed at the site, as necessary, to meet landfill development and corrective action needs. See Attachment F: Landfill Gas Controls & Monitoring.
170. The current landfill gas extraction rate at the site is approximately 900 SCFM. Proportionately higher LFG extraction rates are anticipated as the landfill expands. Previous WDRs predated installation of the LFG system at the site and therefore did not require LFG extraction monitoring. Given that an LFG extraction system has since been installed at the site, the monitoring program in these WDRs requires that the Discharger conduct semiannual LFG extraction monitoring for parameters and constituents, including VOCs. The Discharger is also required to adjust or improve the LFG extraction system, as necessary, if monitoring data indicates that it is not

preventing gas migration from a unit/module.

ENFORCEMENT

171. Various directives (e.g., Notices of Violation, Executive Officer Orders) have been historically issued to the Discharger in response to the releases described above and other violations of existing or previous WDRs. Discharger responses to such directives have typically included implementing investigations and monitoring, repairs or improvements, corrective action, or responses to compliance schedules in revised WDRs.
172. On 9 October 2014, the Board issued Water Code Section 13301 Order R5-2014-0117 (amended on 19 February 2016) to the Discharger for various WDR violations and compliance issues, including composting operations, groundwater separation, precipitation and drainage controls, flood protection, and interim slope stability. Technical reports required under the 13301 Order included, but were not limited to, the following:
- a. Composting
 - i. *A Compost Area Storm Water Modification Technical Report*;
 - ii. *A Compost Ponds Reconfiguration Technical Report*; and
 - iii. *A Food Waste In-Vessel Composting Technical Report*, and
 - iv. *A Compost Leachate Dust Control Technical Report*; or (in lieu of ii, iii and iv)
 - v. *An Amended RWD* requesting revision of composting requirements in the WDRs
 - b. Groundwater Separation
 - i. Quarterly groundwater separation reports;
 - ii. CQA reports, including as-built drawings showing the bottom elevation of all units;
 - iii. *A Groundwater Separation Delineation Workplan*;
 - iv. *An Engineering Feasibility Study* to address groundwater separation at DM-1 and DM-3.1;
 - v. *A Groundwater Separation Implementation Report*
 - c. Other Reports
 - i. *A Runoff and Drainage Controls Technical Report*;
 - ii. *A Temporary Fill Slope Stability Technical Report*;
 - iii. *A Flood Protection Technical Report*; or, in lieu of iii, *An Amended RWD* requesting revision of flood control requirements in the WDRs

Discharger responses to the 13301 Order, including technical reports submitted under the 13301 Order, are described or referenced in the applicable Findings of this Order.

CLOSURE AND POSTCLOSURE MAINTENANCE

Landfill Units

173. The Title 27 prescriptive standard for MSW landfill final cover includes the following components, from top to bottom:
- a. Erosion Resistant Layer -- at least one foot of vegetative cover soil;
 - b. Barrier Layer (compositely-lined landfills only) – Geomembrane equivalent to geomembrane in composite base liner.
 - c. Low Hydraulic Conductivity (LHC) Layer -- Minimum one foot of compacted clay soil with a permeability less than or equal to the lesser of 1×10^{-6} cm/s or the permeability of underlying clay soil liner or natural geologic materials, as applicable;
 - d. Foundation Layer - at least two feet of materials (soil and/or waste) with appropriate engineering properties to support the overlying cover.

In lieu of the prescriptive cover design, the Discharger may construct an EAD provided that it meets the requisite demonstration under Title 27, section 20080(a) and is authorized under WDRs adopted by the Central Valley Water Board.

174. On 29 June 2015, the Discharger submitted a Preliminary Closure and Postclosure Maintenance Plan (PC/PCMP) for the landfill as part of the JTD. The PC/PCMP contained a conceptual plan for closure of the existing landfill disposal modules (i.e., DMs-1 through 11) as a single unit. The proposed closure activities would include grading and final cover installation; modifications and improvements to the landfill's monitoring systems and LFG control facilities; and various site improvements associated with landfill closure (e.g., drainage controls, demolition/decommissioning, survey monuments, site security). The PC/PCMP proposed an engineered alternative final cover design as follows:

<u>Component</u>	<u>Top Deck</u>	<u>Exterior Slopes</u>
Erosion Resistant Layer	1 foot vegetative cover soil ¹	
Barrier Layer	Geotextile Cushion ²	Geocomposite ³
	60-mil HDPE Geomembrane ⁴	
Low Hydraulic Conductivity (LHC) Layer	GCL ⁵	---
Foundation Layer	1 foot soil or appropriate materials ¹	

1. All cover soils/materials prepared/compacted in accordance with applicable project specifications.
2. Geotextile cushion layer consists of 10 oz/yd² non-woven fabric.
3. Geocomposite consists of geonet bonded to geotextile filter layer.
4. Geomembrane textured on both sides.
5. $K < 5 \times 10^{-9}$ cm/sec per project specifications.

175. The PC/PCMP included a preliminary demonstration under Title 27 that construction of a prescriptive final cover on the landfill would be infeasible due a significant shortage of

cover soil at the site, which would need to be imported for project construction. Construction of a prescriptive clay component would therefore result in significantly higher project costs than the use of GCL. The demonstration also noted that the use of GCL eliminated the need to compact the cover and reduced the strain on the foundation layer. As a result, only one foot of foundation soil was needed for the proposed EAD.

176. The PC/PCMP also included a hydraulic performance equivalency demonstration using USEPA's Hydrologic Evaluation of Landfill Performance (HELP) model (v. 3.07). The analysis assumed the use of drought-resistant annual grasses (i.e., grasses that would not require irrigation) as vegetative cover; a geomembrane installation defect frequency of 2 holes per acre (considered in the range of good industry practice) and other assumptions. The results of the analysis indicated a hydraulic infiltration rate through the final cover on the top deck of 0.14 gallons per acre per day (gpad) for the proposed EAD compared to 0.35 gpad for the prescriptive standard design. Calculated infiltration rates for the final cover on the side slopes were the same for both designs (0.01 gpad).
177. The proposed final cover would be graded at 4H:1V with the possible option of increasing the slope to 3.5H:1V on the lower 50 feet of the unit. Side slope benches (25 feet wide each) would be cut every 50 feet of vertical height per Title 27 requirements. The top deck of the unit would be graded at a 5% minimum slope to promote drainage and account for cover settlement, which could differentially reduce the drainage grade. The maximum elevation of the final cover would be 215 feet MSL.
178. The PC/PCMP also included slope stability analysis of the proposed final cover, including the potential for a failure surface to develop within the cover, landfill refuse, and/or underlying liner or foundation/subsurface soil. The analysis assumed an MCE of 6.9 for all modules consistent with previous analysis and shear strengths measured for the modules constructed to date. The results of the stability analysis indicated minimum static safety factors greater than 1.5 for all three failure modes under static conditions and permanent displacements of less than 1, 3, and 4 inches, respectively, for the foundation, refuse, and final cover failure modes.
179. LF-1 is nearing final grades for closure and will be required to stop accepting waste in 2021. These WDRs require the Discharger to submit a Final Closure and Postclosure Maintenance Plan (FC/PCMP) for LF-1, including plans and a schedule for closure of DM-1A and DM-1B. The FC/PCMP is due by 15 October 2019 and closure of LF-1 is required to be completed by 15 October 2021. See Closure and Postclosure Specifications F.1 & F.2.
180. For LF-1 cover slopes overlapped by the LF-3 sideslope liner as LF-3 is developed, these WDRs allow the Discharger to install a single containment system that functions as both LF-1 final cover and LF-3 side slope liner, provided that Title 27 performance standards are met.

181. In 1997 and 1999 the sideslope interface liner of LF-3 (DM-11.1) over LF-3 (DM-2.1B) and LF-2 (DM-2.1A) was constructed and approved for waste placement (see correspondence from CVRWQCB dated 19 December 1997, 7 June 1999 and 27 July 1999). In 2000 the sideslope interface liner of LF-3 (DM-2.2) over LF-3 (DM2.1B) and LF-2 (DM-2.1A) was constructed and approved for waste placement (see correspondence for CVRWQCB and dated 20 March 2001). For LF-2 cover slopes overlapped by LF-3 sideslope liner as LF-3 is developed, these WDRs allow the Discharger to install a single containment system that functions as both LF-2 final cover and LF-3 side slope liner, provided that Title 27 performance standards are met.
182. A Partial FC/PCMP is required to be submitted any time a portion of a unit has been sufficiently developed to constitute a closable phase.
183. Proposed landfill postclosure maintenance and monitoring activities included final cover maintenance; leachate management; maintenance and monitoring of LFG facilities; groundwater, vadose zone, and surface water monitoring; maintenance of precipitation and drainage controls; and other postclosure related activities. The PC/PCMP included plans to develop the areas currently occupied by LTU, WP-9.1, the Composting Area, and other undeveloped area on the eastern and western sides of the site.
184. Once every five years during the post-closure maintenance period, aerial photographic maps of the closed landfill area will be made to identify and evaluate landfill settlement. Iso-settlement maps will be prepared to determine the amount of differential settlement occurring over the previous five years. Pursuant to Title 27, section 21090(e)(2), this Order requires iso-settlement maps to be prepared and submitted every five years.
185. The completed final cover will be periodically tested for damage or defects by monitoring surface emissions pursuant to California Code of Regulations, Title 17, section 95471(c) and Title 27, section 21090(a)(4)(A). Defects will be repaired and tested for adequacy based on the closure CQA Plan.

WP-9.1 & LTU

186. Previous WDRs required that WP-9.1 be clean-closed at the end of its operating life prior to constructing DM-9.1 in that area. The LTU was also required to be clean closed at the end of its operating life. In 2011, the Discharger clean closed the portion of the LTU between WP-9.1 and LF-4, DM-5 (approximately 12 acres) in order to make room for construction of DM-6. The remaining 3.2-acre portion of the LTU immediately south of WP-9.1B continued to be operated.
187. In 2015, the Discharger ceased sludge discharges to the east half of WP-9.1 (WP-9.1B) in preparation to clean close the area. A berm separating the west and east halves of the unit was also constructed to provide containment for wastes discharged to the remainder of WP-9.1 (WP-9.1A). The decommissioning of WP-9.1B reduced sludge storage capacity of WP-9.1 to about 18,300 cubic yards.

188. On 10 June 2015, the Discharger voluntarily submitted a work plan for clean closure of WP-9.1B and the remaining portion of the LTU (*Workplan for Partial Clean-Closure of the Eastern Portion of Waste Pile (WP-9.1) and the Adjacent Land Treatment Unit*), stating that the Discharger planned to permanently discontinue sludge storage and drying operations in these areas. A 6 November 2015 revised version of the work plan was subsequently submitted in response to Water Board staff comments on the original plan. The revised clean closure work plan included plans for soil boring and collection of soil samples at intervals of approximately 100 feet to identify impacts; background sampling; and removal of any waste materials or impacted soil underlying the units.
189. In an 11 January 2016 letter, Water Board staff conceptually approved the above revised clean closure work plan on the condition that it address various concerns, including, but not limited to, the following:
- a. The need for advancement of the soil borings to underlying groundwater;
 - b. Grab groundwater sampling (i.e., at the corners and center of each unit);
 - c. Additional sampling along the southern perimeter of WP-9.1 and western, eastern, and northern perimeters of the LTU;
 - d. Angle boring and sampling beneath the soil berm separating WP-9.1A & B;
 - e. A decision tree/protocol for determining the lateral and vertical extent of impacted soil and what soil needs to be removed; and
 - f. A revised project schedule.

These WDRs require that the Discharger complete clean closure of WP-9.1B and the LTU in accordance with the above revised clean closure work plan, as conditionally approved by Water Board staff. Prior to beginning construction of the DM-9 geosynthetics, the Discharger shall remove impacted vadose zone materials and show one year of decreasing groundwater trends in the footprint of the proposed disposal module. The Discharger is also required to continue corrective action of Nitrate-N groundwater impacts in these areas.

FINANCIAL ASSURANCES

190. The Discharger is required to demonstrate financial assurances for closure and postclosure maintenance to the California Department of Resources Recycling and Recovery (CalRecycle) pursuant to Title 27, sections 22205 and 22210 (i.e., the landfill operated on or after January 1, 1988).
191. Title 27, sections 21820 and 22206 require a cost estimate for landfill closure. The cost estimate must be equal to the cost of closing the landfill at the point in its active life when the extent and manner of operation would make closure the most expensive. When closing units in phases, the estimate may account for closing only the maximum area or unit of a landfill open at any time. The 15 June 2015 PC/PCMP provided a lump sum cost estimate for closure of the entire landfill (i.e., the largest future area needing closure at any one time absent phased closure) consistent with Title 27, section 21820(a)(1)(b). The total estimated cost of landfill closure, including 20%

contingency, was \$26,724,439 in 2015 dollars. These WDRs require that the Discharger provide revised closure cost estimates in the appropriate closure plans required under this order for each landfill unit at the site. See Financial Assurance Specification G.1.

192. Title 27, sections 21840 and 22211 require a cost estimate for landfill post-closure maintenance. The 15 June 2015 PC/PCMP included a cost estimate for landfill post-closure maintenance/monitoring. The total estimated annual cost for post-closure maintenance/monitoring provided in the PC/PCMP, including 20% contingency, was \$252,496 in 2015 dollars. The corresponding 30-year cost was \$7,523,752 in 2015 dollars. These WDRs require that the Discharger provide revised post-closure cost estimates in the appropriate closure plans required under this order for each landfill unit at the site. See Financial Assurance Specification G.1.
193. Title 27 requires that the Discharger provide and maintain financial assurances to CalRecycle in at least the amount of the closure and postclosure cost estimates (i.e., in the currently approved PC/PCMP submitted under previous WDRs or this Order), as annually adjusted for inflation. The Discharger has established a Trust Fund approved by CalRecycle for closure and postclosure financial assurances per Title 27, section 22240. As of 2015, the balance of this trust fund was \$9,131,424 in 2015 dollars.
194. Title 27, section 22221 requires a cost estimate for corrective action of all known or reasonably foreseeable releases. On 14 July 2015, the Discharger submitted a cost estimate of \$1,546,311 in 2015 dollars for corrective action of all known or reasonably foreseeable releases at the landfill. (See 14 July 2015 report *Updated Corrective Action Cost Estimate for a Release to Water, Recology Hay Road Landfill*, prepared by EBA Engineering). The cost estimate was based on the costs of investigating and remediating a hypothetical release of VOCs to groundwater from a disposal module on the eastern half of the site (i.e., LF-4) where there is no groundwater dewatering. The VOC plume was assumed to be 1,600 feet long, 600 feet wide, and 10 feet deep with an average total VOC concentration of 50 µg/L. The treatment system would include liquid-phase granular activated carbon and an advanced oxidation or HiPOx reactor unit to treat alcohols and ethers (i.e., MTBE, tert- butyl alcohol) detected in landfill leachate. Treated groundwater would be discharged to a series of aboveground storage tanks (ASTs) for subsequent use for dust control, spray irrigation and/or composting operations. The proposed cost estimate was approved by Water Board staff on 11 January 2015.
195. The Discharger has established a Trust Fund approved by CalRecycle for corrective action financial assurances per Title 27, section 22240. As of 2015, the balance of this trust fund was \$868,158 in 2015 dollars. This Order requires that the Discharger maintain financial assurance with the CalRecycle in at least the amount of the approved corrective action cost estimate, as adjusted annually for inflation. See Finding G.3.

CEQA AND OTHER CONSIDERATIONS

196. The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resource Code section 21000, et seq., and the CEQA guidelines, in accordance with Title 14, section 15301.
197. This Order implements:
- a. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*;
 - b. The prescriptive standards and performance goals of California Code of Regulations, title 27, section 20005 et seq., effective 18 July 1997, and subsequent revisions;
 - c. State Water Board Resolution 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993, and revised on 21 July 2005.
 - d. The applicable provisions of Title 40 C.F.R. section 258 "Subtitle D" federal regulations as required by State Water Board Resolution 93-62.
198. The *Statement of Policy With Respect to Maintaining High Quality of Waters in California*, SWRCB Order WQ 68-16 (hereinafter "Anti-Degradation Policy") was adopted by the State Water Board in October 1968. Anti-Degradation Policy limits the Board's discretion to authorize the degradation of "high-quality waters." This policy has been incorporated into the Board's Basin Plans. "High-quality waters" are defined as those waters where water quality is more than sufficient to support beneficial uses designated in the Board's Basin Plan. Whether or not a water is a high-quality water is established on a constituent-by-constituent basis, which means that an aquifer can be considered a high-quality water with respect to one constituent, but not for others. (SWRCB Order No. WQ 91-10.)
199. Anti-Degradation Policy applies when an activity discharges to high quality waters and will result in some degradation of such high quality waters. When it applies, the Policy requires that WDRs reflect best practicable treatment or control (BPTC) of wastes and that any degradation of high quality waters (a) will be consistent with the maximum benefit to the people of the State, and (b) will not result in an exceedance of water quality objectives. If the activity will not result in the degradation of high quality waters, Anti-Degradation Policy does not apply, and the Discharger need only demonstrate that it will use "best efforts" to control the discharge of waste.
200. Anti-Degradation Policy does not apply to the discharge of waste to Recology Hay Road Landfill. The requirements of this Order are designed to ensure that any such wastes remain contained at the facility and will not reach waters of the State. The requirements of this Order reflect the Discharger's best efforts to control such wastes.
201. Facilities under WDRs are classified for the purposes of determining the annual permit fee and WDR update cycle. These classifications are based on threat to water quality and complexity associated with the discharge. The Recology Hay Road Landfill was

classified as a "1A" discharge under the previous WDR Order R5-2008-0188. These revised WDRs maintain the "1A" designation. The following fee criteria were used:

Threat to Water Quality:

Category "1" – "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."

Complexity:

Category "A" – "Any discharge of 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."

The WDR review cycle for 1A discharges is 5 years from the date of adoption of the WDRs, or, if granted a continuance by the Executive Officer, from the continuance date. The WDR fee schedule may be found on the State Water Resource Control Board website at: <http://www.waterboards.ca.gov/>.

202. Water Code Section 13267(b) provides that: "In conducting an investigation specified in subdivision (a), the Central Valley Water Board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Central Valley Water 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."
203. The technical reports required by this Order and the attached "Monitoring and Reporting Program R5-2016-0056" 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

204. 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.
205. The 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.
206. The Board, in a public meeting, heard and considered all comments pertaining to the

discharge.

207. 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 California 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 the 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 State Water Resource Control Board website at: <http://www.waterboards.ca.gov/>. or will be provided upon request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order R5-2008-0188 is rescinded, and that Recology Hay Road and Recology Hay Road, DBA Jepson Prairie Organics, their agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted there under, shall comply with the following:

A. PROHIBITIONS

Landfill Units

1. The discharge of "hazardous waste", as defined under Title 27, section 20164, to any classified unit at the site, is generally prohibited. The following exceptions apply to specific units:
 - a. Hazardous asbestos-containing wastes (ACW) may be discharged to LF-1 (DM-1A and DM-1B) to bring that portion of the unit up to final grade for closure and to any LF-3 or LF-4 module.
 - b. Wastes authorized under Title 22 to be managed as nonhazardous at a Class II landfill, and/or wastes granted a variance or reclassified under Title 22 regulations may be discharged to, or beneficially reused in, LF-3 and/or LF-4 (e.g., C-Soil, treated wood waste). The discharge or reuse of such wastes at Class III units (i.e., LF-1 and LF-2) is prohibited except that the existing stockpile of LC-soil at module DM-2.1 may remain in place until used as foundation cover at DM 2.1 or removed and reused at LF-3 or LF-4.
 - c. Wastes that have been treated or transformed in accordance with applicable regulations so as to be no longer hazardous. (e.g., medical wastes) may be discharged to LF-3 and/or LF-4.
2. The discharge of "designated waste", as defined under Title 27, section 20164, to any Class III landfill units (LF-1 and LF-2) at the site is prohibited, with the exception of LC-Soil previously approved by the Central Valley Water Board for use as foundation soil on LF-2.

3. The discharge of new or additional waste to LF-1 is prohibited, except for the following:
 - a. The discharge of hazardous ACW to LF-1 noted in Prohibition A.1.a.
 - b. The discharge of inert wastes (see Title 27, section 20230), nonhazardous C&D, or relocation of existing wastes within LF-1, as necessary, to establish final grades for closure consistent with an approved FC/PCMPs for those units submitted under this Order.
 - c. The stockpiling or beneficial reuse of inert materials in final cover construction or repair (e.g., foundation layer, side slope buttresses, berms) consistent with Discharge Specification B.7;
 - d. The beneficial reuse of inert liquids for final cover construction or maintenance purposes consistent with Discharge Specification B.7.c; and
 - e. The use of compost or dried sewage sludge as a soil amendment in final cover to promote vegetative growth, if applied at agronomic rates and there is no threat to water quality from storm water runoff.

All discharges to LF-1 above shall be terminated by **15 October 2021**. See Closure and Postclosure Specifications F.2.

4. The stockpiling of wastes or materials on landfill modules is generally prohibited, with the following exceptions
 - a. Inert wastes discharged to units for closure or postclosure maintenance purposes, as identified in Prohibition A.3 above;
 - b. The maintenance of temporary soil, C-Soil, or soil-waste admix operations stockpiles on Class II modules for landfill closure or construction purposes (e.g., operations layer, foundation layer for final cover, perimeter berms);
 - c. The stockpiling of approved materials on Class II units for interim cover/ADC operations (e.g., see Discharge Specification B.9);
 - d. Seasonal stockpiles of de-watered sludge on Class II modules for drying (e.g., dry season) or storage (e.g., wet season) purposes.
 - e. LC-soil re-classified as "nonhazardous" by the Department of Toxic Substances Control and as approved by Central Valley Water Board in 1993 and 1994 may be stockpiled on LF-2 and LF-3;
 - f. LF-3 stockpiles may be placed on top of the LF-3 interface liner where the location is vertically above LF-1 or LF-2.

All operations stockpiles on landfill modules shall be conducted consistent with the approved plan(s) applicable to those operations.

5. The discharge or co-disposal of bulk, non-containerized liquid wastes (including semi-solid wastes containing free liquids) can be accepted to LF-3 and LF-4, which

are underlain by a Title 27 composite base liner, except as described in Discharge Specification B.5. The use of liquid from Pond B for dust control is allowed: (a) on landfill units underlain by a Title 27 composite liner system, (b) only between 15 April and 15 October, and (c) only after Water Code Section 13301 Order R5-2014-0117-01 has been rescinded or revised to allow the use of Pond B liquid as dust control.

6. The following discharges of leachate and/or LFG condensate are prohibited:
 - a. The return of leachate and/or LFG condensate to an MSW landfill unit that does not have a composite liner system and LCRS (i.e., LF-1).
 - b. The discharge of leachate and/or LFG condensate from one MSW landfill unit to another, including from LF-1 to LFs-2, 3 or 4; from LF-2 to LFs-1, 3 or 4; from LF-3 to LFs-1, 2 or 4; and/or from LF-4 to LFs-1, 2 or 3. See Discharge Specification B.5.
 - c. The return or discharge of leachate and/or LFG condensate to closed units or closed portions of active units.
 - d. The return of leachate and/or LFG condensate to LF-2.

See 40 CFR 258.28(a)(2) and Title 27, sections 20705(f), 20090(e)(2), 20200(d), 20340(g), and 20190(a)(5).

7. Treated Wood Waste (TWW) may only be discharged to LF-3 and LF-4, and shall not be discharged to landfill modules that have a confirmed leachate leak that contains TWW constituents. Upon confirmation of a leachate leak or release from the landfill to the unsaturated zone and/or groundwater, or fluid in an unsaturated zone or a leak detection device containing one or more TWW constituents, all TWW discharges to that module shall be ceased until such time as corrective action measures result in cessation of the leak/release.
8. The Discharger shall comply with all Standard Prohibitions listed in Section C of the Landfill SPRRs.

Class II Waste Pile (WP 9.1A) & LTU

9. A Class II waste pile shall not be used for disposal of wastes.
10. Wastes containing free liquids, as determined by the paint filter test, shall not be discharged to a Class II waste pile.
11. The discharge of new or additional wastes, including, but not limited to, de-watered WWTP sludge, to the LTU is prohibited. Existing wastes and impacted soil in the LTU shall be removed and properly disposed of in accordance with the revised clean closure work plan for that unit, as approved.
12. No facility operations or construction stockpiles shall be maintained in the LTU area

prior to clean closure, except as necessary for conducting clean closure activities.

13. The Discharger shall comply with all Standard Prohibitions listed in Section C of the Industrial SPRRs.

Composting Facility

14. The discharge, processing, or storage of any of the following wastes at the composting facility is prohibited:
 - a. Hazardous or designated wastes, as classified under Title 27, section 20164;
 - b. TWW or wood containing lead-based paint or wood preservatives;
 - c. Ash from wood described in A.14.b above;
 - d. Free liquids other than compost leachate, runoff, and/or liquids in authorized feedstock;
 - e. Medical wastes as defined in the Health and Safety Code section 117690;
 - f. Radioactive wastes;
 - g. Septage, sewage sludge; and
 - h. Water treatment plant and/or industrial sludge.
15. The discharge of compost materials, including feedstock, additives, amendments, and/or finished product outside of the 22-acre compost pad is prohibited.
16. The discharge of compost facility leachate within MSW landfill units is prohibited except for use as dust control on Class II landfill units per Discharge Specification B.27, and only after Water Code Section 13301 Order R5-2014-0117-01 is rescinded or revised to allow the use of Pond B liquid as dust control. See Prohibition A.5.
17. The discharge of compost facility leachate to surface water, the unsaturated zone, and/or groundwater is prohibited.
18. The discharge of liquid from Pond A or Pond B to any surface drain or sedimentation basin (including the adjacent pond formerly referred to as the "green waste pond") is specifically prohibited.
19. Except for runoff captured in the facility's leachate collection system, the commingling of compost facility leachate with surface water or storm water is prohibited. The commingling of compost facility leachate or runoff with pumped groundwater is also prohibited.
20. Use of WWTP sludge, or anaerobic digestate derived from WWTP sludge, in composting operations is prohibited.
21. Evapo-concentration of constituents in any compost facility pond that results in

hazardous constituent concentration levels, as defined in California Code of Regulations, Title 22, section 66261.3 is prohibited.

General

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

B. DISCHARGE SPECIFICATIONS

Landfill Units

1. The Discharger shall only discharge the wastes listed in the table below.

WASTE ACCEPTANCE BY LANDFILL UNITS				
Title 27 Waste Type	LF-1	LF-2	LF-3⁴ and LF-4	Waste Pile 9.1A
MSW	No	Yes	Yes	No
Inert C&D (e.g., concrete, cured asphalt, brick)	Yes	Yes	Yes	No
Nonhazardous C&D, commercial, & industrial	Yes	Yes	Yes	No
Designated C&D, commercial, & industrial	No	No	Yes	No
Contaminated Soil (C-Soil)	No	Limited ¹	Yes	No
Leachate and LFG Condensate	No	No	Recirculation ²	No
Asbestos containing wastes	Yes	No	Yes	No
Treated Wood Waste	No	No	Yes	No
Semi-solids and industrial sludges	No	No	Yes	De-watered WWTP sludge only
Dredge debris	No	No	Yes	No
Special Wastes ³	No	No	Yes	No

1. LC-soil re-classified as "nonhazardous" by the Department of Toxic Substances Control and as approved by Central Valley Water Board in 1993 and 1994 may be used as foundation cover soil.
 2. Leachate and landfill gas condensate recirculation may occur in compositely lined modules following written approval by the Central Valley Water Board staff.
 3. Special wastes as defined by Title 27 (e.g. triple-rinse pesticide containers, tires, large dead animals, medical wastes. Incinerator ash, and agricultural wastes)
 4. LF-3 wastes may be placed on top of the LF-3 interface liner where the disposal location is vertically above LF-1 or LF-2
2. The discharge of "designated waste", as defined under Title 27, section 20164, shall be limited to Class II landfill units (i.e., LF-3 and LF-4).
 3. The discharge of Title 22 special wastes, including, but not limited to C-Soil, shall be limited to Class II landfill units (i.e., LF-3 and LF-4).
 4. The discharge of Title 22 hazardous wastes granted a variance; reclassified; or otherwise authorized to be disposed of at a Title 27-regulated landfill (e.g., C-Soil,

TWW) shall be limited to Class II landfill units equipped with a composite liner system and LCRS (i.e., LF-3 and LF-4) including on top of the LF-3 interface liner where the disposal location is vertically above LF-1 or LF-2. An exception is made for the LC-soil currently stockpiled on LF-2; that stockpile may remain but no additional LC-soil may be added.

5. The discharge of liquids to the landfill shall be limited to the following:
 - a. Landfill leachate and/or LFG condensate returned to, or used for dust control on, the active MSW landfill unit from it was generated, provided such MSW landfill unit was constructed with a composite liner system and LCRS.
 - b. The beneficial reuse of inert liquids for construction or maintenance purposes (e.g., dust control).
 - c. Small containers of household liquids consistent with 40 CFR 258.28.
 - d. The beneficial reuse of compost Pond B liquid for dust control on Class II landfill units constructed with a composite liner system and LCRS, and only after the Water Code Section 13301 Order R5-2014-0117-01 is rescinded or revised to allow the use of Pond B liquid as dust control.

See Prohibitions A.6. Leachate and LFG condensate derived from LF-1 and LF-2 shall therefore be discharged at an authorized offsite facility or appropriately handled for such discharge (e.g., stored in tanks pending pick-up) in accordance with the Landfill Liquids Management Plan required under Facility Specification C.2.c.

6. The co-disposal of semi-solid wastes with solid wastes shall be limited to de-watered WWTP sludge and/or water treatment plant sludge (i.e., sludge from which all free liquids have been removed) discharged to LF-3 and/or LF-4.
7. The beneficial reuse of wastes in final cover construction, repair or maintenance at unlined or partially-lined MSW landfill units (i.e., LF-1 and LF-2) per Prohibition A.3.c shall be subject to the following restrictions:
 - a. Inert wastes used in construction or repair of landfill final cover shall meet the project specifications contained in the approved construction documents described in, or submitted under, this Order and shall be applied consistent with the approved FC/PCMP for that unit submitted under this Order. See Construction Specifications E.9 and E.14.
 - b. Only clean soil (i.e., soil not containing any waste) may be used in the construction/repair of the landfill cover; the erosion resistant and low hydraulic conductivity layers of prescriptive cover; cover berms and drains; side slope benches; landfill buttresses, and detention basin walls.
 - c. Inert liquids (i.e., unimpacted groundwater, surface water, or storm water) may be applied to landfill cover for construction or maintenance purposes (e.g., dust control, limited irrigation of vegetative cover) consistent with Title 27, section

21090(a)(5)(B).

- d. LC-soil re-classified as “nonhazardous” by the Department of Toxic Substances Control and as approved by Central Valley Water Board in 1994 may be used as foundation cover soil on LF-2.
8. Consistent with Prohibition A.6.b, LFG extracted from an MSW landfill unit (e.g., LF-3) shall not, prior to removing LFG condensate, be comingled with LFG extracted from another MSW landfill unit (e.g., LF-4), if such condensate is to be returned to the former MSW landfill unit (e.g., LF-3).
 9. Consistent with Prohibition A.4.c, daily cover and ADC stockpile operations shall be limited to active MSW landfill units LFs-3 and 4, with the exception of the existing LC-soil stockpile on LF-2 consisting of LC-soil reclassified as “nonhazardous” by the Department of Toxic Substances Control and as approved by Central Valley Water Board in 1994. The use of ADC at these units shall be limited to the wastes/materials that have either been designated acceptable in Title 27 or wastes/material for which the Discharger has prepared a site-specific demonstration project and obtained approval consistent with Title 27, Section 20690. The following wastes/materials are currently approved for use as ADC based on information in the JTD and demonstrations under previous WDRs:
 - a. Dried sewage sludge/biosolids;
 - b. C-Soil
 - c. Dredge spoils, foundry sands, and/or contaminated sediment;
 - d. Green waste material, compost-overs, ground wood, and/or C&D fines;
 - e. Shredded tires;
 - f. Moisture-conditioned ash, cement kiln dust, and/or mixtures of these wastes; and/or,
 - g. Geosynthetic fabric, blankets, and/or foam products.The Discharger shall not use any new waste/material (i.e., item not included in the above list) as ADC, or any material other than clean soil as intermediate cover (except for biosolids as a cover soil amendment per Prohibition A.3.e), unless it has been designated acceptable in Title 27 or the Discharger has prepared a site-specific demonstration project demonstrating that the proposed alternative material meets the requirements in Title 27, section 20690 and the demonstration has been approved by the Local Enforcement Agency and Water Board staff.
 10. The Discharger shall use approved ADC only in internal areas of the landfill that do not drain outside of the limits of the contiguous landfill units, unless the Discharger demonstrates that runoff from the particular ADC is not a threat to surface water quality and the demonstration has been approved in writing. This demonstration may take removal of sediment or suspended solids into account for landfills where surface water drains to a sedimentation basin.

11. Storm water contacting non-inert wastes, including any stockpiled wastes on landfill modules or wastes used in interim cover/ADC operations, shall be handled and disposed of as leachate.
12. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order. If the Discharger is unable to remove and relocate the waste, the Discharger shall submit a report to the Central Valley Water Board explaining how the discharge occurred, why the waste cannot be removed, and any updates to the waste acceptance program necessary to prevent re-occurrence. If the waste is a hazardous waste, the Discharger shall immediately notify the Department of Toxic Substances Control.
13. The Discharger shall discharge treated wood wastes only to landfill modules equipped with a composite liner system and a leachate collection and removal system (i.e., Landfill Units LF-3 and LF-4 modules). If a verified release is detected from the waste management unit module where treated wood is disposed and the release has been confirmed to contain one or more TWW waste constituents, the disposal of treated wood shall be terminated at the module with the verified release until corrective action ceases the release.
14. The Discharger shall manage treated wood waste in accordance with California Health and Safety Code sections 25143.1.5 and 250150.7 and shall comply with all prohibitions listed in Title 22, section 67386.3.
15. Consistent with the engineered alternative design options specified in Construction Specification E.1.a, all future landfill expansion units/modules, with the exception of DM-7.2, shall be sited, designed, and constructed to ensure at least 5 feet of separation between the lowest elevation of wastes (i.e., leachate in primary LCERS sump) and the highest anticipated elevation of underlying groundwater in the absence of groundwater pumping. The approved EAD/S for DM-7.2 is 2.5 feet of separation between the lowest elevation of wastes (i.e., leachate in primary LCERS sump) and the highest anticipated elevation of underlying groundwater in the absence of groundwater pumping.
16. The Discharger shall comply with all Standard Discharge Specifications listed in Section D, and all Standard Storm Water Provisions listed in Section L, of the Landfill SPRRs.

Class II Waste Pile (WP 9.1A) & LTU

17. The discharge of wastes to a Class II waste pile shall be limited to designated, nonhazardous, and/or inert solid and/or semi-solid wastes.

18. Sewage sludge discharges to a Class II waste pile shall contain at least 20 percent solids (by weight) if primary sludge, or at least 15 percent solids if secondary sludge, or a mixture of primary and secondary sludges.
19. A minimum freeboard of 3 feet shall be maintained at a Class II waste pile between the highest elevation of wastes (including any ponded storm water) and the lowest elevation of the surrounding containment berm.
20. Storm water ponded on top of a Class II waste pile shall be removed within 24 hours and disposed of as leachate.
21. The LTU area shall be covered and graded during the wet season to minimize the potential for storm water runoff to come into contact with wastes or infiltrate into LTU wastes. All storm water runoff coming into contact with LTU wastes shall be handled and disposed of as leachate.
22. The Discharger shall comply with all Standard Discharge Specifications listed in Section D, and all Standard Storm Water Provisions listed in Section L, of the Industrial SPRRs.

Composting Facility

23. Materials used for compost feedstock shall be limited to green wastes, food wastes, manure, agricultural material, paper material, and vegetative and non-vegetative material as defined in the CGO.
24. The following additives shall comprise no more than 30 percent combined, on a total volume basis, of the total feedstocks for any given batch of compost:
 - a. Fertilizing material applied at rates that will be consumed or fixed/immobilized during active composting;
 - b. Liquid food material;
 - c. Anaerobic digestate (solid); and/or
 - d. Lime;
 - e. Crab shells; and/or
 - f. Any other additive(s) approved by the LEA and Water Board staff.
25. Compost facility ponds shall be:
 - a. Designed, constructed, operated, and maintained to prevent conditions contributing to, causing, or threatening to cause contamination, pollution, or nuisance;
 - b. Managed as described in the approved Compost Facility Leachate Collection/Pond System O&M Plan. Prior to submission and approval of this plan, the ponds shall be managed as described in Finding 149.

- c. Designed, constructed, operated and maintained to maintain a minimum freeboard of 0.9 feet in Pond A and 2.0 feet in Pond B. See Construction Specifications E.17.
 - d. Managed to maintain a dissolved oxygen concentration in the upper zone (one foot) of at least 1.0 milligrams per liter (mg/L) in each pond.
 - e. Managed to prevent conditions of pollution, nuisance or vectors (e.g., mosquitos).
26. All compost liquids handling facilities, including the leachate collection system, leachate sumps, pump systems, and leachate/wastewater ponds shall be operated and maintained in accordance with an operations and maintenance plan (Compost Facility Leachate Collection System/Pond O&M Plan) approved by Central Valley Water Board staff. The approved plan shall demonstrate that leachate, contact storm water, and other compost facility liquids are appropriately handled, stored, and disposed of to prevent an unauthorized discharge to surface water, groundwater, and/or the unsaturated zone at the site. The plan shall be submitted as specified in Provision I.12.c herein. Pending submission and approval of this finalized O&M plan, the Discharger shall implement the Interim Compost Pond O&M Plan described in Finding 149.

Within four weeks of adoption of this Order, the Discharger shall notify Central Valley Water Board staff by letter as to the current action level of the compost ponds. Thereafter, the Discharger shall, within 24-hours, notify Central Valley Water Board staff by telephone or email of a change in the compost pond operations action level under these plans, and within 7-days, submit a written report describing the reasons for the change; (e.g., liquid level, freeboard); relevant facility conditions; and response measures implemented/triggered under the plans, including any further action level changes implemented since the initial telephone/email notification (i.e., additional 7-day written reports not required for latter).

27. The use of compost facility leachate for dust control shall be limited to the area of the compost facility pad drained by Ponds A and B and to Class II landfill units with a composite liner system and LCRS under the following conditions:
- a. It is applied only between 15 April and 15 October each year.
 - b. It is applied only at rates necessary for dust control and shall not result in migration of leachate through landfilled waste.
 - c. It is applied using a water truck that is dedicated only for dust control on the Class II Landfill Units. Water trucks applying compost facility leachate may not be used for dust control outside of the lined Class II Landfill Unit unless they are properly cleaned prior to such use.
 - d. Compost leachate may only be applied to Class II landfill units after Water Code Section 13301 Order R5-2014-0117-01 is rescinded or revised to allow the use of Pond B liquid as dust control.

C. FACILITY SPECIFICATIONS

All Classified Units

1. All existing classified units at the site and DM-7.2, except for LF-1 and the LTU (i.e., LF-2, WP-9.1, and all LF-3 and LF-4 modules predating this Order) shall be operated consistent with the engineered alternative designs for groundwater separation (EAD/S) approved for these units/modules under previous WDRs, while all future classified units/modules at the site shall be operated consistent with Title 27 prescriptive standards (i.e., a minimum of 5 feet of separation between the lowest elevation of wastes and the highest anticipated elevation of underlying groundwater, including capillary fringe unless a capillary break is engineered into the liner system. A minimum of 5 feet of separation shall be maintained at LF-1 and the LTU. The required groundwater separation is listed for each landfill unit in the table below:

Unit	Modules	Required GW Separation (feet)
LF-1	DM-1A, 1B	5
LF-2	DM-2.1A, 2.1B	3
LF-3	DM-2.2A, B, 11.1, 11.2	2.5
	Future	5
LF-4	DMs-3.1, 3.2, 3.3, 4.1, 5.1A, 5.1B, 6, 7.1 and 7.2	2.5
	Future	5
WP-9.1	WP-9.1A, 9.1B	2.5
LTU-1	---	5

For the purposes of this specification, the following shall apply:

- a. The lowest elevation of wastes in lined units shall be the lowest elevation of leachate in the unit's primary LCRS sump and in unlined units shall be the lowest elevation of wastes.
- b. The highest anticipated elevation of underlying groundwater shall be the seasonally highest level that is expected to occur in the presence or absence of groundwater pumping, as applicable, including capillary fringe unless a capillary break is engineered into the liner system;
- c. The groundwater elevation beneath each module shall be monitored using dedicated piezometers installed outside the liner system and adjacent to the primary LCRS sump at a location that allows for measurement of the groundwater table. These WDRs include a schedule for submission of a work plan and installation of these devices; and

- d. The maximum groundwater elevation beneath each module of each classified unit at the site, including capillary fringe unless a capillary break is engineered into the liner system, shall not be allowed to exceed the value listed for that module in Table 1 attached to this Order, corresponding to the location of the lowest elevation of waste in the module under normal operations.
2. Per Title 27, section 21760(b), the Discharger shall develop and implement the following operations and maintenance (O&M) plans:
 - a. A LFG Controls O&M plan for the LFG extraction system to ensure that LFG is being sufficiently controlled at each landfill unit to prevent LFG migration from the unit that could impact or threaten water quality, and that extracted LFG is being handled appropriately in accordance with the requirements of this Order and Title 27 regulations. The plan shall include, but not be limited to, a plan for the installation of additional LFG extraction wells and/or capacity, as necessary, if LFG is not currently adequately controlled and the separate handling of LFG collected from a unit to which condensate from that LFG is being returned per Discharge Specification B.8. See Provision I.11.c.
 - b. An LCRS Sump O&M Plan to ensure that LCRS sumps are properly operated and that appropriate short term and long term response measures are timely implemented in response to foreseeable events such as a sump leak, the detection of fluid other than leachate in a sump, and/or a release from the unit under Title 27. The LCRS Sump O&M Plan shall include a description of the operation and maintenance procedures for all LCRS sumps at the site including landfill and waste pile modules. For each type of sump (e.g., primary, secondary/leak detection, welded pan lysimeter) at each unit, the plan shall describe the sump's design, purpose, operating parameters; monitoring facilities; action leak rate; short term and long term response plans in the event of a sump leak; notification of a release procedure; and the handling and disposition of any collected liquid (e.g., tanks, returned to landfill or primary LCRS). See Provision I.11.a.
 - c. Landfill Liquids Management Plan to ensure that liquids (leachate and LFG condensate) returned to a landfill unit does not include liquids derived from another unit in violation of Subtitle D liquids restrictions. The plan shall include, but not be limited to, a plan for the separate handling, removal of liquids destined to be returned to a landfill unit. See Provision I.11.b.
 3. By **30 September** of each year, the Discharger shall submit an **Annual Winterization Plan** describing measures planned to prepare the site for operations during the wet season consistent with the requirements of this Order. All classified units at the site (i.e., landfills, waste pile, LTU), including associated operations stockpiles, and the onsite composting facility (including ponds) shall be winterized in accordance with the Annual Winterization Plan. All repairs and winterization

measures implemented under the approved plan shall be completed by **31 October** of each year.

4. In the event of an interruption of greater than 24 hours of any corrective action measures, the Discharger shall notify the Board staff via e-mail, fax, or telephone within 24 hours of discovery of the interruption and shall provide weekly status updates until the corrective action measure are back on-line.
5. The Discharger shall comply with all Standard Facility Specifications listed in Section E, and all General Provisions listed in Section K, of both the Landfill SPRRs and Industrial SPRRs.

Composting Facility

6. Areas used for receiving, processing, or storing feedstocks, additives, amendments, or compost (active, curing, or final product) shall, at a minimum, be designed, constructed, and maintained to control and manage all run-on, runoff, and precipitation which falls onto or within the boundaries of these areas, from a 25-year, 24-hour peak storm event of 3.3 inches, as measured at DWR's CIMIS Weather Station Dixon 121.
7. All lined areas of the composting facility, including, but not limited to, active composting area; feedstock and finished compost storage areas; leachate collection system; and storage ponds shall be inspected, maintained, and repaired, as necessary to ensure adequate drainage and prevent infiltration.
8. The Discharger shall maintain all compost facility containment structures (e.g. berms, pads, detention ponds, tanks, run-on/run-off control structures, etc.) and monitoring systems in good working order.
9. The Discharger shall regularly inspect and maintain all containment structures and monitoring systems to prevent feedstocks, additives, amendments, compost (active, curing, or final product), or wastewater from creating, threatening to create, or contributing to conditions of contamination, pollution, or nuisance.
10. Composting operations shall be setback at least 100 feet from the nearest surface water body and/or the nearest water supply well.
11. All compost facility drainage ditches must be properly sloped to minimize ponding and kept free and clear of debris to allow for continuous flow of liquid. Ditches must be adequately protected from erosion, and must not cause, threaten to cause, or contribute to conditions resulting in contamination, pollution, or nuisance. Ditches must be inspected and cleaned out prior to the wet season every year.

D. CORRECTIVE ACTION SPECIFICATIONS

Landfill Units & Class II Waste Pile

1. For classified units at which the presence of LFG, LFG-impacted liquid, or LFG condensate-impacted liquid is (or has previously been) confirmed in an unsaturated zone or leak detection monitoring device (including a soil gas probe), the Discharger shall, in addition to any other necessary corrective action measures, make necessary adjustments/improvements to the LFG extraction system (e.g., increase extraction rate, upgrade extraction facilities) to remove LFG from the unsaturated zone at the unit. All such measures shall be implemented consistent with the approved LFG Controls O&M Plan submitted under Facility Specification C.2.a, and, in the case of a confirmed release, either the previously approved Corrective Action Plan for the unit submitted under the previous WDRs, or the work plan for implementation of measures in response to the non-leachate fluid.
2. For classified units in which the presence of contact-surface or storm water is (or has been previously) confirmed in an unsaturated zone or leak detection monitoring device, the Discharger shall, in addition to any other necessary corrective action measures, (a) investigate and make necessary repairs to the liner edge to prevent such future breach of the landfill's waste containment system, and (b) enhance the runoff and drainage controls for that portion of the landfill.
3. For the purpose of identifying the source of liquid detected in a leak detection monitoring device, the Discharger shall, for each classified unit so equipped, develop sample analysis profiles of all fluids that could potentially enter the leak detection monitoring device, including, for example, landfill leachate; impacted or unimpacted storm water, surface water, or groundwater; LFG; and LFG condensate. The sample analysis profiles shall be developed using both current and historical monitoring data. The sample analysis profiles shall include profiles of any liquid previously detected in a sump overlying the device in which the liquid to be identified has been detected. The results shall be provided in the updated Sample Collection and Analysis Plan submitted under Provision I.8, and annual updates thereto provided in the Annual Monitoring Report.
4. Liquids detected in a leak detection monitoring devices shall be investigated as follows:
 - a. Fluid Identification

If liquid is detected in a leak detection monitoring device, the Discharger shall follow the procedures set forth under MRP, section A.4.c.i. to confirm the identity of the liquid.

 1. If the liquid is confirmed to constitute measurably significant evidence of a leachate release, the Discharger shall implement the leachate release response described below, or another response as directed by Central Valley Water Board staff.

2. If the liquid is confirmed to constitute measurably significant evidence of a non-leachate fluid, the Discharger shall implement the non-leachate release response described below, or another response as directed by Central Valley Water Board staff.

b. Leachate Release Response

If the liquid is confirmed to constitute measurably significant evidence of a landfill leachate release, the discharger shall follow: (1) the procedures set forth in the "response to release" provisions contained in Title 27, Sections 20425 and 20430, Landfill SPRRs, Provision J.1, and Industrial SPRRs, Provision J.1, as applicable to the unit; and (2) those procedures set forth in the LCRS Sump O&M Plan relating to operating parameters and the handling, removal, and disposition of leachate, or (3) any of additional procedures directed by Central Valley Water Board Staff.

c. Non-Leachate Fluid Response

If the liquid is confirmed to constitute measurably significant evidence of a non-leachate fluid, the Discharger shall respond as follows or as otherwise directed by Central Valley Water Board staff:

i. Short Term Measures

Appropriate short term response measures may include, but not necessarily be limited to, those specified in MRP, section A.4.b (e.g., Central Valley Water Board notification, sampling, removal of fluid, monitoring of ongoing leak); feasible short-term measures under Corrective Action Specifications D.1 if relevant (e.g., increase gas extraction rate, check liner edge for infiltration, enhance the runoff and drainage controls); and other appropriate short term measures. Documentation of short term measures shall be provided in the semiannual monitoring report(s) for the relevant time period submitted under the MRP. Any short term measures continuing six months after the date of first detection of fluid in the leak detection monitoring device shall be proposed as long term measures.

- ii. Long Term Measures – Appropriate long term measures may include any short term measures continuing (or that need to be continued) more than six months from the date of discovery of the leak/fluid (e.g., removal of fluid,); investigation of the source of the leak/fluid; leak detection testing of liner; and repairs to the containment system. For leaks that exceed the sump's action leak rate (ALR), such repairs shall include all necessary measures to stop the leak or reduce the leakage rate to below the ALR,
- iii. O&M Plans – All short term and long term measures shall be consistent with the LCRS Sump O&M Plan and other relevant O&M plans based on the nature or type of leak or identified fluid (e.g., Landfill Liquids Management Plan, LFG Controls O&M Plan) and/or the previously approved Corrective Action Plan for the unit submitted under the previous WDRs.

- iv. Implementation Schedule – A work plan for the implementation of measures in response to the detection of non-leachate fluid in a leak detection monitoring device shall be submitted **within 30 days** of approval of the liquid identification profile report. If necessary, construction reports proposing or documenting repairs to the landfill's containment system to address the leak (or other cause of the detected fluid) shall be prepared and submitted consistent with Construction Specification E.9 and the Standard Construction Specifications listed in Section F of the Landfill SPRRs, as applicable. All response measures necessary to fix and prevent reoccurrence of the leak (or other cause of the detected fluid) shall be completed **within 18 months** of the date it was originally detected, or sooner if directed by Board staff.
5. For all units/modules in a corrective action program to address a release from the unit/module, the Discharger shall implement all corrective measures necessary to remediate the release and prevent a continued or subsequent release from the Unit, including, but not necessarily limited to, repairs, cleanup, and source control. Additional measures shall be implemented, as appropriate, if monitoring data indicates that cleanup is not being achieved in a reasonable timeframe and/or if waste constituent concentrations are increasing. To demonstrate cleanup of all water-bearing media affected by the release, the Discharger shall complete the applicable proof period under Title 27, section 20430(g) described in Monitoring Specification H.7 for each such media.

Class II Waste Pile & LTU

6. The Discharger shall complete clean closure of WP-9.1B and the LTU in accordance with the revised clean closure work plan, as documented in a certification report approved by Water Board staff. Prior to beginning construction of the DM-9.1 geosynthetics, the Discharger shall remove impacted vadose zone materials and show one year of decreasing groundwater trends in the footprint of the proposed disposal module.
7. By **15 October 2016**, the Discharger shall install a sidegradient detection monitoring well on the northern perimeter of the landfill boundary adjacent to WP-9.1 (i.e., WP-9.1A). See Provisions I.9.b and I.9.c and Attachment D: Groundwater Monitoring.
8. The Discharger shall comply with all Response to a Release specifications listed in Section J of the Industrial SPRRs.

E. CONSTRUCTION SPECIFICATIONS

Liner Systems

1. Future LF-3 and LF-4 modules shall, at a minimum, be constructed in accordance

with one of the following EAD/L options, from top to bottom:²¹

a. Base Liner

<u>Component</u>	<u>Option 1</u>	<u>Option 2</u>
Operations Layer	≥ 12 inches soil ¹	
Filter Fabric	Geotextile ²	
LCRS	6 inches gravel ^{1,3}	
Cushion Layer	Geotextile Cushion ⁴	
Primary Liner	60-mil HDPE Geomembrane ⁵	
	GCL and a minimum 30-mil geomembrane backing ^{6,8,9}	24-inch CCL ¹
	12-inch CCL ¹	
Foundation Layer	≥ 6-inches soil ^{1, 11}	
Secondary LCRS	Geocomposite ⁷	
Secondary Liner	60-mil HDPE Geomembrane ⁵	
	12-inch CCL ¹	---
Filter Fabric	Geotextile ²	Geotextile Cushion ⁴
Capillary Break ^{10, 11}	6-inches gravel ^{1,3} or geocomposite	
Subgrade	Re-compacted native soil or compacted soil fill ¹	

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.
2. Geotextile consists of non-woven fabric per project specifications.
3. $K > 1$ cm/sec per project specifications.
4. Cushion layer used only if the LCRS gravel is crushed, angular gravel, or greater than ½-inch in diameter. Cushion layer not required above the capillary break if a geocomposite or the secondary geomembrane is used as the capillary break. Cushion layer consists of non-woven fabric per project specifications.
5. Single or double-side textured (textured side down).
6. $K < 5 \times 10^9$ cm/sec per project specification.
7. Geocomposite consists of geonet bonded to geotextile filter layer on both sides.
8. GCL shall exhibit appropriate strength characteristics (hydrated) to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep, shear, and bearing capacity.
9. 30-mil geomembrane backing placed below the GCL and maybe part of the GCL or provided separate from the GCL.
10. Capillary break only required in the portions of the landfill where it necessary to provide 5 feet of separation between groundwater, including capillary rise, and the bottom of the liner.
11. Foundation layer thickness may be increased to 3 feet as a means to establish the required separation between groundwater and the bottom of the primary liner. In this case, the secondary geomembrane also acts as a capillary break.

²¹. Incorporates EAD approved under previous WDRs and Title 27 containment system requirements for side slope extensions overlapping an existing MSW landfill (i.e. LF-1) or Class III landfill (i.e. LF-2).

b. Sideslope Liner

	<u>Interface Areas</u> ¹		<u>Perimeter Levee</u>
	<u>LF-3/LF-1</u>	<u>LF-3/LF-2</u>	
Operations Layer	18 inches soil ²		
L CRS	Geocomposite ⁴		
Base Liner	60-mil HDPE Geomembrane ⁵		
	GCL and a minimum 30-mil HDPE geomembrane backing ⁶		
Secondary L CRS ⁷	Geonet (optional)		
Secondary Liner ⁷	60-mil HDPE Geomembrane (optional)		
Capillary Break	Geocomposite ⁴		
Subgrade	LF-1 cover soil ¹	LF-2 cover soil ²	Berm soil ²

1. Refers to areas where LF-3 sideslope liner overlaps LF-1 and LF-2 sideslope cover.
2. Liner component soils and gravels prepared/compacted in accordance with project specifications.
3. $K > 1$ cm/sec per project specifications.
4. Geocomposite consists of geonet bonded to geotextile filter layer on both sides.
5. Single side textured geomembrane used with textured side down.
6. $K < 5 \times 10^{-9}$ cm/sec per project specification. 30-mil geomembrane backing placed below the GCL and maybe part of the GCL or provided separate from the GCL.
7. Secondary L CRS and liner optional on sideslopes.

L CRS

2. The L CRS for LF-3 and LF-4 expansion modules shall, at a minimum, be constructed in accordance with the following, from top to bottom:
 - a. Blanket Drainage Layer –
 - 1) Minimum 6-inch thick layer of gravel over base liner
 - 2) Geocomposite (or equivalent combination of geonet and filter fabric) over side slopes, including LF-1 and LF-2 overlap areas.
 - b. Collection Piping
 - 1) Optional - Perforated 4-inch HDPE laterals installed in collection troughs (or directly on base liner) and plumbed to header pipe(s) along perimeter of module. Laterals shall be equipped with pipe risers at each end to allow for video camera inspection (by wire rope or robot) and cleaning, as necessary
 - 2) LFG collection pipes installed within the L CRS layer to allow for connection to LFG control system.
 - c. Grading – The base of each module/phase shall be graded with a 2 percent cross slope toward a central L CRS sump or header pipe plumbed to the L CRS sump. L CRS pipes shall be constructed with a minimum 1 percent slope.

3. LCRS sumps for LF-3 and LF-4 modules shall be constructed consistent with the following design, from top to bottom:

<u>Component</u>		<u>Specification</u>	
		Option 1	Option 2
Filter Fabric		Geotextile	
Primary Sump ^{3,4,8}	Gravel	Sump gravel ^{1,2}	
	Pump	Automatic with high and low alarms, flow meter	
Cushion		Geotextile	
Primary Composite Liner		60-mil HDPE Geomembrane ⁵	
		GCL and a minimum 30-mil HDPE geomembrane backing ⁶	24-inch CCL ⁶
Foundation Layer		≥ 6-inches soil ¹	
Secondary Sump ³		Geocomposite	
Secondary Composite Liner		60-mil HDPE Geomembrane ⁵	
		24-inch CCL ⁶	GCL and a minimum 30-mil geomembrane backing ⁷
Filter Fabric		Geotextile	
Capillary Break Layer		12-inches gravel ^{1,2}	

1. Liner component soils and gravels prepared/compacted in accordance with project specifications.
2. $K > 1$ cm/sec per project specifications.
3. Sump shall be equipped with an automatic pump, flow meter, and recording device, allowing instantaneous measurement of rate and volumes removed. High and low liquid level sensors and associated alarms shall also be included in design.
4. Design shall include appropriately-sized HDPE riser pipes for leachate monitoring and removal.
5. Single or double-side textured (textured side down).
6. $K < 1 \times 10^{-7}$ cm/sec per project specification.
7. 30-mil geomembrane backing placed below the GCL and maybe part of the GCL or provided separate from the GCL.
8. For sump depths of 12-inches or less, the maximum depth of leachate in the sump shall be 12-inches. For sump depths greater 12-inches, the maximum depth of leachate in the sump shall be the sump depth plus 3-inches.

4. A pan lysimeter consisting of a layer of geocomposite overlying 60-mil HDPE geomembrane shall be placed on the base of the capillary break layer directly beneath the secondary LCRS sump and plumbed to a perforated riser pipe. The thickness of the capillary break layer may be increased beneath the LCRS sump to accommodate the pan lysimeter and riser pipe, as necessary.

Final Cover

5. Final cover shall, at a minimum, be constructed in accordance with one of the following designs:

a. Title 27 Prescriptive Standard, from top to bottom:

<u>Component</u>	<u>Top Deck</u>	<u>Sideslopes</u> ¹
Erosion Resistant Layer	≥ 1 feet vegetative cover soil	
Geosynthetic Layer	60-mil HDPE Geomembrane or Equivalent ²	
Low Hydraulic Conductivity (LHC) Layer	≥ 1 foot compacted clay soil ³ ($k \leq 1 \times 10^{-6}$ cm/sec) ²	
Foundation Layer	≥ 2 feet soil or appropriate waste materials ⁴	

1. Includes exterior slopes and areas where LF-1 and LF-2 cover underlaps LF-3 sideslope liner...
2. Geosynthetic component not required over unlined units (i.e., DM-1A).
3. Minimum relative compaction of 90%.
4. Appropriate waste materials include materials approved for the use as foundation soil, such as C-soil, LC-soil, soil admixed with sludge.

b. One or more of the following Title 27 Engineered Alternative Designs (EADs), as applicable, from top to bottom:

1) GCL (All slopes)

<u>Component</u>	<u>Sideslopes</u>	
	<u>Exterior</u>	<u>Interfaces</u>
		<u>LF-3/LF-2</u> ¹
Erosion Resistant Layer	≥ 1 feet vegetative cover soil	
Geosynthetic Layer	60-mil HDPE Geomembrane	
Low Hydraulic Conductivity (LHC) Layer	Geosynthetic Clay Liner (GCL) ²	
Foundation Layer	≥ 2 feet soil or appropriate waste materials ³	

1. Refers to areas where LF-1 and LF-2 sideslope cover underlap LF-3 sideslope liner.
2. GCL shall exhibit appropriate strength characteristics (hydrated) to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep, shear, and bearing capacity.
3. Appropriate waste materials include materials approved for the use as foundation soil, such as C-soil, LC-soil, soil admixed with sludge.

2) ET Cover (Exterior slopes only)

<u>Component</u>	<u>Side Slopes</u>	
	<u>Exterior</u>	<u>Interfaces</u>
		<u>LF-3/LF-2</u>
Evapotranspirative Layer	≥ 3 feet soil	n/a ¹

1. ET cover not authorized in areas where LF-3 overlaps LF-1 and LF-2 (use prescriptive design or other approved EAD in these areas).
2. Minimum ET cover thickness shall be the greater of 3 feet and that required to meet Title 27 performance standards per the EAD demonstration per FC/PCMP.

3) Topdeck and Exterior Slopes:

<u>Component</u>	<u>Top Deck</u>	<u>Sideslopes</u>
Erosion Resistant Layer	< 1 foot vegetative cover soil	
Drainage Layer/Cushion	Min. 10oz/sy geotextile	Geocomposite ³
Geosynthetic Layer	60-mil HDPE Geomembrane ³	
Low Hydraulic Conductivity (LHC) Layer	GCL ¹	
Foundation Layer	≥ 1 foot soil or appropriate waste materials ²	

1. GCL shall exhibit appropriate strength characteristics (hydrated) to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep, shear, and bearing capacity.
2. Appropriate waste materials include materials approved for the use as foundation soil, such as C-soil, LC-soil, soil admixed with sludge.
3. The geocomposite and geomembrane may be replaced with a 60-mil HDPE structured geomembrane and overlying filter layer.

4) Liner-Cover Combination System (Sideslope Interface Areas Only)

For areas where LF-3 sideslope liner overlaps LF-1 or LF-2 sideslope cover, a combined liner-cover system that incorporates, but does not necessarily duplicate, elements specified above for LF-3 and LF-2 overlap liner (Construction Specification E.1) and LF-3 underlap final cover (Construction Specification E.5), provided that the combined containment system meets Title 27 performance standards for both final cover and Class III (non-composite) landfill liner.

The FC/PCMP or partial FC/PCMP submitted for each of the above landfill units shall include an appropriate EAD demonstration per Title 27, section 20080(b) for each of the above designs, as proposed.

7. The Discharger may propose changes to a containment system design (e.g., liner, cover, berm, compost pad or pond) prior to construction provided that approved components are not eliminated, the engineering properties of the components are not substantially reduced, and the proposed liner/final cover system results in the protection of water quality equal to or greater than the design prescribed by Title 27

and this Order. The proposed changes may be made following approval by the Executive Officer. Substantive changes to the design require reevaluation as an engineered alternative and approval by the Central Valley Water Board in revised WDRs.

8. The design and construction of all landfill module LCRS and containment system components shall incorporate adequate factors of safety to handle the increased vertical loads associated with vertical expansion.
9. **At least 90 days** prior to initiation of construction of any new landfill modules; containment system modifications or repairs to an existing classified unit or the compost facility; or closure/cover construction activities (e.g., per an FC/PCMP, Partial FC/PCMP), as approved by the Executive Officer, the Discharger shall submit for review and approval all applicable plans and reports, including, but not necessarily limited to, the following:
 - a. Any proposed design modifications pertaining to construction or closure of the unit, module, or phase per Construction Specification E.7.
 - b. A construction design report, including project specifications, drawings, grading and design plans; and
 - c. A Construction Quality Assurance (CQA) Plan which satisfies the requirements of Section 20324 of Title 27 as it applies to the construction of the erosion-resistant and foundation layers.

Module/closure construction shall proceed only after the above (and any other applicable) reports have been approved by Executive Officer.

10. LFG extraction facilities necessary to control LFG shall be installed within landfill waste as each new module is constructed and developed within 36 months of the first placement of wastes in each module or sooner as needed to control landfill gas. New modules shall be tied into the existing LFG extraction system in order to help control LFG.
11. Expansion of LF-3 or LF-4 may occur in an area where corrective actions are being performed provided the Central Valley Water Board has approved a plan for performing the corrective actions concurrent with a specific landfill expansion.
12. All interim landfill slopes shall be constructed in accordance with minimum safety factor of 1.5 or greater under static and dynamic conditions. Pursuant to Title 27, Section 21750(f)(5)(D), in lieu of achieving a factor of safety of 1.5 under dynamic conditions, the discharger may utilize a more rigorous analytical method that provides a quantified estimate of the magnitude of movement. In this case, the report shall demonstrate that this amount of movement can be accommodated without jeopardizing the integrity of the Unit's foundation or the structures which control leachate, surface drainage, erosion or gas.

13. All existing classified units and future expansion modules shall be constructed and maintained with exterior perimeter berms at least 28 feet NGVD29 in height for 100-year flood protection. Higher and/or wider berms may be required for slope stability. Future LF-3 and LF-4 modules that are constructed within the 100-year floodplain that have areas below 28 feet NGVD will be protected from 100-year flood with 28 feet NGVD 29 berms prior to the placement of waste within the module.
14. The Discharger shall comply with all Standard Construction Specifications listed in Section F of the Landfill SPRRs.

Compost Facility

15. Compost facility working surfaces must be capable of resisting damage from the movement of equipment and weight of piles. Working surfaces shall consist of one of the following:
 - a. Compacted soils, with a minimum thickness of one foot, and have a hydraulic conductivity of 1.0×10^{-5} cm/sec or less; or
 - b. Asphaltic concrete or Portland cement concrete; or
 - c. An equivalent engineered alternative approved by the Regional Water Board
16. Compost facility working surfaces and containment structures must be designed, constructed, operated and maintained to:
 - a. Facilitate drainage and minimize ponding by sloping or crowning pads to reduce infiltration of liquids;
 - b. Reliably transmit free liquid present during storage, treatment, and processing of materials to a containment structure to minimize the potential for waste constituents to enter groundwater or surface water; and
 - c. Prevent conditions that could contribute to, cause, or threaten to cause a condition of contamination, pollution, or nuisance.
17. All components of the compost facility leachate collection and storage system, including ditches, sumps, pumps, storage ponds and tanks shall, at a minimum, be designed, constructed, and maintained to handle leachate and runoff flows from a 25-year, 24-hour peak storm event. Pond A shall maintain a 0.9-foot freeboard and Pond B shall maintain a 2-foot minimum freeboard.
18. Leachate pond berms shall be designed, constructed, and maintained to prevent run-on and run-off from a 25-year, 24-hour peak storm event at a minimum. Berms must be adequately protected from erosion, and must not cause, threaten to cause, or contribute to conditions resulting in contamination, pollution, or nuisance.
19. Compost facility drainage ditches must be designed, constructed, and maintained to convey all precipitation and runoff from a 25-year, 24-hour peak storm event and be lined with one of the following:

- a. Compacted soils, with a minimum thickness of one foot and a hydraulic conductivity of 1.0×10^{-5} cm/sec or less; or
 - b. Asphaltic concrete or Portland cement concrete; or
 - c. An equivalent engineered alternative approved by the Regional Water Board.
20. The Discharger must submit a technical report with design information at least **90 days** prior to any new compost facility construction of any working surfaces, detention ponds, berms, ditches, or any other water quality protection containment structure for approval by the Regional Water Board. The design information must include water balance calculations for detention ponds, design of wastewater conveyance features, liner materials and thicknesses, and rationale for liner system design. The technical report must ensure testing and quality assurance of liner materials and compacted soils in accordance with commonly accepted engineering practices, American Society for Testing and Materials test methods, and/or other appropriate material standards. See Construction Specification E.9.
21. The Discharger must submit a post-construction report to the Regional Water Board **within 60 days** of completing all compost facility construction activities associated with all applicable containment and monitoring structures, as required for compliance with this Order, including the MRP. The post-construction report must contain as-built plans and specifications to document that containment and monitoring structures were properly constructed and tested.

F. CLOSURE AND POST-CLOSURE MAINTENANCE SPECIFICATIONS

Landfill Units

1. By **15 October 2019**, the Discharger shall submit a FC/PCMP for LF-1 consistent with the construction specifications (e.g., Construction Specification E.5) and other applicable requirements of this Order. The FC/PCMP shall include plans for closure, or phased closure, of all portions of the unit, including top deck and sideslopes of DM-1A and DM-1B. The FC/PCMP shall include a landfill final cover design (consistent with the construction specifications of these WDRs), description of closure activities, a schedule, closure and postclosure cost estimates, slope stability analysis, and all other information required under Title 27, section 21769(c). See Provision I.10.b;
2. By **15 October 2021**, the Discharger shall complete closure of existing MSW landfill unit LF-1 and within 30 days thereafter submit a certification that the landfill has been closed consistent with Standard Closure and Postclosure Specification G.23, Landfill SPRRs.

3. The operator shall to the extent feasible, based on site specific factors, implement partial and/or partial final closure activities as the site operation progresses, consistent with the closure of the entire site, in accordance with Title 27, section 21120(a).
4. Landfill final cover designs proposed in preliminary or final closure plans submitted under this Order shall be consistent with the prescriptive standard or engineered alternative design (EAD) options specified in Construction Specification E.5 Any proposal for an EAD final cover included in a FCP or Partial FCP shall be accompanied by the requisite demonstration under Title 27, section 20080(b) and (c), including, but not limited to, a demonstration that construction of the prescriptive standard is infeasible and that the proposed EAD meets or exceeds Title 27 performance standards for final cover. Such demonstration may require a field pilot project or test pad.
5. Any proposal for final cover included in a preliminary, final, or partial final closure plan for a landfill unit shall meet the requirements of Title 27 and Subtitle D, including the requirement that that the permeability of the LHC layer (or percolation rate through a proposed ET cover) be no greater than that of the base liner or underlying natural geologic materials (whichever is less). See Title 27, section 21090(a)(2) and 40 CFR 258.60(a)(1).
6. Closed or partially closed landfill unit side slopes shall be no steeper than 2.5H:1V, and closed top deck areas shall be sloped at three percent or greater. Interim slopes steeper than 2.5H:1V are permissible, provided they are supported by a slope stability analysis.
7. The Discharger shall install and maintain an active landfill gas extraction system appropriately sized to remove LFG from closed landfill units throughout the postclosure period. Landfill gas shall be extracted from closed landfill units until such time that the landfill gas is no longer a threat to water quality as documented by the Discharger and approved by the Executive Officer.
8. For closure designs including geomembrane and/or GCL, the Discharger shall seal the edges of the final cover by connecting its components to the base liner, as necessary and feasible.
9. The Discharger shall test the critical interfaces of the final cover in a laboratory to ensure minimum design shear strengths are achieved and include the results in the final documentation report.

10. The Discharger shall ensure that the vegetative/erosion resistant layer receives necessary seed, binder, and nutrients to establish the vegetation proposed in the final closure plan. The Discharger shall install necessary erosion and sediment controls during the period the vegetation is being established.
11. The completed final cover will be periodically tested for damage or defects by monitoring surface emissions pursuant to California Code of Regulations, title 17, section 95471(c) and Title 27, section 21090(a)(4)(A). Defects will be repaired and tested for adequacy based on the closure CQA Plan.
12. The Discharger shall comply with all Standard Closure and Post-Closure Specifications listed in Section G, and all closure-related Standard Construction Specifications listed in Section F, of the Landfill SPRRs.

WP-9.1 & LTU

13. Existing units/modules in the area of each phase (i.e., WP-9.1A, WP-9.1B, LTU, compost pond) shall be clean closed, as documented in a clean closure certification report approved by Central Valley Water Board staff. Prior to beginning construction of the DM-9 geosynthetics, the Discharger shall remove impacted vadose zone materials and show one year of decreasing groundwater trends in the footprint of the proposed disposal module. See also Corrective Action Specification D.6.
14. At least 90 days prior to cessation of operations at WP-9.1A, the Discharger shall submit a clean closure work plan for the unit. All clean closure plans for Class II waste piles shall be prepared in accordance with Title 27 CCR Section 21410.
15. No clean closure activities may be conducted at a unit in the absence of a clean closure work plan approved by Central Valley Water Board staff.
16. No clean closure excavation activities shall be conducted at a Class II waste pile or LTU during the wet season.
17. The Discharger shall comply with all Standard Closure and Postclosure Specifications listed in Section G, and all Standard Storm Water Provisions listed in Section L of the Industrial SPRRs.

Compost Facility

18. At least **90 days** prior to cessation of composting operations, the Discharger shall submit a Clean Closure Plan for the composting facility (including composting pad and Ponds A and B) to the Water Board for Water Board staff approval. No composting facility closure construction activities may be initiated at the site absent an approved Clean Closure Plan for the facility.
19. Clean closure of the composting facility shall meet the performance standards for cleanup set forth in Title 27, section 21090(f).

20. If construction of future landfill modules will impact the footprint of the existing compost facility, composting operations on those impacted portions shall be terminated and shall be clean-closed prior to initiating construction of landfill modules (i.e., portions of DM-9 and/or 10) in that area.

G. FINANCIAL ASSURANCE SPECIFICATIONS

1. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for closure and post-closure maintenance of the landfill units at the site in at least the amounts of the cost estimates in the most recently approved PC/PCMP(s) submitted under this Order or previous WDRs, as adjusted for inflation annually. As of 15 June 2015, these amounts were, in 2015 dollars, \$26,724,439 for closure and \$7,523,752 for postclosure maintenance. A report regarding financial assurances for closure and post-closure maintenance shall be submitted to the Central Valley Water Board by 1 June of each year. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.
2. The Discharger shall update the most recently approved PC/PCMP any time there is a change that will increase the amount of the closure and/or post-closure maintenance cost estimate. The updated PCPCMP shall be submitted to the Central Valley Water Board, the Local Enforcement Agency, and CalRecycle. The PC/PCMP shall meet the requirements of Title 27, section 21769(b), and include a lump sum estimate of the cost of carrying out all actions necessary to close each Unit, to prepare detailed design specifications, to develop the final closure and post-closure maintenance plan, and to carry out the first thirty years of post-closure maintenance. Reports regarding financial assurance required in G.1 above shall reflect the updated cost estimate.
3. The Discharger shall obtain and maintain assurances of financial responsibility with CalRecycle for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill in at least the amount of \$1,546,311 in 2015 dollars including the annual inflation-adjusted cost estimate.

A report regarding financial assurances for corrective action shall be submitted to the Central Valley Water Board by **1 June of each year**. This may be the same report that is submitted to CalRecycle for this purpose. If CalRecycle determines that either the amount of coverage or the mechanism is inadequate, then within 90 days of notification, the Discharger shall submit an acceptable mechanism to CalRecycle and the Central Valley Water Board for at least the amount of the approved cost estimate.

4. The Discharger shall comply with all Standard Financial Assurance Specifications listed in Section H of the Landfill SPRRs.

H. MONITORING SPECIFICATIONS

1. The Discharger shall comply with the detection and corrective action monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone in accordance with these WDRs and MRP R5-2016-0056.
2. The Discharger shall comply with the Water Quality Protection Standard specified in the Water Quality Protection Standard Report submitted under Provision I.7 of this Order, as approved.
3. The concentrations of the constituents of concern in waters passing the Point of Compliance (defined pursuant to Title 27, section 20164 as a vertical surface located at the hydraulically downgradient limit of the landfill unit that extends through the uppermost aquifer underlying the unit) shall not exceed the concentration limits established pursuant to MRP R5-2016-0056.
4. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in MRP R5-2016-0056 and the Landfill SPRRs.
5. Detection monitoring data analysis methods, including those used for analysis of background data, shall be in accordance with Title 27, Section 20415(e)(7) through (e)(10) and the MSW Landfill or Industrial SPRRs, as applicable.
6. In the event of a release, the data analysis methods shall also include trend analysis; an evaluation of the water chemistry; and preparation of contaminant contour plots to monitor the nature of the release and effectiveness of corrective action measures, as specified in the MRP.
7. As permitted by Title 27, Section 20430(f) and 40 CFR 258.58(e)(2), corrective action may be terminated when the Discharger demonstrates that the constituents of the release have been reduced to levels at or below their respective concentration limits throughout the entire zone affected by the release. The Discharger may make this demonstration by satisfying a "proof period." The "proof period" shall consist of at least eight sampling events for each monitoring point that are approximately evenly distributed over a minimum of a one-year period in which the concentration of the constituents of the release remain at or below their respective sampling limit. The term "monitoring point" shall mean either a point of compliance or an alternative monitoring location proposed by the Discharger and approved by Water Board staff that adequately monitors groundwater quality while still enabling sequenced landfill development. The Discharger may make this demonstration while corrective action measures are either continuing or have been suspended or modified as approved by Water Board staff.

8. The Discharger shall adequately monitor soil pore gas along the perimeter of each landfill unit for the presence of LFG in concentrations that may threaten water quality or otherwise warrant adjustments or improvements to the LFG extraction system, including the installation of additional gas extraction or monitoring wells.
9. Any proposal for concentration limits greater than background (CLGBs) shall be accompanied by the requisite demonstration under Section 20400(c) (i.e., that it is technologically or economically infeasible to achieve the background value for that constituent and that the constituent will not pose a substantial present or potential hazard to human health or the environment). Approval of CLGBs shall require approval of revised WDRs by the Central Valley Water Board.
10. The Discharger shall comply with all Standard Monitoring Specifications listed in Section I of both the Landfill SPRRs and Industrial SPRRs, as applicable to the unit.

I. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the facility, including the MRP R5-201X-0056, the Landfill SPRRs dated December 2015, and the Industrial SPRRs dated April 2016, which are part of this Order, and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 and Subtitle D that are not specifically referred to in this Order.
3. The Discharger shall comply with MRP R5 2016-0056, which is incorporated into and made part of this Order by reference.
4. The Discharger shall comply with the applicable portions of the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Subtitle D and/or Title 27, dated April 2016.
5. If there is any conflicting or contradictory language between the WDRs, the MRP, or the SPRRs, then language in the WDRs shall supersede either the MRP or the SPRRs, and language in the MRP shall supersede the SPRRs.
6. All reports required by this Order shall be submitted pursuant to Water Code section 13267, and shall be prepared by a California-registered Civil Engineer or Certified Engineering Geologist.
7. By **30 November 2016**, the Discharger shall submit a revised Water Quality Protection Standard (WQPS) Report describing the WQPS for each classified unit (i.e., LFs-1 to 4, WP-9.1A and LTU) and each water-bearing media under this Order (i.e., soil pore water, groundwater, and surface water). The revised WQPS report shall specify the Constituents of Concentration, Concentration Limits, Monitoring

Points, Points of Compliance, and Compliance Periods, consistent with the requirements of this Order and Title 27 regulations. The revised WQPS Report shall adequately demonstrate that the use of intrawell monitoring is consistent with Title 27, Section 20080(b) and (c), and if not consistent with Title 27, propose to change the detection groundwater monitoring to interwell comparisons using hydraulically upgradient wells as backgrounds. In addition, the WQPS shall evaluate whether monitoring wells are appropriately placed and screened, including in zone(s) with the highest hydraulic conductivity, to detect the earliest possible release from a unit to the uppermost aquifer.

8. By **30 November 2016**, the Discharger shall submit an updated Sample Collection and Analysis Plan containing proposed sampling and analysis methods and protocols for monitoring all units at the site consistent with the revised WQPS Report required under Provision I.7 above, the sample profiling requirements of Corrective Action Specification D.3, other requirements of these WDRs, and the 7 April 2016 Notice of Violation.

9. Pursuant to Section 13267 of the California Water Code, the Discharger shall submit the following technical reports relevant to corrective action/monitoring at the site:

	Report	Due Date
a.	A work plan for the installation of a sufficient number of soil gas probes along the perimeter of each landfill unit to monitor the effectiveness of the LFG extraction system per Monitoring Specification H.8.	30 August 2016
b.	A combination work plan for: 1) the installation of piezometers adjacent to each LCRS sump of each classified unit to measure the groundwater elevation per Facility Specification C.1.c; 2) the installation of a detection monitoring well sidegradient of WP-9.1A per Corrective Action Specification D.7.	30 August 2016
c.	An installation report demonstrating installation and operability for the soil gas probes installed under I.9.a above, and the piezometers and detection monitoring well installed under I.9.b above.	30 December 2016 or 90 days after approval of work plan in I.9.a. and b. above, weather permitting
d.	A work plan for the installation necessary modifications and/or improvements to the LFG extraction system associated with corrective action activities, under the approved LFG Controls O&M Plan. See Corrective Action Specification D.1.	15 May 2017
e.	An installation report documenting installation of necessary modifications and/or improvements to the LFG extraction system associated with corrective action, per the gas controls work plan submitted under I.9.d above.	15 March 2018 or 90 days after approval of work plan in I.9.d. above

10. Pursuant to Section 13267 of the California Water Code, the Discharger shall submit the following technical reports relevant to completing closure of Landfill 1 (LF-1):

	Report	Due Date
a.	Closure Status Report (e.g., interested agency permitting/approvals; project schedule; site preparation and construction progress).	Quarterly, beginning 15 November 2019 and until Certification Report submitted
b.	Final Closure and Postclosure Maintenance Plans (FC/PCMPs) per Closure and Postclosure Maintenance Specification F.1.	15 October 2019
c.	Closure construction plans per Construction Specification E.9.	At least 90 days prior to initiation of closure construction
d.	Letter certifying completion of closure per Closure and Post-closure Maintenance Specification F.2.	15 November 2021
e.	Certification Report documenting completion of landfill closure construction per Standard Closure and Postclosure Specification G.24, SPRR.	15 May 2022

11. Pursuant to Section 13267 of the California Water Code, the Discharger shall submit the following technical reports relevant to landfill operations at the site:

	Report	Due Date
a.	A Landfill LCRS Sump O&M Plan, including, but not limited to, short term and long term response plans in the event of a sump leak per Facility Specification C.2.b.	30 October 2016
b.	A Landfill Liquids Management Plan to ensure that leachate & LFG condensate returned to landfill units are appropriately handled per Facility Specification C.2.c.	15 October 2016
c.	A LFG Controls O&M Plan to ensure that LFG is being sufficiently controlled at each landfill unit and is being appropriately handled per Facility Specification C.2.a.	15 March 2017

12. Pursuant to Section 13267 of the California Water Code, the Discharger shall submit the following technical reports relevant to composting operations at the site:

	Report	Due Date
a.	A work plan and schedule for the installation of three compost pond monitoring wells screened in the uppermost saturated interval upgradient and downgradient of Pond B per MRP Section A.9.b.i.	30 July 2016
b.	A Monitoring Well Installation Report for the above compost pond wells.	15 October 2016 or 90 days after approval of work plan in I.12.a. above
c.	A Compost Facility Leachate Collection Pond System O&M Plan to ensure that all compost facility wastewater is appropriately handled to prevent an unauthorized discharge to surface water, groundwater or the unsaturated zone per Discharge Specification B.26.	15 January 2017

13. The Discharger shall comply with all General Provisions listed in Section K of the MSW Landfill SPRRs (landfill units only) and Section K of the Industrial SPRRs (WP-9.1, LTU units only).
14. The Central Valley Water Board has converted to a paperless office system. All project correspondence and reports required under this Order shall therefore be submitted electronically rather than in paper form, as follows:
- a. All project correspondence previously submitted in paper form (e.g., letters, short reports) shall be converted to Portable Document Format (PDF) and emailed to the Central Valley Water Board at: centralvalleysacramento@waterboards.ca.gov. To ensure that the submittal is routed to the appropriate staff as quickly as possible, the following information shall be included in the body of the email:

Attention:	Title 27 Compliance & Enforcement Unit
Discharger name:	Recology Hay Road Landfill, Inc. & Jepson Prairie Organics
Facility name:	Recology Hay Road Landfill
County:	Solano
CIWQS place ID:	244435

Unit staff and senior shall also be cc'd on the email.

- b. All technical reports and monitoring reports required under this Order shall be converted to PDF and uploaded via internet to the State Water Board's GeoTracker database at <http://geotracker.waterboards.ca.gov>, as specified in

California Code of Regulations, title 23, section 3892, subdivision (d) and section 3893. Project-associated analytical data shall be similarly uploaded to the GeoTracker database in an appropriate format specified under this Order under a site-specific global identification number. Information on the GeoTracker database is provided at:

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

Notification of the Geotracker upload shall be emailed to the Central Valley Water Board at: centralvalleysacramento@waterboards.ca.gov, as described [above](#).

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 24 June 2016.

ORIGINAL SIGNED BY

PAMELA C. CREEDON, Executive Officer

WMH

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2016-0056
FOR
RECOLOGY HAY ROAD
RECOLOGY HAY ROAD, DBA JEPSON PRAIRIE ORGANICS
RECOLOGY HAY ROAD LANDFILL
CLASS II, III LANDFILLS, CLASS II WASTE PILE,
CLASS II LAND TREATMENT UNIT, AND COMPOSTING FACILITY
CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE
MAINTENANCE, AND CORRECTIVE ACTION
SOLANO COUNTY

This monitoring and reporting program (MRP) is issued pursuant to California Water Code section 13267 and incorporates requirements for groundwater, surface water, and unsaturated zone monitoring and reporting; facility monitoring, maintenance, and reporting contained in California Code of Regulations, Title 27, section 20005, et seq. (hereafter Title 27); Waste Discharge Requirements (WDRs) Order R5-2016-0056; *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Subtitle D and/or Title 27*, dated December 2015 (MSW Landfill SPRRs); and *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Industrial Facilities Regulated by Title 27*, dated April 2016 (Industrial SPRRs). Compliance with this MRP is ordered by the WDRs and the Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Central Valley Water Board or the Executive Officer.

A. MONITORING

The Discharger shall monitor all classified units (i.e., landfill, waste pile, and land treatment units) and the compost ponds at the site in accordance with the detection and corrective action monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone. Monitoring shall also be in accordance with the Standard Monitoring Specifications in Section I of the SPRRs and the Monitoring Specifications in Section H of the WDRs. All monitoring shall be conducted in accordance with the most recently approved Sample Collection and Analysis Plan which includes quality assurance/quality control standards. The Discharger may use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

All compliance monitoring points established for detection and/or corrective action monitoring shall constitute the monitoring points for the Water Quality Protection Standard. All groundwater monitoring wells listed in Tables A.1.a.i and A.1.b.i, unsaturated zone monitoring devices, leachate, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern (COCs) listed in the corresponding tables and Appendix 1 of this MRP.

The Discharger may use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower

than the analytical methods specified in this Monitoring and Reporting Program, and are identified in the approved Sample Collection and Analysis Plan.

While this MRP assigns monitoring points to background, detection, and corrective action monitoring programs, it is acknowledged that these designations may change over time.

The monitoring program of this MRP includes:

<u>Section</u>	<u>Monitoring Program</u>	<u>Reference Map</u> ¹
A.1	Groundwater Monitoring	Attachment D
A.2	Unsaturated Zone Monitoring	Attachments E & F
A.3	Leachate Monitoring, Seep Monitoring, and LCRS Testing	Attachment E
A.4	Leak Detection Monitoring	
A.5	Surface Water Monitoring	Attachment G
A.6	Solid & Semi-Solid Waste Monitoring	n/a
A.7	Landfill Facility Monitoring	
A.8	Additional Corrective Action Monitoring (e.g., LFG Extraction, LFG Condensate, Nitrate-N Remediation)	Attachments D, F & I
A.9	Composting Pond Monitoring	Attachment H
A.10	Compost Facility Monitoring	n/a

1. See reference map for monitoring locations.

1. Groundwater Monitoring

The Discharger shall operate and maintain groundwater detection and corrective action monitoring systems that comply with the applicable provisions of Title 27, sections 20415 through 20430. These groundwater monitoring systems shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27.

Groundwater monitoring shall be conducted consistent with this MRP and the revised Water Quality Protection Standard (WQPS) Report. Detection monitoring for naturally occurring inorganic constituents at the site shall be conducted in the eastern site area using an interwell monitoring approach, and in the western site area using an intrawell monitoring approach if it is supported by the revised, approved, WQPS Report.

Background and downgradient wells for interwell detection monitoring shall be identified by tracing groundwater gradient (natural or pump) flow streamlines (i.e., flow lines perpendicular to the gradient contours) through each unit, as applicable.¹ This

1. Background wells shall be found by following the flow streams upgradient from the unit (or units, if contiguous). and down gradient wells shall be found by following the same flow streams down gradient from the unit(s). The monitoring system may be further refined by identifying the flow streams passing through the

MRP therefore distinguishes between units on the western half of the site (i.e., LFs-1, 2 & 3), where the groundwater gradient and flow direction are controlled by borrow pit de-watering, and units on the eastern half of the site (i.e., LF-4, WP-9.1 & LTU), where the natural groundwater gradient prevails.

Historical releases from the units at the site have generally been limited to landfill gas, nitrate-N in groundwater, and VOC-impacted pan lysimeter liquid. This MRP therefore places all units at the site in concurrent detection and corrective action monitoring. Also, units and/or modules that are contiguous with each other relative to the groundwater flow direction (e.g., LF-1; and LF-2 and LF-3) have generally been placed in contiguous monitoring in accordance with Title 27, section 20415(e)(3).

The Discharger shall revise the groundwater monitoring system (after review and approval by Central Valley Water Board staff) as needed each time a new landfill module is constructed or for corrective action monitoring.

- a. Landfills 1, 2, and 3
 - i. Monitoring Points
 - (1) Landfill 1

Table A.1.a.i(1)					
Intrawell Monitoring Points – LF-1					
<u>Unit</u>	<u>Program</u>	<u>Module</u>	<u>Well¹</u>	<u>Well Location</u>	
LF-1	Background	DM-1B	G-7	Upgradient	
			G-6		
	Detection & Corrective Action	DM-1A		P-1	Sidegradient
				4BR	
		DM-1B	G-8	Downgradient	
		DM-1A	MW-4		
		DMs-1A & 1B			G-9
					G-10
					G-10R ³
					G-10M

- 1. Monitoring data from all wells evaluated by intrawell method.
- 2. Location of well relative to flow streams passing through module,
- 3. Well sampled only if G-10M is dry.

- (2) Landfills 2 & 3

Table A.1.a.i(2)				
Intrawell Monitoring Points – LFs-2 & 3				
<u>Unit</u>	<u>Program</u>	<u>Module</u>	<u>Well¹</u>	<u>Well Location²</u>

sumps of each unit/module (e.g., the assumed location within a landfill module where a significant leachate release could occur).

Table A.1.a.i(2)				
Intrawell Monitoring Points – LFs-2 & 3				
Unit	Program	Module	Well ¹	Well Location ²
LF-2 & LF-3 ³	Background	DMs-2.1, 2.2 & 11	G-2	Upgradient
		DMs-2.1 & 2.2	4BR	
	Detection & Corrective Action	DM-11	G-1	Sidegradient
		DMs-2.1 & 2.2	G-12	
		DMs-2.1 & 11	G-13	
		DM-2.2	G-27	
		DMs-2.1, 2.2, 11.1 & 11.2	G-11	Downgradient
			G-11M	
	G-11R ⁴			

1. Monitoring data from all wells evaluated by intrawell method.
2. Location of well relative to flow streams passing through module.
3. Landfill units contiguously monitored per Title 27, section 20415(e)(3).
4. Well sampled only if G-11 or G-11M is dry.

The groundwater monitoring network shall also include all future or replacement wells installed under these WDRs to monitor existing and future modules/phases constructed per the landfill development plan (e.g., DMs-2.3, 10, & 11.3).

b. Landfill 4

i. Monitoring Points

(1) Landfill 4

Table A.1.b.i(1)				
Interwell Monitoring Points – LF-4				
Unit	Program	Modules ²	Well ¹	Well Location
LF-4	Background	DMs-3, 4 & 7.1	G-26	Upgradient
		5.1A	G-18	
		5.1B, 5.2 & 6	G-17	
	Detection & Corrective Action	DM-5.1A	D-7	Sidegradient
		DM-9.1B ³	G-17	
		DMs-5.2 & 6	G-18	
		Downgradient	DMs-5.1B, 6 & 9.1B ³	G-16
			DM-5.1A, 5.2	G-20
			DMs-4.1 & 9.1A ³	G-25
			DMs-3.1 & 9.1A ³	G-28
			DM-3.2	G-29
	DMs-3.3 & 7.1	G-30		

1. Monitoring data from all wells evaluated by interwell method.
2. Location of well relative to flow streams passing through module.
3. Future disposal modules/phases.

(2) WP-9.1 & LTU

Table A.1.b.i(2)				
Interwell Monitoring Points – WP-9.1 & LTU				
<u>Unit</u>	<u>Program</u>	<u>Module</u>	<u>Well</u>	<u>Well Location</u>
WP-9.1	Background	WPs-9.1A & B	G-4R	Upgradient
	Detection	WP-9.1A	G-19R ³	Downgradient
			G-38 ⁴	
	Corrective Action	WP-9.1B ²	G-21 ³	Downgradient
			G-22 ^{1,3}	
G-23 ³				
LTU ²	Background	LTU-1 ⁴	G-19R ³	Upgradient
	Corrective Action		G-26 ³	Downgradient

1. Groundwater extraction well.
2. Unit/module to be clean closed to make room for construction of DM-9.1.
3. Wells to be abandoned prior to construction of DM-9.1.
4. Well to be installed down gradient of WP-9.1A concurrent with clean closure of WP-9.1B and the LTU. See WDR Provision I.9.b.3. and I.9.c.

The groundwater monitoring network shall also include all future or replacement wells installed under these WDRs to monitor existing and future modules/phases constructed per the landfill development plan (e.g., DMs-7.2, 8, & 9).

c. Monitoring Schedule

Monitoring at each unit shall include field parameter testing and groundwater sampling. Groundwater samples shall be collected and analyzed in accordance with the following schedule using the applicable test methods for each constituent listed in Appendix 1 attached to this Order. It is noted that other Board Orders may require a different schedule for corrective action monitoring. The most recent monitoring schedule shall take precedence.

Table A.1.c Groundwater Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters</i>			
Groundwater Elevation ¹	Feet & 100ths, NADV 88.	Daily/Weekly/Quarterly ²	Semiannually
Groundwater Separation ⁵	Feet & 10ths		
Volume Extracted ³	gallons	Quarterly	Semiannually
Temperature	oF	Semiannually	Semiannually

Table A.1.c Groundwater Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
Specific Conductance	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Turbidity	NTU	Semiannually	Semiannually
<i>Monitoring Parameters</i>			
General Minerals			
Total Dissolved Solids ⁶	mg/L	Semiannually	Semiannually
Bicarbonate Alkalinity ⁶	mg/L	Semiannually	Semiannually
Chloride ⁶	mg/L	Semiannually	Semiannually
Nitrate-N	mg/L	Semiannually	Semiannually
Sulfate ⁶	mg/L	Semiannually	Semiannually
Calcium ⁶	mg/L	Annually	Annually
Carbonate ⁶	mg/L	Annually	Annually
Magnesium ⁶	mg/L	Annually	Annually
Potassium	mg/L	Annually	Annually
Sodium ⁶	mg/L	Annually	Annually
Nitrogen Compounds			
Ammonia-Nitrogen	mg/L	Annually	Annually
Total Kjeldahl Nitrogen	mg/L	Annually	Annually
Volatile Organic Compounds (VOCs)	ug/L	Semiannually	Semiannually
Dissolved Metals			
Arsenic	ug/L	Annually	Annually
Chromium (total)	ug/L	Annually	Annually
Iron	ug/L	Annually	Annually
Lead	ug/L	Annually	Annually
Manganese	ug/L	Annually	Annually
<i>Constituents of Concern</i> ⁴	---	Every 5 years	Every 5 years

1. Based on water depth measurements/readings at groundwater wells and piezometers.
2. Groundwater elevation monitoring of piezometers installed adjacent to each LCRS sump shall be monitored on a daily, weekly, or monthly basis, as detailed in A.1.c.i, unless the Executive Officer authorizes an alternative frequency. Groundwater elevation monitoring of groundwater wells shall be on a quarterly basis.
3. This parameter applies only to groundwater extraction well(s).
4. See Appendix 1 for COCs and analytical methods.
5. Measured as the distance between the bottom of the LCRS sump (as listed in Table 1 of the WDRs) or the bottom of the waste for unlined module DM-1B and the elevation of the underlying groundwater.
6. These parameters have been excluded from the detection monitoring in order to reduce the risk of false positive indications and to therefore increase the reliability of detecting a leachate release. They are included as supplemental parameters for water quality trend analysis.

Once per quarter, the Discharger shall measure the piezometric groundwater elevation in each well/piezometer, determine groundwater flow direction, and estimate groundwater flow rates in the uppermost aquifer and in any zones of

perched water and in any additional portions of the zone of saturation monitored. The results shall be reported semiannually, including the times of expected highest and lowest elevations of the water levels in the wells, pursuant to Title 27, section 20415(e)(15).

- i. Primary LCRS Sumps - Monitoring of the groundwater elevation, including capillary fringe, as applicable, shall be conducted at the piezometers installed outside the liner system and adjacent to the primary LCRS sump at locations that allow for measurement of the groundwater table. The piezometers associated with DMs-3.1, 3.2, 3.3, and 7.2 sumps, as well as the four piezometers associated with DM-1 (3 on the northeast side and one on the southeast side) shall be monitored daily during the wet season from October 15 to March 30 and weekly during the dry season from April 1 to October 14. Other piezometers installed adjacent to shall be monitored weekly during the wet season from October 15 to March 30 and monthly during the dry season from April 1 to October 14.

Reporting of this groundwater elevation and separation data of each unit shall include the highest and lowest recorded groundwater elevations (and corresponding groundwater separation data) during each quarter of the reporting period and, time periods in which the required separation was not maintained, including capillary fringe, as applicable.

Groundwater samples shall be collected at least semiannually in all wells, including any future wells added as part of the approved groundwater monitoring system. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the currently-approved Sample Collection and Analysis Plan. Samples collected for the COC monitoring specified in Appendix 1 shall be collected and analyzed in accordance with the methods listed in Table VI every five years. Five-year COCs were last monitored in **October 2015** and shall be monitored again in **October 2020**. The results shall be reported in the Annual Monitoring Report for the year in which the samples were collected.

Background, detection, and corrective action monitoring data analysis shall be conducted consistent with the statistical and non-statistical data analysis methods described in Section C.1.e, as updated in the WQPS Report submitted under WDR Provision I.7, as approved by the Executive Officer.

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection and corrective action monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. Unsaturated zone monitoring at the facility shall include both soil pore liquid monitoring and soil pore gas monitoring. Soil pore liquid and gas monitoring shall be accomplished by monitoring pan lysimeters installed in the capillary break layer beneath the LCRS sumps of Title 27 classified units at the site (i.e., landfills and waste pile). Soil pore gas monitoring shall be further accomplished

by monitoring gas monitoring probes installed along or near the perimeter of the classified units at the site.² The Discharger shall install unsaturated zone monitoring devices (after review and approval by Central Valley Water Board staff) each time the landfill constructs a new cell or module.

Unsaturated zone samples shall be collected from the monitoring networks listed below and analyzed for the parameters and constituents listed in the monitoring schedules listed below in accordance with the specified methods and frequencies. Samples collected for the 5-year COC analyses specified above shall be collected and analyzed in accordance with the methods listed in Appendix 1 every five years, beginning again in **2020**.

a. Soil Pore Liquid Monitoring

i. Monitoring Points (See Attachment E: Leachate & Lysimeter Monitoring)

The soil pore liquid monitoring points shall consist of all pan lysimeters substantially meeting the specifications of WDR Construction Specification E.5 (as noted above) installed beneath existing and future landfill modules and the Class II waste pile as summarized in the tables below.

(1) LF-3

<u>Unit</u>	<u>Module</u>		<u>Program</u>	<u>Lysimeter</u>	
	<u>Name</u>	<u>Phase</u>	<u>Status</u>		
LF-3	DM-2	2.2A	Existing	Corrective Action	PL-2.2A ¹
		2.2B			PL-2.2B ¹
		2.3	Future	Detection	PL-2.3 ²
	DM-10	10.1	Future	Detection	PL-10.1 ²
		10.2			PL-10.2 ²
	DM-11	11.1	Existing	Corrective Action	PL-11.1 ¹
		11.2			PL-11.2 ¹
		11.3	Future	Detection	PL-11.3 ²

1. All pan lysimeters installed within, and open to, capillary break layer (not welded pans).
 2. Future modules required to be constructed with pan lysimeter.

2. Soil pore liquid monitoring shall not be required at existing landfill modules not constructed (and that cannot feasibly be retrofitted) with a pan lysimeter meeting the requirements of WDR Construction Specification E.5 (e.g., beneath LCRS sump, open to unsaturated zone). Such areas of the facility include all of LF-1 (no lysimeters installed beneath this unit) and LF-2 (suction lysimeter installed beneath this unit) and all LF-4 modules constructed with pan lysimeters welded to the base of the secondary LCRS sumps.

(2) LF-4

Table A.2.a.i(2) Soil Pore Liquid Monitoring Points: LF-4					
<u>Unit</u>	<u>Module</u>			<u>Program</u>	<u>Lysimeter</u> ¹
	<u>Name</u>	<u>Phase</u>	<u>Status</u>		
LF-4	DM-3	3.1	Existing	Detection & Corrective Action	--- ^{1,2}
		3.2			--- ^{1,2}
		3.3			--- ^{1,2}
	DM-4	4.1	Existing	Detection & Corrective Action	--- ^{1,2}
		4.2			--- ³
		4.3			--- ³
	DM-5	5.1A	Existing	Detection & Corrective Action	PL-5.1A
		5.1B			PL-5.1B
		5.2			--- ²
	DM-6	6.1	Existing	Detection	--- ^{1,2}
		6.2			--- ³
	DM-7	7.1	Existing	Detection	--- ⁴
		7.2	Future		PL-7.2 ⁵
	DM-8	8.1	Future	Detection	PL-8.1 ⁵
		8.2			PL-8.2 ⁵
DM-9	9.1	Future	Detection	PL-9.1 ⁵	
	9.2			PL-9.2 ⁵	

1. Soil pore liquid monitoring not required on modules with welded pan lysimeters.
2. Welded pan lysimeters monitored as leak detection sumps. See Section A.4.
3. Module phase not constructed with its own LCRS sump (i.e., LCRS drains to another phase).
4. No pan lysimeter installed because this sump location is temporary..
5. Future modules required to be constructed with pan lysimeter.

(3) Waste Pile 9.1

Table A.2.a.i(3) Soil Pore Liquid Monitoring Points: WP-9.1				
<u>Unit</u>	<u>Module</u>			<u>Lysimeter</u>
	<u>Name</u>	<u>Status</u>	<u>Program</u>	
WP-9.1 ^{1,3}	9.1A	Existing	Corrective Action	PL-9.1A
	9.1B ²	Clean Closure Pending		PL-9.1B

1. Unit will be limited to single module (9.1A) after clean closure of Module 9.1B (estimated to occur in 2016).
2. Module WP-9.1B pending clean closure along with LTU.
3. Discharger plans to clean close this unit by 2020 to accommodate construction of DM-9. See WDR Closure and Postclosure Specification F.17.

ii. Monitoring Schedule

Pan lysimeters shall be inspected for the presence of liquid **monthly**. Lysimeters need only be sampled when liquid is present. Any liquid confirmed to be present in a leak detection monitoring device per Section A.2.a.iii below (i.e., a release), including ongoing or intermittent (e.g., seasonal) detections, shall be sampled at least **semiannually** for the field and monitoring parameters listed in Table A.2.a.ii below. (More frequent monitoring may be required under an approved Evaluation Monitoring Program or Corrective Action Program). Thereafter, upon written approval by Board staff, pan lysimeter sampling and analysis at the module may revert to an annual schedule using the applicable test methods for each constituent listed in Appendix 1 attached to this Order.

Table A.2.a.ii Soil Pore Liquid Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters</i>			
Presence of liquid	---	Monthly	Semiannually
Volume of liquid removed and disposal location	Gallons, location	Monthly	Semiannually
Specific Conductance	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
<i>Monitoring Parameters</i>			
General Minerals			
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Bicarbonate Alkalinity	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Nitrate-N	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Calcium	mg/L	Semiannually/Annually ¹	
Carbonate	mg/L	Semiannually/Annually ¹	
Magnesium	mg/L	Semiannually/Annually ¹	
Potassium	mg/L	Semiannually/Annually ¹	
Sodium	mg/L	Semiannually/Annually ¹	
VOCs ¹	ug/L	Semiannually	Semiannually
Dissolved Metals			
Arsenic	ug/L	Semiannually	Semiannually ¹
Chromium (total)	ug/L	Semiannually	Semiannually ¹
Iron	ug/L	Semiannually	Semiannually ¹
Lead	ug/L	Semiannually	Semiannually ¹
Manganese	ug/L	Semiannually	Semiannually ¹

Table A.2.a.ii Soil Pore Liquid Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Constituents of Concern</i> ¹	---	Every 5 years ¹	

1. Pan Lysimeter liquid shall be sampled at least semiannually for all field parameters and monitoring parameters until such time as the liquid has been identified and Board staff approves a reduction to annual monitoring.
2. See Appendix 1 below.

iii. Confirmation of a Release

If liquid is detected at a lysimeter in detection monitoring (e.g., a historically dry lysimeter), the Discharger shall verbally notify Central Valley Water Board staff within seven days and immediately sample and test the liquid for the Field and Monitoring Parameters listed in Table A.2.a.ii above. In the event that a release is tentatively indicated, the Discharger shall proceed with confirmation sampling under the Landfill (Standard Monitoring Specifications G.46 and G.47) and Industrial (Standard Monitoring Specifications G.44 and G.45) SPRRs, as applicable to a given unit (i.e., landfill or waste pile). The Discharger shall also consider whether the detection of the liquid in the lysimeter constitutes significant physical evidence of a release under the Landfill (Standard Monitoring Specification G.48) and Industrial (Standard Monitoring Specification G.46, respectively). See also Title 27, Section 20385(a)(3).

Upon confirmation of a release to the unsaturated zone, the Discharger shall identify the type of soil pore liquid detected in the pan lysimeter using the procedures and sample analysis profiles provided in the updated Sample Collection and Analysis Plan and follow the Response to Release requirements of the WDRs and SPRR . The confirmation of leachate in a pan lysimeter may also trigger the need to de-water the module per WDR Facility Specification C.1.

b. Soil Pore Gas Monitoring

i. Monitoring Points (See Attachment F: Gas Controls & Monitoring)

The soil pore gas monitoring system for the landfill units shall include all existing and future gas monitoring probes installed in the unsaturated zone along the landfill facility and unit perimeters, and all pan lysimeters installed within the capillary break layer underneath the landfill units, as follows:

Table A.2.b.i Soil Pore Gas Monitoring Points				
<u>Unit(s)</u>	<u>Monitoring Point</u>	<u>Type</u>	<u>Program</u>	<u>Completion</u>
LF-1	GPs-1, 9, 12 & 21S	Facility	Detection	Shallow

Table A.2.b.i				
Soil Pore Gas Monitoring Points				
<u>Unit(s)</u>	<u>Monitoring Point</u>	<u>Type</u>	<u>Program</u>	<u>Completion</u>
	GP-21D	Probe		Deep
	GPs-2 & 7 ¹	Unit Probe	Corrective Action	Shallow
	--- ¹			Deep
LF-2 & LF-3	GPs-6,10,11, 18, 19, & 20S	Facility Probe	Detection	Shallow
	20D			Deep
	GPs-3A, 4A & 5 ¹	Unit Probe	Corrective Action	Shallow
	GPs-3B, 4B & 5B ¹			Deep
	PLs-2.2A, 2.2B, 11.1 & 11.2	Lysimeter	Detection	Capillary Break
	PLs-2.3, 10.1, 10.2 & 11.1 ²			
LF-4	GP-14,15,16,17	Facility Probe	Detection	Shallow
	--- ¹			Deep
	--- ¹	Unit Probe	Corrective Action	Shallow
	--- ¹			Deep
	PLs-5.1A&B	Lysimeter		Capillary Break
	PLs-7.2, 8.1, 8.2, 9.1 & 9.2 ²	Lysimeter	Detection	Capillary Break

1. Monitoring shall include any future gas wells installed along the facility or unit perimeter. See WDR Provision H.10.
2. Future lysimeters to be installed per the landfill development plan.

ii. Monitoring Schedule

Soil-pore gas samples shall be collected from the monitoring network listed above and analyzed in accordance with the following schedule.

Table A.2.b.ii Soil Pore Gas Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters</i> ¹			
Methane	%	Semiannually	Semiannually
Carbon Dioxide	%	Semiannually	Semiannually
Oxygen	%	Semiannually	Semiannually
Organic Vapors ²	ppm	Semiannually	Semiannually
<i>Monitoring Parameters</i>			
VOCs ^{3,4}	µg/cm ³	If detected	If detected

1. Field gas monitoring shall be conducted using appropriate field meter(s).
2. Total organic vapors shall be measured using a photoionization detector (PID) meter calibrated to a hexane standard or other straight-chain, fuel-related hydrocarbon. Conversion to benzene-equivalents shall be conducted using a response factor for benzene provided by the manufacturer.
3. Consistent with the previous WDRs, this Monitoring and Reporting program requires that the Discharger conduct field monitoring for methane and total organic vapors and sample for VOCs if vapors exceed a given trigger level of >1% methane and/or >1 ppmv total organic vapors.
4. VOC analysis shall be conducted using USEPA Method TO-15.

c. Confirmation of a Release

Confirmation of a gas release (i.e., LFG) to the unsaturated zone shall be conducted consistent with the procedures applicable to a gas leak described in Section 4.c.ii, herein, and, upon Central Valley Water Board staff approval of the report of findings submitted thereunder, constitute physically significant evidence of a release under the Landfill and Industrial SPRRs, as applicable. Upon confirmation of a gas release, the Discharger shall implement appropriate short term and long term corrective action measures consistent with the Correction Action Specifications and the Response to Release requirements of the applicable SPRRs.

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

The Discharger shall operate, maintain, and monitor all primary LCRS sumps and leachate monitoring wells installed at the units at the site. Leachate monitoring shall be conducted to quantify the amount of leachate being generated by the unit, characterize the strength of the leachate, and to identify/update landfill concentration of constituents of concern. In addition, the Discharger shall monitor each unit/module for leachate seeps, and conduct annual testing of each module's LCRS(s) in accordance with Title 27 and this monitoring program.

a. Monitoring Points (See Attachment E: Leachate & Lysimeter Monitoring

i. Landfill 1

Leachate monitoring at LF-1 shall be conducted at the following existing monitoring points:

Table A.3.a.i LF-1 Leachate Monitoring Points					
<u>Module</u>		<u>Program</u>		<u>Monitoring Points</u>	
<u>Unit</u>	<u>Name</u>	<u>Status</u>		<u>Primary LCRS Sump</u>	<u>Leachate Well</u>
LF-1	DM-1A	Existing	Corrective Action	---	LWs-1, 2 & 3
	DM-1B	Existing		LS-1	---

1. Module not constructed with LCRS sump.
2. No leachate monitoring wells in module.

ii. Landfills 2 & 3

Leachate monitoring at LFs 2 & 3 shall be conducted at the following existing and future monitoring points:

Table A.3.a.ii LFs-2 & 3 Leachate Monitoring Points					
<u>Unit</u>	<u>Module</u>			<u>Program</u>	<u>Monitoring Points</u>
	<u>Name</u>	<u>Phase</u>	<u>Status</u>		<u>Primary LCRS Sump</u>
LF-2	DM-2.1	---	Existing	Corrective Action	S-2.1
LF-3	DM-2	2.2A	Existing	Corrective Action	S-2.2A
		2.2B			S-2.2B
		2.3	Future	Detection	S-2.3
	DM-10	10.1	Future	Detection	S-10.1
		10.2			S-10.2
	DM-11	11.1	Existing	Corrective Action	S-11.1
		11.2			S-11.2
11.3		Future	Detection	S-11.3	

iii. Landfill 4

Leachate monitoring at LF-4 shall be conducted at the following existing and future monitoring points:

Table A.3.a.iii LF-4 Leachate Monitoring Points					
<u>Unit</u>	<u>Module</u>			<u>Program</u>	<u>Monitoring Points</u>
	<u>Name</u>	<u>Phase</u>	<u>Status</u>		<u>Primary LCRS Sump</u>
LF-4	DM-3	3.1	Existing	Detection & Corrective Action	S-3.1
		3.2	Existing		S-3.2
		3.3	Existing		S-3.3
	DM-4 ²	4.1	Existing	Detection & Corrective Action	S-4.1 ¹
		4.2	Existing		
		4.3	Existing		
	DM-5	5.1A	Existing	Detection & Corrective Action	S-5.1A
		5.1B	Existing		S-5.1B
		5.2	Existing		S-5.2
	DM-6	6.1	Existing	Detection	S-6.1 ¹
		6.2	Existing		
	DM-7	7.1	Existing	Detection	S-Temp ²
		7.2	Future		S-7.2 ¹
	DM-8	8.1	Future	Detection	S-8.1
		8.2	Future		S-8.2
DM-9	9.1	Future	Detection	S-9.1	
	9.2	Future		S-9.2	

1. Module constructed (or will be constructed) only one primary LCRS sump.
2. Module constructed with temporary LCRS sump pending construction of second phase of module

iv. Waste Pile 9.1

Leachate monitoring at WP-9.1 shall be conducted at the following existing monitoring points:

Table A.3.a.iv WP 9.1 Leachate Monitoring Points					
<u>Unit</u>	<u>Module</u>			<u>Program</u>	<u>Monitoring Points</u>
	<u>Name</u>	<u>Phase</u>	<u>Status</u>		<u>Primary LCRS Sump</u>
WP-9.1 ^{1,3}	WP-9.1A	---	Existing	Corrective Action	LS-9.1A
	WP-9.1B	---	Existing ²		LS-9.1B

1. Unit will consist of single module (WP-9.1A) after clean closure of WP-9.1B.
2. Module WP-9.1B pending clean closure along with LTU.
3. Unit will ultimately be clean closed to make room for DM-9. See WDR Finding 210.

b. Leachate Monitoring Schedule

Leachate monitoring shall be conducted in accordance with the following schedule. (See Appendix 1 attached to this Order for applicable test methods.)

Table A.3.b Leachate Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters</i>			
Depth of liquid	feet and tenths, NADV88	Monthly	Semiannually
Flow Rate	gallons/day	Monthly	Semiannually
Volume Pumped			
To Storage Tanks	gallons	Monthly	Semiannually
Recirculated, location	Gallons, location	Monthly	Semiannually
Disposal, location	Gallons, location	Monthly	Semiannually
Electrical Conductivity	umhos/cm	Quarterly	Semiannually
pH	pH units	Quarterly	Semiannually
<i>Monitoring Parameters</i>			
General Minerals			
Total Dissolved Solids	mg/L	Annually	Annually
Bicarbonate Alkalinity	mg/L	Annually	Annually
Chloride	mg/L	Annually	Annually
Nitrate-N	mg/L	Annually	Annually
Sulfate	mg/L	Annually	Annually

Table A.3.b Leachate Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
Calcium	mg/L	Annually	Annually
Carbonate	mg/L	Annually	Annually
Magnesium	mg/L	Annually	Annually
Potassium	mg/L	Annually	Annually
Sodium	mg/L	Annually	Annually
Nitrogen Compounds			
Ammonia-Nitrogen	mg/L	Annually	Annually
Total Kjeldahl Nitrogen	mg/L	Annually	Annually
VOCs	ug/L	Annually	Annually
Dissolved Metals			
Arsenic	ug/L	Annually	Annually
Chromium (total)	ug/L	Annually	Annually
Copper	ug/L	Annually	Annually
Iron	ug/L	Annually	Annually
Lead	ug/L	Semiannually	Annually
Manganese	ug/L	Semiannually	Annually
Pentachlorophenol (PCP)	ug/L	Annually	Annually
<i>Constituents of Concern⁴</i>	---	Every 5 years	Every 5 years

1. LCRS sump freeboard shall be measured from the lowest elevation of the top of the surface impoundment down to the water level in the impoundment and can be measured using markings on the primary geomembrane liner or a free-standing gauge.
 2. Monitoring for this parameter shall also be conducted within 24 hours of storm event producing more than two inches of rainfall in a 24 hour period.
 3. See Appendix 1 below.
- c. Seep Monitoring -- The Discharger shall monitor all areas of the units (e.g., top deck, side slopes, toe areas, and levee corridor) for leachate seeps, including as part of Facility Monitoring under Section A.7. Any observed leachate seepage from the landfill unit shall be sampled upon detection and analyzed in accordance with Table A.3.b above using the applicable test methods for each constituent listed in Appendix 1 attached to this Order. Reporting for leachate seeps shall be conducted as required in Section B.4 of this MRP. The quantity of leachate shall be estimated and reported as Leachate Flow Rate (in gallons/day).
- d. Annual LCRS Testing -- All LCRSs shall be tested annually pursuant to Title 27, section 20340(d) to demonstrate proper operation (except if existing LCRS is not equipped with test port). The results of these tests shall be reported to the Central Valley Water Board in the Annual Monitoring Report and shall include

comparisons with earlier tests made under comparable conditions.

- e. Storage Tanks – The Discharger shall also monitor, and include in the semiannual monitoring reports, the total volume of leachate (including any commingled LFG condensate) pumped from onsite storage and hauled offsite for disposal each month. Disposal location information shall also be provided in the monitoring reports.

4. Leak Detection Monitoring

The Discharger shall conduct leak detection monitoring to detect a leak in (or other breach of) the primary containment system (including primary LCRS sump) by landfill leachate, LFG or LFG condensate, or any other foreign fluid (e.g., contact storm water, groundwater). The Discharger shall operate, maintain, and monitor all leak detection devices, including all secondary LCRS sumps and all underlying pan lysimeters not open to the unsaturated zone (i.e., pan lysimeters welded to the base of the secondary LCRS sump, hereafter referred to as “welded pan lysimeters” or “WPLs”).

a. Monitoring Points

- i. Landfill 1 – none (unit not constructed with secondary LCRS sump)
- ii. Landfills 2 & 3

Leak detection monitoring at LFs 2 & 3 shall be conducted at the following existing and future monitoring points:

Table A.4.a.ii Leak Detection Monitoring Points: LFs-2 & 3					
<u>Unit</u>	<u>Module</u>			<u>Program</u>	<u>Monitoring Points</u>
	<u>Name</u>	<u>Phase</u>	<u>Status</u>		<u>Secondary Sump</u>
LF-2	DM-2.1	---	Existing	Corrective Action	--- ¹
LF-3	DM-2	2.2A	Existing	Corrective Action	--- ¹
		2.2B			--- ¹
		2.3	Future	Detection	LD-2.3
	DM-10	10.1	Future	Detection	LD-10.1
		10.2			LD-10.2
	DM-11	11.1	Existing	Corrective Action	--- ¹
11.2		--- ¹			
11.3		Future	Detection	LD-11.3	

1. Module/phase not constructed with secondary LCRS sump.

iii. Landfill 4

Leak detection monitoring at LF-4 shall be conducted at the following existing and future monitoring points:

Table A.4.a.iii Leak Detection Monitoring Points: LF-4					
Module			Program	Monitoring Points	
Name	Phase	Status		Secondary Sump	Pan Lysimeter
DM-3	3.1	Existing	Detection & Corrective Action	LD-3.1	WPL-3.1 ¹
	3.2	Existing		LD-3.2	WPL-3.2 ¹
	3.3	Existing		LD-3.3	WPL-3.3 ¹
DM-4	4.1	Existing	Detection & Corrective Action	LD-4.1	WPL-4.1 ^{1,2}
	4.2	Existing			
	4.3	Existing			
DM-5	5.1A	Existing	Detection & Corrective Action	---	---
	5.1B	Existing		---	---
	5.2	Existing		LD-5.2	WPL-5.2 ¹
DM-6	6.1	Existing	Detection	LD-6.1	WPL-6.1 ^{1,2}
	6.2	Existing			
DM-7	7.1	Existing	Detection	LD-Temp	---
	7.2	Future		LD-7.2	---
DM-8	8.1	Future	Detection	LD-8.1	---
	8.2	Future		LD-8.2	---
DM-9	9.1	Future	Detection	LD-9.1	---
	9.2	Future		LD-9.2	---

1. Pan Lysimeter welded to bottom of secondary LCRS sump.
2. All module phases drained by single primary LCRS sump.
3. Module/phase not constructed with secondary LCRS sump.
4. Module/phase not constructed with a welded pan lysimeter.

iv. Waste Pile 9.1 – none (unit not constructed with secondary LCRS sump)

See Attachment D: Leachate & Lysimeter Monitoring.

b. Monitoring Schedule

All leak detection monitoring devices (i.e., secondary LCRS sumps and underlying WPLs) shall be monitored **monthly** for the presence (i.e., depth of) liquid and **semiannually** for the presence of LFG. Any liquid or LFG confirmed to be present in a leak detection monitoring device (as described in Section A.4.c below), including an ongoing or intermittent (e.g., seasonal) leak, shall then be monitored in accordance with Tables A.3.b (liquid) and A.2.b.ii (gas) respectively.

c. Confirmation of a Leak

i. Liquids

If liquid is detected in a leak detection monitoring device, the Discharger shall, within 24-hours, notify Central Valley Water Board staff by telephone or email and, within 7-days, sample and test the liquid for the field and monitoring parameters listed in Table A.3.b. Weekly retest sampling shall be conducted thereafter, as necessary, to confirm the identity of the liquid using the sampling and analysis procedures (including sample analysis profiles) in the most recent updated Sample Collection and Analysis Plan submitted under this MRP.

Within 45 days of the initial detection, the Discharger shall identify the liquid (e.g., leachate, condensate, contact storm water) by comparing the sample results to the background sample analysis profiles as described in the Corrective Action Specifications and submit a written report of the findings to the Central Valley Water Board. Upon approval of this report (i.e., confirmation of the identity of the liquid), the Discharger shall then implement the appropriate response measures under the Corrective Action Specifications and/or as otherwise directed by Central Valley Water Board staff.

ii. Gas

In the event that LFG is detected at levels triggering VOC testing (i.e., methane at or above 1% by volume and/or total organic vapors at or above 50 ppbv), the Discharger shall, within 24-hours, notify Central Valley Water Board staff by telephone or email and, within 7-days, sample for the required LFG field and monitoring parameters listed in Table A.2.b.ii. Weekly retest sampling may be conducted thereafter, as necessary, to assess whether the gas leak is ongoing or intermittent. Confirmation and response procedures for a LFG leak shall be the same as those described above for a liquid leak (i.e., submit report of findings within 45 days, implement appropriate response measures upon approval).

Any liquid or LFG confirmed to be present in a leak detection monitoring device in accordance with the above procedures, shall also trigger the need to investigate whether a release has occurred and/or needs to be addressed consistent with MRP section A.2 and the applicable O&M plans submitted under Facility Specification C.2.

5. Surface Water Monitoring

The Discharger shall install and operate a surface water detection monitoring system to detect a release from the landfill and any resulting impacts to surface water if such a release occurs. Surface water monitoring is specifically required where runoff from waste management unit flows, or could flow, to waters of the United States. The monitoring system shall comply with the applicable provisions of Title 27, sections 20415 and 20420.

Surface water monitoring at the Recology Hay Road Landfill shall be conducted at the following monitoring points, as shown in Attachment G: Drainage Controls & Surface Water Monitoring.

a. Monitoring Points
 i. Surface Water

Table A.5.a.i Surface Water Monitoring Points				
<u>Area</u>	<u>Surface Water</u>	<u>Monitoring Point</u>	<u>Program</u>	<u>Location</u>
LF-1, LF-3, LF-4,& WP-9.1	Alamo Creek A-1 Channel	SW-3	Background	South side of culvert under Hay Road
		SW-4	Background	Upstream of Bird Sanctuary Pond outfall
		SW-7	Detection	Downstream of Bird Sanctuary Pond outfall
	Bird Sanctuary Pond	SW-8	Background	Upstream of LF-3 west of borrow pit discharge
		SW-9	Detection	Discharge into the Bird Sanctuary Pond
		SW-5	Detection	Bird Sanctuary Pond

ii. Storm Water

Storm water monitoring shall be conducted in accordance with the NPDES General Permit for Storm Water Dischargers Associated with Industrial Activities (Water Quality Order NO. 2014-006-DWQ, NPDES No. CAS000001). The Discharger shall submit a copy of the storm water Annual Report with the first semi-annual monitoring report for each year submitted under this program.

b. Monitoring Schedule

Surface water samples (excluding Storm Water samples collected in accordance with Water Quality Order No. 2014-006-DWQ) shall be collected from the above monitoring network and analyzed in accordance with the following schedule using the applicable test methods for each constituent listed in Appendix 1 attached to this Order.

Table A.5.b Surface Water Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters</i>			
pH	pH units	Semiannually	Semiannually
Temperature	degrees F	Semiannually	Semiannually
Turbidity	NTU	Semiannually	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
<i>Monitoring Parameters</i>			
General Minerals			

Table A.5.b			
Surface Water Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Bicarbonate Alkalinity	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Nitrate-N	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Nitrogen Compounds			
Ammonia-Nitrogen	mg/L	Annually	Annually
Total Kjeldahl Nitrogen	mg/L	Annually	Annually
VOCs	ug/L	Semiannually	Semiannually
Dissolved Metals			
Arsenic	ug/L	Semiannually	Semiannually
Chromium (total)	ug/L	Semiannually	Semiannually
Iron	ug/L	Semiannually	Semiannually
Lead	ug/L	Semiannually	Semiannually
<i>Constituents of Concern</i> ¹	---	Every 5 years	Every 5 years

1. See Appendix 1 below.

- c. Leachate Seeps -- Surface water samples shall also be collected and analyzed for the monitoring parameters in the above table when leachate seeps are observed that may have impacted surface water quality. If leachate seeps are identified extending out of the disposal area or that potentially impact on-site drainages, those drainages shall be sampled as close to the leachate as possible (in addition to sampling of the actual leachate seep as required in Section A.3 above).
- d. General Storm Water Permit -- Storm water monitoring shall also be conducted in accordance with the NPDES Industrial Storm Water General Permit (NPDES NO. CAS000001, Order 2014-0057-DWQ).

The above monitoring system meets Title 27 requirements for surface/storm water monitoring.

6. Solid & Semi-Solid Waste Monitoring

The Discharger shall monitor all wastes discharged to the landfill on a quarterly basis and report to the Board as follows:

Table A.6			
Solid & Semi-Solid Waste Monitoring Schedule			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
Unit accepting waste	---	Quarterly	Semiannually
Type(s) of waste	---	Quarterly	Semiannually
Quantity of waste	cu yds. & tons ¹	Quarterly	Semiannually
Moisture content of waste ²	percent	Quarterly	Semiannually
Quantity of cover	cu yds. & tons ¹	Quarterly	Semiannually
Type(s) of cover	---	Quarterly	Semiannually
Elevation range of discharges	Feet & 10ths, NADV 88	Quarterly	Annually
Remaining capacity of unit	%	Quarterly	Annually

1. Tonnage may be estimated based on volume conversion provided volume conversion factor is reported.
2. Required for waste pile and landfill co-disposal operations.

7. Landfill Facility Monitoring

a. Annual Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **15 September**, the Discharger shall conduct an inspection of all classified units at the landfill facility, including landfill units, waste pile, and LTU (as applicable). The inspection shall assess repair and maintenance needed for drainage control systems, cover systems, and groundwater monitoring wells; and shall assess preparedness for winter conditions (including but not limited to erosion and sedimentation control). The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be completed by **31 October** in accordance with the **Annual Winterization Plan** submitted under the WDR Facility Specifications. Annual facility inspection reporting shall be submitted as required in Section B.5 of this MRP.

b. Major Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities and all unit side slopes for damage **within 7 days** following major storm events capable of causing damage or significant erosion. The Discharger shall take photos of any problems areas before and after repairs. Necessary repairs shall be completed **within 30 days** of the inspection. Notification and reporting requirements for major storm events shall be conducted as required in Section B.6 of this MRP.

c. Five-Year Topographic Surveys

The most recent aerial topographic survey of the site was conducted in April 2015.

i. Active Units

For active units, or portions thereof, the Discharger shall provide copies of topographic maps obtained from 5-year aerial topographic surveys conducted

under Title 27, section 21570(f) (10). The most recent topographic survey of the active landfill units (LFs-1 through 4) was conducted in April 2015. The first 5-year topographic survey of the active units at the site conducted under this Order shall therefore be completed by **30 April 2020**. Subsequent topographic surveys of the active units under this Order shall be coordinated with surveys conducted on the closed units (i.e., by **15 November 2025** and **every five years** thereafter).

ii. Closed Units

Title 27 requires that the Discharger conduct an initial final cover topographic survey upon completion of closure or partial closure and at least every five years thereafter. The purpose of the survey is to track differential settlement of the landfill's low hydraulic conductivity (LHC) layer of the cover. The Discharger is also required to produce an iso-settlement map accurately depicting the estimated total change in elevation of each portion of the final cover's LHC (or engineered alternative cover, as applicable).

WDR Closure and Postclosure Specifications require that LF-1 be closed by 15 October 2021. The first postclosure topographic survey for LF-1 under this Order shall therefore be completed by **15 November 2021**. Subsequent topographic surveys for LF-1 shall be conducted by **15 October 2025** and at least **every five years** thereafter.

Reporting of the above shall be in accordance with Section B.7 of this MRP.

d. Standard Observations

The Discharger shall conduct Standard Observations at all classified units at the site (i.e., landfills, waste pile & LTU) in accordance with this section of the MRP. Standard observations shall be conducted weekly during the wet season (1 October to 30 April) and monthly during the dry season (1 May to 30 September).

The Standard Observations shall include:

i. For the units:

- (1) Evidence of ponded water at any point on the unit outside of any contact storm water/leachate diversions structures on the active face (show affected area on map); and
- (2) Evidence of erosion and/or of day-lighted refuse.

ii. Along the perimeter of the units:

- (1) Evidence of leachate seeps, estimated size of affected area, and flow rate (show affected area on map); and
- (2) Evidence of erosion and/or of day-lighted refuse.

iii. For receiving waters:

- (1) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area; and

- (2) Discoloration and turbidity - description of color, source, and size of affected area.

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

Landfill Facility Monitoring shall also include continuous leachate seep monitoring under Section A.3.c.

8. Additional Corrective Action Monitoring

a. LFG Extraction

LFG extraction monitoring shall be conducted to assess the nature and source of impacts at the site; to provide an ongoing assessment as to the effectiveness of existing landfill gas controls in mitigating that source; and to evaluate the possible need for additional corrective action measures to protect underlying water bearing media.

i. Monitoring Points

LFG extraction monitoring shall be conducted at the following monitoring points in the LFG extraction system:

(1) LF-1

- (A) Gas Extraction Wells -- GEWs 28 through 41
- (B) Leachate Wells -- LWs 1, 2 & 3
- (C) LCRS Sumps - S-1

(2) LF-2

- (A) Gas Extraction Wells -- GEWs 7, 8R, 25 & 52;
- (B) LCRS Sumps -- S-2.1

(3) LF-3

- (A) Gas Extraction Wells -- GEWs 1 through 6; 9R, 10R, 11, 11R, 12; 23, 24, 26 and 53 through 57
- (B) LCRS Sumps -- S-2.1, S-2.2A, S-2.2B, S-11.1, & S-11.2

(4) LF-4

- (A) Gas Extraction Wells -- GEWs 13 through 22; GEWs 42 through 51; and GEWs 58 through 67.
- (B) LCRS Sumps -- S-3.2, S-3.3, S-4.1, S-5.1A, S-5.1B, S-5.2, and S-6,

The LFG monitoring network shall also include the sampling port of the gas header(s) at each landfill unit and all future LFG extraction wells and primary LCRS sumps installed at the landfill units at the site.

ii. Monitoring Schedule

Extracted LFG samples shall be collected from the above monitoring network and analyzed in accordance with the following schedule using the applicable test methods.

**TABLE A.8
 LANDFILL GAS CONTROL SYSTEM MONITORING PROGRAM**

<u>LFG Control System Parameter</u>	<u>Units</u>	<u>Monitoring Frequency</u>
Parameters		
LFG Control System Run-time	Hours	Monthly
LFG Control System Down-time	%	Monthly
Temperature into Plant	⁰ F	Monthly
Flare Combustion Temperature	⁰ F	Monthly
System Vacuum	mm Hg vacuum	Monthly
Totalized flow into Plant	Cubic Feet	Monthly
Totalized flow rate into Plant	CFM	Monthly
LFG System Influent Monitoring Parameters		
Volatile Organic Compounds (USEPA Method TO-15)	ug/cm ³	Semiannually
Methane	%	Semiannually
<u>Parameter</u>	<u>Units</u>	<u>Monitoring Frequency</u>
Field Parameters for LFG Extraction Points¹		
Weather Conditions		Monthly
Atmospheric Temperature	⁰ F	Monthly
Atmospheric Pressure	inches Hg	Monthly
Gas concentrations at each well/point		
Methane	% by volume	Monthly
Carbon Dioxide	% by volume	Monthly
Oxygen	% by volume	Monthly
Remainder gas	% by volume	Monthly
Gas temperature at each well	⁰ F	Monthly
Gas Pressure at each well		
Initial static pressure in wellhead	inches H2O	Monthly
Adjusted static pressure in wellhead	inches H2O	Monthly
Monitoring Parameters for LFG Monitoring		
Volatile Organic Compounds (USEPA Method TO-15)	ug/cm ²	Semiannually

Notes:

- Attachment F shows the LFG monitoring locations and designations.
- VOC monitoring shall be limited to LFG samples collected from the LF-1 gas header.
- Monthly and semi-annual monitoring results required in Table A.8 shall be reported in the semi-annual monitoring reports.

All shutdowns of the landfill gas extraction system, regardless of the type of restart, shall be summarized and tabulated in the semiannual reports. The summary shall include the start/stop dates, and the cause of the shutdown. In addition, the LFG plant run-time per month and percent down-time per month shall be reported and tabulated in each semiannual report.

b. LFG Condensate

i. Monitoring Points

LFG condensate monitoring shall be conducted at the LFG condensate sumps for LFG extracted from each landfill unit/module, as follows:

<u>Landfill</u>	<u>Modules</u>	<u>Module Status</u>	<u>Condensate Sump</u>
LF-1	DMS-1A & 1B	Existing	CS-4
LF-2	DM-2.1	Existing	CS-1
LF-3	DMS-2.2, 11.1 & 11.2	Existing	CS-1
LF-3	DMS-2.3, 10 & 11.3 ²	Future	--- ²
LF-4	DMS-3 & 4.1	Existing	CS-2
LF-4	DMS-4.3, 6 & 7.1 ¹	Existing	--- ¹
LF-4	DMS-4.1, 4.2 & 5	Existing	CS-3
LF-4	DMS-8 & 9 ²	Future	--- ²
All	All existing modules	Existing	CS-5

1. Gas controls not yet installed at these modules.
2. Future modules.

LFG condensate monitoring shall also be conducted at all future LFG condensate sumps installed as part of the existing or future LFG extraction system. LFG condensate recovered from each landfill unit shall be handled as leachate consistent with the Discharge Prohibitions and the Landfill Liquids Management Plan, as approved by Central Valley Water Board staff.

c. Groundwater Remediation Projects

i. Nitrate-N Plume(s)

Monitoring and reporting of remediation of the existing nitrate-N plume shall be in accordance with General Order R5-2008-0149-056 (*General Waste Discharge Requirements for In-situ Groundwater Remediation at Sites with Volatile Organic Compounds, Nitrogen Compounds, Perchlorate, Pesticides, Semi-volatile Organic Compounds and/or Petroleum Compounds*, adopted 11 September 2008).

ii. Future

Monitoring and reporting for any future remediation projects shall be similarly handled in accordance with the above General Order and the Notice of Applicability for a given project, as applicable, or with any specific Order issued to the Discharger.

d. Borrow Pit Dewatering

The Discharger performs dewatering activities at an area referred to as the "Borrow Pit" in order to harvest earthen material for landfill cover and base liner

construction. The Discharger has installed a pump to dewater the borrow pit and to discharge the water. These activities are regulated by the Water Board under the *General Order for Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water* (Limited Threat General Order). The Discharger is required to comply with all the requirements of the Limited Threat General Order, including operation and maintenance requirements. In addition to the requirements of the Limited Threat General Permit, for each semiannual monitoring report required under this MRP, the Discharger shall monitor and report the following for the Borrow Pit:

- i. The monthly flows of groundwater extracted from the borrow pit shall be tabulated and reported in the semiannual monitoring reports.
- ii. If groundwater wells between the borrow pit and nitrate impacted areas have confirmed detections of Nitrate-nitrogen, nitrite-nitrogen, total Kjeldahl nitrogen above concentration limits, then the Discharger shall monitor the borrow pit discharge for these nitrogen constituents.
- iii. If groundwater wells between the borrow pit and the landfill units have confirmed detections of VOCs that are identified from the landfill, the Discharger shall monitor the borrow pit discharge for VOCs.

9. Compost Pond Monitoring

a. Leachate/Wastewater

- i. Monitoring Points – Ponds A & B
- ii. Monitoring Schedule

The Discharger shall monitor Compost Ponds A and B in accordance with the table below:

Table A.9.a.ii			
Compost Pond Monitoring			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<i>Field Parameters</i>			
Action Level (0, 1, 2 or 3) ¹	---	Weekly ²	Semiannually
Freeboard ³	feet and tenths, NADV88	Weekly ²	Semiannually
Liquid Level	feet and tenths, NADV88	Weekly ²	Semi-Annually
Volume pumped from ponds:			
Pond A to Pond B	gallons	Weekly	Semi-Annually

Table A.9.a.ii			
Compost Pond Monitoring			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
Onsite reuse - location and volume	Gallons, location	Weekly	Semi-Annually
Storage Tanks	gallons	Weekly	Semi-Annually
Offsite Disposal - location and volume	Gallons, location	Weekly	Semi-Annually
pH	pH units	Quarterly	Semi-Annually
Turbidity	Turbidity units	Quarterly	Semi-Annually
Electrical Conductivity	ug/L	Quarterly	Semi-Annually
Dissolved Oxygen	mg/L	Quarterly	Semi-Annually
<i>Monitoring Parameters</i>			
Total Dissolved Solids	mg/L	Semi-Annually	Semi-Annually
Fixed Dissolved Solids	mg/L	Semi-Annually	Semi-Annually
Biochemical Oxygen Demand	mg/L	Semi-Annually	Semi-Annually
Chloride	mg/L	Semi-Annually	Semi-Annually
Sulfate	mg/L	Semi-Annually	Semi-Annually
Nitrate-N	mg/L	Semi-Annually	Semi-Annually
Ammonia-N	mg/L	Semi-Annually	Semi-Annually
Total Kjeldahl Nitrogen	mg/L	Semi-Annually	Semi-Annually
Total Phosphorous	mg/L	Semi-Annually	Semi-Annually
Total Coliform Organisms ⁴	MPN/100 mL	Semi-Annually	Semi-Annually

1. Action level under approved interim or final Compost Facility O&M Plan. The Discharger shall provide a log or other brief description of the activities conducted under each action level, as reported,
2. Monitoring for this parameter shall also be conducted within 24 hours of storm event producing more than two inches of rainfall in a 24 hour period.
3. Freeboard shall be measured from the top of the surface impoundment down to the water level in the impoundment and can be measured using markings on the primary geomembrane liner or a free-standing gauge.
4. Using a minimum of 15 tubes, or three dilutions.

b. Groundwater

- i. Monitoring Points -- The groundwater monitoring points for the compost ponds shall include the following existing and future wells:

Table A.9.b.i			
Compost Pond Monitoring Points			
<u>Pond</u>	<u>Well</u>	<u>Program</u>	<u>Location</u>
A	G-4R ¹	Background	Upgradient
	CP-1 ²	Detection	Downgradient
B		Background	Upgradient
	CPs 2 & 3 ²	Detection	Downgradient

1. Existing monitoring well.

2. Future monitoring wells to be installed in the uppermost saturated interval, as approved by Water Board staff.

- ii. Monitoring Schedule - Same as Table A.9.a.ii, except for action level, freeboard, and liquid level (not applicable to groundwater monitoring).

10. Compost Facility Monitoring

a. Annual Inspection

No later than **15 September** each year, the Discharger shall conduct an **annual** inspection of the compost facility to confirm that all drainage, containment, operating and monitoring systems/structures (e.g., working surfaces, berms, ditches, ponds, sumps, monitoring wells) are prepared for the pending wet season. The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, and/or repairs of these structures and systems shall be completed by **31 October** in accordance with the **Annual Winterization Plan** submitted under the WDR Facility Specifications. Annual facility inspection reporting shall be submitted as required in Section B.5 of this MRP.

b. Major Storm Events

The Discharger shall inspect all leachate/storm water drainage and containment facilities, including, but not necessarily limited to, leachate pad, sumps and ditches, containment berms, precipitation and drainage controls; and adjacent areas for damage **within 7 days** following major storm events. Necessary repairs shall be completed **within 30 days** of the inspection. The Discharger shall report any damage and subsequent repairs including photographs of the problem and repairs in the Annual Monitoring Report required under Section B.3 of this MRP.

c. Monthly O&M Inspections

The Discharger shall conduct **monthly** O&M inspections of the compost facility and submit the following observations and records in the Annual Monitoring and Maintenance Report:

- i. Date and time of inspections along with name of inspector;
- ii. The overall condition of the compost facility's drainage, operations, and containment systems, including leachate pad; concrete-lined sumps & ditches; pumps & pipelines; storm water controls; containment system berms & liners (e.g., leachate pad, compost ponds); storage tanks, and all other related

facilities;

- iii. The available capacity within storage systems and the current volume of wastewater (gallons) or solids (cubic yards) contained;
- iv. Action levels triggered/executed during the monitoring under the approved Leachate Collection System/Pond O&M Plan (interim or final, as applicable) described in WDR Finding 168;
- v. Standard Observations for all applicable items listed in Section A.7.d;
- vi. Volume of wastewater discharged or re-used onsite; and
- vii. Volume of wastewater disposed at an off-site treatment system and name and location of the WWTP, if applicable.

The results of monthly O&M inspections of the compost facility shall be submitted in the semiannual monitoring reports required under Section B.2 of this MRP.

B. REPORTING

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

Reporting Schedule			
<u>Section</u>	<u>Report</u>	<u>End of Reporting Period</u>	<u>Due Date</u>
B.2	Semiannual Monitoring Report	30 June & 31 December	1 August, 1 February
B.3	Annual Monitoring Report	31 December	1 February
B.4	Seep Reporting	Continuous	Immediately & Within 7 Days
B.5	Annual Facility Inspection Report	31 October	15 November
B.6	Major Storm Event Reporting	Continuous	Immediately & 14 days from damage repair
B.7	5-Year Topographic Survey & Iso-Settlement Maps	Upon closure	15 November 2021 (LF-1) 15 December 2020 (LF-2)
		30 April 2020	30 May 2020 (LFs-3 & 4)
		15 November 2024 & Every 5 Years	15 December 2025 & Every 5 years thereafter (All units)

Reporting Requirements

1. General

The results of **all monitoring** conducted under this Order shall be reported to the Central Valley Water Board in accordance with the reporting schedule above for the

calendar period in which samples were taken or observations made. All reports shall include the data and information required for that report in this Monitoring and Reporting Program and as required in WDRs Order R5-2016-0056 and the Landfill and Industrial SPRRs, particularly the monitoring and response to release provisions (i.e., WDR Section H and SPRR Sections I and J). In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Field and laboratory sheets shall be reported in each monitoring report.

All monitoring reports, technical reports, and analytical data required under this MRP and described herein shall be submitted in electronic form in accordance with WDR Provision H.15.

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

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

Required Reports

2. Semiannual Monitoring Report

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

- a. For each groundwater monitoring point addressed by the report, a description of:
 - i. The time of water level measurement;
 - ii. The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
 - iii. The method of purging used to stabilize water in the well bore before the sample is taken including the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; results of pH,

- temperature, conductivity, and turbidity testing; and the method of disposing of the purge water;
- iv. The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
 - v. A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.
- b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
 - c. Groundwater elevation contour and flow stream maps showing groundwater elevations and the directions of groundwater flow in the uppermost aquifer and in any additional zones of saturation based upon quarterly groundwater elevation monitoring prior to sampling. Corresponding estimates of groundwater gradients and flow velocity shall also be provided.
 - d. Tabulated monitoring data for the monitoring period for all classified units/modules, both compost facility ponds, all monitoring points, all field and monitoring parameters, all 5-year COCs, as applicable, and all monitored media (e.g., groundwater, unsaturated zone, leachate, gas, and surface water). Concentrations below the laboratory reporting limit shall not be reported as "ND" unless the reporting limit is also given in the table. Otherwise they shall be reported "<" the reporting limit (e.g., <0.10). Units shall be as required in Tables I through IV unless specific justification is given to report in other units. Refer to the SPRRs Section I "Standard Monitoring Specifications" for requirements regarding MDLs and PQLs.
 - e. Laboratory statements of results of all analyses evaluating compliance with requirements.
 - f. An evaluation of the concentration of each monitoring parameter (or 5-year COC when five year COC sampling is conducted) as compared to the current concentration limits, and the results of any required verification testing for constituents exceeding a concentration limit. Report any actions taken under SPRRs Section J: Response to a Release for verified exceedances of a concentration limit for wells/constituents not already in corrective action monitoring.
 - g. Identification of any gas or liquid detected in a leak detection monitoring device or pan lysimeter based on the fluid sample analysis profiles provided in the Sample Collection and Analysis Plan consistent with the corrective action specifications of this Order.
 - h. An evaluation of the effectiveness of run-off/run-on control facilities.
 - i. The results of landfill and compost facility monitoring required under Sections A.7.d (landfill standard observations) and A.10.c (compost facility monthly O&M inspections) of this MRP.
 - j. The results of solid and semi-solid waste monitoring required under Section A.6.

- k. A discussion as to the effectiveness of corrective action per Title 27, section 20430(h).

3. Annual Monitoring Report

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

- a. All monitoring parameters shall be graphed to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous 10 calendar years. If a 5-year COC event was performed, than these parameters shall also be graphically presented for the entire history of COC monitoring. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. Constituent monitoring data of incompatible scales/ranges shall not be plotted on the same graph. The graphs shall plot each datum, rather than plotting mean values. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
- b. An evaluation of the monitoring parameters with regards to the cation/anion balance, and a graphical presentation using a Stiff diagram, a Piper graph, or a Schoeller plot.
- c. Cumulative historical monitoring data organized per B.2.d in an electronic data format amenable to statistical analysis (i.e., Excel). See Title 27, section 20420(h).
- d. Hydrographs of each well showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.
- e. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
- f. A written summary of the monitoring results, indicating any changes made or observed since the previous Annual Monitoring Report.
- g. Updated concentration limits for each monitoring parameter at each monitoring well based on the new data set.
- h. A comprehensive discussion of the Corrective Action Program(s), including corrective action measures implemented at each unit, as applicable.
- i. For the purpose of identifying fluid detected in a pan lysimeter or leak detection sump, updated sample analysis profiles (based on current and historical

monitoring data) for each fluid (e.g., leachate; contact storm water, LFG) that could potentially be detected in a pan lysimeter or leak detection sump at the site. See WDR Corrective Action Specification D.6.

4. Seep Reporting

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

- a. A map showing the location(s) of seepage;
- b. An estimate of the flow rate;
- c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);
- d. Verification that samples have been submitted for analyses of the Field Parameters and Monitoring Parameters listed in Table A.3.b of this MRP, and an estimated date that the results will be submitted to the Central Valley Water Board; and
- e. Corrective measures underway or proposed, and corresponding time schedule.

5. Annual Facility Inspection Reporting

By **15 November** of each year, the Discharger shall submit an Annual Facility Inspection Report describing measures implemented under the approved Annual Winterization Plan, including inspections and repairs, preparations for winter, and include photographs of any problem areas and the repairs. See Sections A.7.a and A.10.a.

6. Major Storm Event Reporting

Following major storm events capable of causing damage or significant erosion, the Discharger **immediately** shall notify Central Valley Water Board staff of any damage or significant erosion upon discovery and report subsequent repairs within **14 days** of completion of the repairs, including photographs of the problem and the repairs. Refer to Sections A.7.b and A.10.b of this MRP.

7. 5-Year Topographic Survey(s)

By **15 December 2021**, the Discharger shall submit the initial postclosure topographic surveys conducted under this Order for LF-1. Each report shall include topographic survey and a base-line iso-settlement map for the closed unit. By **30 June 2020**, the Discharger shall also submit a report of results for the first topographic map of the active units conducted under this Order showing the development contours of LF-3 and LF-4. Subsequent topographic reports for the site, including both active and closed units, shall be submitted by **15 December 2025**, and at least **every five years** thereafter, and may be combined in a single report. See MRP Section A.7.c.

C. WATER QUALITY PROTECTION STANDARD

The Water Quality Protection Standard for the landfill unit shall consist of all Constituents of Concern (COCs), Concentration Limits, the Point of Compliance, and all Monitoring Points consistent with this Order and Title 27, Section 20390.

1. Water Quality Protection Standard Report

By **30 November 2016**, the Discharger shall submit an updated Water Quality Protection Standard (WQPS) Report proposing a WQPS for each classified unit at the site consistent with the Findings and Requirements of this Order. At a minimum, the report shall include the following information:

- a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a waste management unit or portion of a unit. This list shall include at least the uppermost aquifer, unsaturated zone, and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).
- c. A map showing the monitoring points and background monitoring points for groundwater, the unsaturated zone, and surface water for each unit. The map shall show the point of compliance for each unit in accordance with Title 27, section 20405.
- d. Listings/tables showing all elements of the WQPS for each unit and water bearing media, including, but not limited to, concentration limits for all monitoring parameters and 5-year COCs. See Standard Monitoring Specification I.25, SPRR.
- e. Proposed data analysis methods for calculating concentration limits for naturally-occurring monitoring parameters and constituents of concern detected (i.e., constituents detected in 10% or greater of the background data) per Title 27, section 20415(e)(8)(A-D) or section 20415(e)(8)(E). See WDR Monitoring Specification H.6.
- f. A retesting procedure to confirm or deny measurably significant evidence of a release pursuant to Title 27, section 20415(e)(8)(E) and section 20420(j)(1-3).

Once approved, the concentration limits of the WQPS shall be annually updated to reflect current background monitoring data using the approved data analysis methods. Any subsequent proposed changes to the WQPS, other than annual update of the concentration limits shall be submitted in the form of a revised WQPS report for review and approval by the Executive Officer. The WQPS shall be certified by a California-registered civil engineer or geologist as meeting the requirements of Title 27.

2. Monitoring Parameters

Monitoring parameters are a select group of constituents that are monitored during each monitoring event that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a waste management unit. The monitoring parameters for all waste management units are those listed in Table A.1.c (groundwater), Table A.2.a.ii (soil pore water),

Table A.3.b (classified unit leachate); Table A.2.b.ii (soil pore gas), Table A.5.b (surface/storm water), A.8.a.ii (landfill gas) and A.9.b.ii (Compost Pond Liquid). The WQPS shall further identify which monitoring parameters are in Detection Monitoring and which are in Corrective Action monitoring.

3. Constituents of Concern (COCs)

The COCs include a larger group of waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit, and are required to be monitored at least every five years [Title 27, sections 20395 and 20420(g)]. The COCs for all waste management units at the facility are referenced in Table A.1.c (groundwater), Table A.2.a.ii (soil pore water), Table A.3.b (leachate), and Table A.5.b (surface/storm water); and listed along with laboratory test methods in Appendix 1 (attached). The WQPS shall further identify which COCs are in Detection Monitoring and which are in Corrective Action monitoring.

The Discharger shall monitor all COCs every 5 years (or more frequently if required in a Corrective Action Program). The previous 5-year COC monitoring event was conducted in September 2015. The next 5-year COC monitoring event shall therefore be conducted by **30 October 2020** and the results reported in the Second Half and Annual 2020 monitoring report due by **1 February 2021**.

4. Concentration Limits

As noted in the WDR Findings, the Discharger does not yet have a complete list of approved concentration limits for naturally occurring constituents and the WQPS for the site needs to be updated. Proposed concentration limits for all water bearing media (e.g., surface water and groundwater) shall therefore be included in the revised WQPS Report required under the WDR Provisions.

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined by calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or by an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).

a. Detection Monitoring

- i. Non-naturally occurring COCs - The concentration limits for non-naturally-occurring constituents of concern, including organic compounds (e.g., VOCs and dissolved metals not detectable in background), shall be non-detect.
- ii. Naturally Occurring COCs - The concentration limits for naturally-occurring COCs (e.g., general minerals and dissolved metals detectable in background) shall be determined by statistical analysis of upgradient monitoring data for the eastern site area and historical background for intrawell comparisons in the western site area. The revised WQPS shall demonstrate whether the use of intrawell monitoring on the west half of the facility is consistent with Title 27, Section 20080(b) and (c), and if not consistent with Title 27, propose to change the detection groundwater monitoring to interwell comparisons using hydraulically upgradient wells as background.

The data analysis method for calculating concentration limits for naturally-occurring COCs under this Order shall be the interwell/intrawell Tolerance Limit Method, or as otherwise proposed in the revised WQPS Report and approved by Board staff. Concentration limits for naturally occurring COCs shall be updated annually and included in the Annual Monitoring Report submitted under Section B.3.g of this MRP.

b. **Corrective Action Monitoring**

The concentration limits for corrective action monitoring shall be the same as those for detection monitoring absent approval of a proposal for concentration limits greater than background (CLGBs) under Title 27 Section 20400(c) and revision of the WDRs. Time series plots and an intrawell statistical procedure (e.g., the Sens Slope Method) shall be used for trend analysis to monitor corrective action progress.

5. Point of Compliance

The Point of Compliance for the water standard at each waste management unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the unit. The Point of Compliance wells for each classified unit at the site shall be the downgradient and side gradient wells listed for each unit in Section A.1.

6. Compliance Period

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

7. Monitoring Points

A monitoring point is a well, device, or location specified in the waste discharge requirements at which monitoring is conducted and at which the Water Quality Protection Standard applies. The monitoring points for each monitored medium at the site are listed in Sections A.1 (groundwater), A.2.a.i (soil pore liquid), A.2.b.i (soil pore gas), and A.5.a.i (surface water) of this MRP. The WQPS shall further identify which monitoring points are in Detection Monitoring and which monitoring points are in Corrective Action monitoring.

APPENDIX 1		
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS		
Constituent of Concern	USEPA TEST Method	Concentration Limit¹
General Minerals (mg/L)		
Bicarbonate Alkalinity	2320B	---
Calcium	200.7/600	---
Carbonate	2320B	---
Chloride	300	---
Magnesium	200.7/600	---
Nitrate-N – Nitrogen	300	---
Phosphate	300	---
Potassium	200.7/600	---
Sodium	200.7/600	---
Sulfate	300	---
Nitrogen Compounds		
Ammonia Nitrogen	4500-NH ₃	0.56
Total Kjeldahl Nitrogen	4500-N-org	18
Nitrite Nitrogen	300	5
Other Parameters		
Chemical Oxygen Demand	410.4	---
Fecal Coliform	9221B	---
Phosphorus	365.3	---
Total Alkalinity	2320B	---
Fixed Dissolved Solids	2540E	---
Total Dissolved Solids	2540C	---
Total Organic Carbon	415.1	---
Dissolved Inorganics (µg/L)		
Aluminum	6010	---
Antimony	7041	---
Arsenic	7062	50
Barium	6010	---
Beryllium	6010	---
Cadmium	7131A	---

Chromium (total)	6010	35
Cobalt	6010	---
Copper	6010	---
Cyanide	9010C	---
Iron	6010	---
Lead	7421	---
Manganese	6010	---
Mercury	7470A	---
Nickel	7521	---
Selenium	7742	---
Sulfide	9030B	---
Silver	6010	---
Thallium	7841	---
Tin	6010	---
Vanadium	6010	---
Zinc	6010	---
Constituent of Concern	USEPA TEST Method	Concentration Limit
Volatile Organic Compounds (µg/L)	8260B	ND
Acetone		
Acetonitrile (Methyl cyanide)		
Acrolein		
Acrylonitrile		
Allyl chloride (3-Chloropropene)		
Benzene		
Bromochloromethane (Chlorobromomethane)		
Bromodichloromethane (Dibromochloromethane)		
Bromoform (Tribromomethane)		
Carbon disulfide		
Carbon tetrachloride		
Chlorobenzene		
Chloroethane (Ethyl chloride)		
Chloroform (Trichloromethane)		
Chloroprene		
Dibromochloromethane (Chlorodibromomethane)		
1,2-Dibromo-3-chloropropane (DBCP)		
1,2-Dibromoethane (Ethylene dibromide; EDB)		
o-Dichlorobenzene (1,2-Dichlorobenzene)		
m-Dichlorobenzene (1,3-Dichlorobenzene)		
p-Dichlorobenzene (1,4-Dichlorobenzene)		
trans- 1,4-Dichloro-2-butene		

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

Trichloroethylene (Trichloroethene; TCE)		
Trichlorofluoromethane (CFC- 11)		
1,2,3-Trichloropropane		
Vinyl acetate		
Vinyl chloride (Chloroethene)		
Xylene (total)		
Semi-Volatile Organic Compounds (µg/L):	8270	ND
Acenaphthene		
Acenaphthylene		
Acetophenone		
2-Acetylaminofluorene (2-AAF)		
Aldrin		
4-Aminobiphenyl		
Anthracene		
Benzo[a]anthracene (Benanthracene)		
Benzo[b]fluoranthene		
Benzo[k]fluoranthene		
Benzo[g,h,i]perylene		
Benzo[a]pyrene		
Benzyl alcohol		
Bis(2-ethylhexyl) phthalate		
alpha-BHC		
beta-BHC		
delta-BHC		
gamma-BHC (Lindane)		
Bis(2-chloroethoxy)methane		
Bis(2-chloroethyl) ether (Dichloroethyl ether)		
Bis(2-chloro-1-methylethyl) ether; DCIP)		
4-Bromophenyl phenyl ether		
Butyl benzyl phthalate (Benzyl butyl phthalate)		
Chlordane		
p-Chloroaniline		
Chlorobenzilate		
p-Chloro-m-cresol (4-Chloro-3-methylphenol)		
2-Chloronaphthalene		
2-Chlorophenol		
4-Chlorophenyl phenyl ether		
Chrysene		
o-Cresol (2-methylphenol)		
m-Cresol (3-methylphenol)		
p-Cresol (4-methylphenol)		

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

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

sym-Trinitrobenzene		
Chlorophenoxy Herbicides (µg/L)	8151A	ND
2,4-D (2,4-Dichlorophenoxyacetic acid)		
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)		
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)		
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)		
Organophosphorus Compounds	8141B	ND
Atrazine		
Chlorpyrifos		
0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)		
Diazinon		
Dimethoate		
Disulfoton		
Methyl parathion (Parathion methyl)		
Parathion		
Phorate		
Simazine		

1. "----" denotes concentration limit not yet established for this constituent.

INFORMATION SHEET

ORDER R5-2016-0056
RECOLOGY HAY ROAD
RECOLOGY HAY ROAD, DBA JEPSON PRAIRIE ORGANICS
RECOLOGY HAY ROAD LANDFILL
SOLANO COUNTY

Background

The Recology Hay Road Landfill is an active, Class II, municipal solid waste (MSW) landfill along Hay Road near Highway 113 approximately 8 miles southeast of Vacaville in Solano County. The landfill has been in operation since 1964, accepting household, commercial, industrial, construction and demolition, and other designated, nonhazardous or inert wastes requiring special handling (e.g., treated wood wastes, Title 22 special wastes, asbestos). A site previously operated as a burn dump from 1967 to 1972. In addition to landfill units, the facility also includes a de-watered sewage sludge storage unit, a sludge drying area, and an onsite compost facility.

Geology

The northeast part of the site is underlain by Younger Alluvium (sandy silts), while the remainder of the site is underlain by Older Alluvium (silts and clays with sand and gravel lenses) up to 130 feet thick. The Tehama formation (primarily of silts and clays) underlies the Older Alluvium.

Unit Classifications

There are five landfill units at the facility as follows:

1. LF-1 -- An existing Class III unit (44.5 acres);
2. LF-2 -- Class III unit (14.7 acres);
3. LF-3 -- Class II unit (26.4-acres) with full build out to 89.1 acres; and
4. LF-4 -- Class II unit (77.9-acres) with full build out to 118.9 acres.

The facility also includes a 7-acre, Class II waste pile unit (WP-9.1) and a 3.2-acre, Class II Land Treatment Unit (LTU). WP-9.1 is used for storing the de-watered sludge during the wet season, while the LTU was historically used for drying the sludge during the dry season. The LTU and the eastern half of WP-9.1 are no longer in operation and are currently in the process of being clean closed per Title 27 regulations. The remainder (i.e., west half) of WP-9.1 and all of the landfill units at the facility remain active.

Groundwater

Site-wide, the depth to groundwater varies from about 5 to 36 feet bgs, averaging about 10 feet bgs (10 feet MSL). The Discharger must de-water units on the western half of the site to meet Title 27 requirements for minimum separation between wastes and groundwater (5 feet). De-watering is accomplished by pumping groundwater from the bottom of a large borrow pit immediately west of the facility. The pumping creates a cone of depression in the water table extending across the western half of the site. On the eastern half of the site, groundwater resumes its natural course to the southeast. The pump gradient is about 10 times steeper (0.013 ft/ft) than the natural gradient (0.0013) ft/ft. There are currently 10 LF-1 monitoring wells, nine LF-2/LF-3 monitoring wells, and 10 LF-4 monitoring wells.

Corrective Action

VOCs have been historically detected in groundwater at the site, including alcohols & ethers (e.g., tert-Butyl Alcohol and MTBE), ketones (e.g., acetone), Freon compounds (e.g., Freon 12), and halogenated VOCs and other VOCs at average concentrations up to 40 µg/L, 10 µg/L, 7 µg/L, 3 µg/L, and 5 µg/L, respectively. In 2010, the Discharger installed a landfill gas extraction system at the site that presently includes 66 LFG extraction wells in the landfill units. Extracted LFG is routed to a gas-to-energy plant in the northeast part of the site. Since implementation of LFG controls, the concentrations of VOCs in most of the wells have been reduced to non-detect levels, indicating LFG a likely source of VOC impacts at the site. Other corrective action measures implemented at the site include groundwater extraction to address an historical leachate release from WP-9.1 and bioremediation of historical nitrate-N plumes on the east and west sides under a general remediation order.

Revised WDRs

These revised WDRs include a compliance schedule for closure of LF-1, requiring that the Discharger submit a Final Closure and Postclosure Maintenance Plan (FC/PCMP) for LF-1 by **15 October 2019** and complete closure of LF-1 by **15 October 2021**.

Construction Specifications in the revised WDRs specify prescriptive standard and authorized EADs for closure of landfill units and construction of new LF-3 and LF-4 modules/phases. Such designs include landfill cover, base liner, side slopes, LCRS sumps, and areas of overlap between landfill units. The LCRS sumps are also required to be double-compositely lined. The Discharger is also required to operate all existing classified units and DM-7.2, except for LF-1 and the LTU, in accordance with the EAD/Ss approved for those units/modules under previous WDRs. LF-1, the LTU and all new landfill modules/units are required to be operated in accordance with Title 27 prescriptive standards (i.e., 5 feet minimum separation).

The WDRs also require submission of operations and maintenance (O&M) Plans for various landfill systems/operations (e.g., LFG controls, LCRS sump, liquids management, waste/materials reuse, site winterization) to help ensure that such systems/operations are in compliance with the WDRs and applicable sections of Title 27 and Subtitle D. Corrective action specifications in the WDRs require that the Discharger develop sample analysis profiles of all fluids that could potentially be detected in a leak detection device and/or pan lysimeter at the site to assist in identification of any such fluid(s), in the event of a leak or release, and incorporate any applicable O&M plans into required responses.

The WDRs also require that the Discharger submit an updated Water Quality Protection Standard (WQPS) Report reflecting the revised landfill unit designations of this Order and adequately demonstrate that the use of intrawell monitoring is consistent with Title 27, Section 2008(b) and (c), and if not consistent with Title 27, propose to change the detection groundwater monitoring to interwell comparisons using hydraulically upgradient wells as background.

Other Units

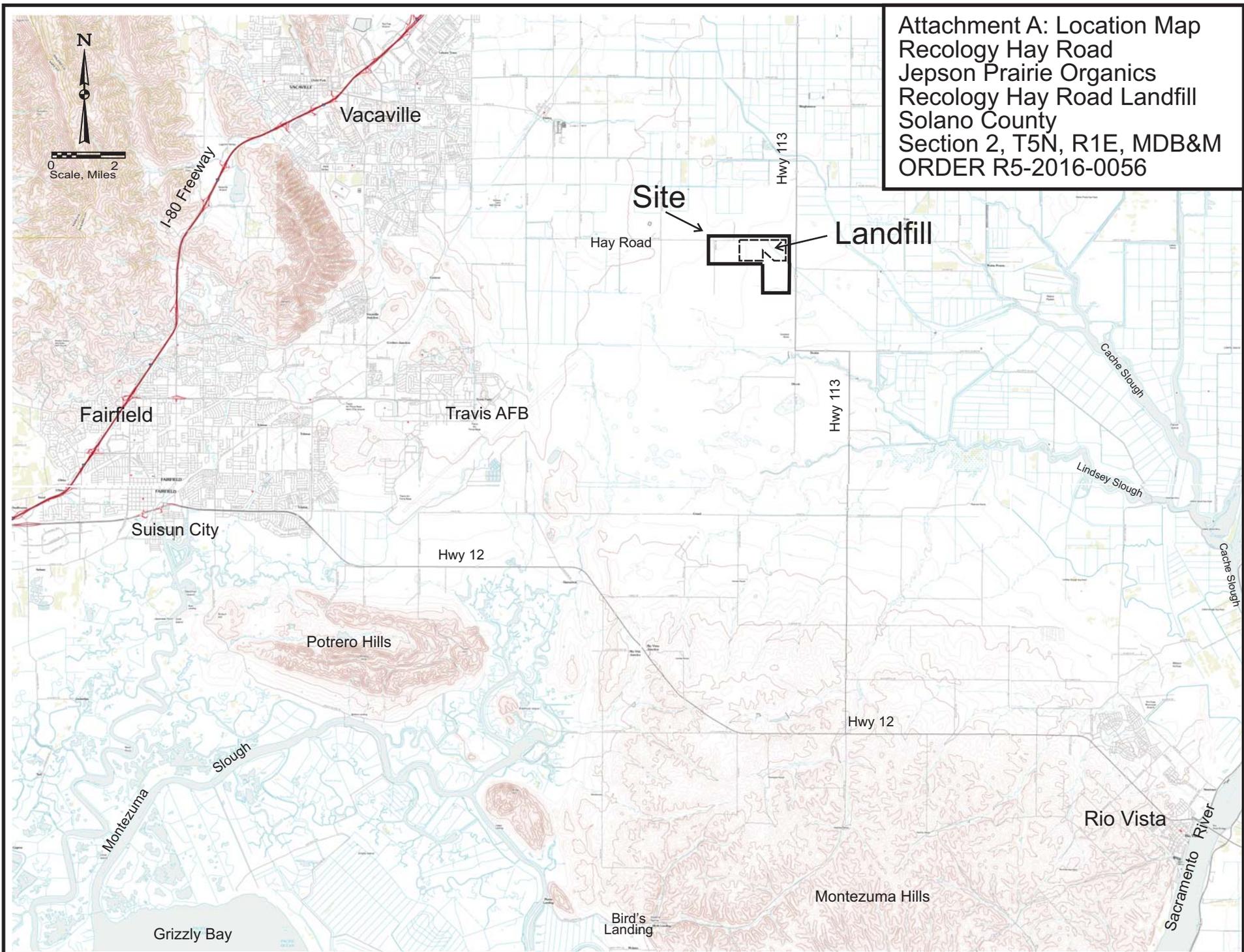
The WDRs also include requirements for the onsite waste pile (WP-9.1), land treatment unit (LTU) and composting facility. Both WP-9.1 and the LTU are required to be clean closed in accordance with an approved clean closure plan prior to construction of new landfill modules

in that area. Requirements for the composting facility are generally consistent with those under the General Composting Order.

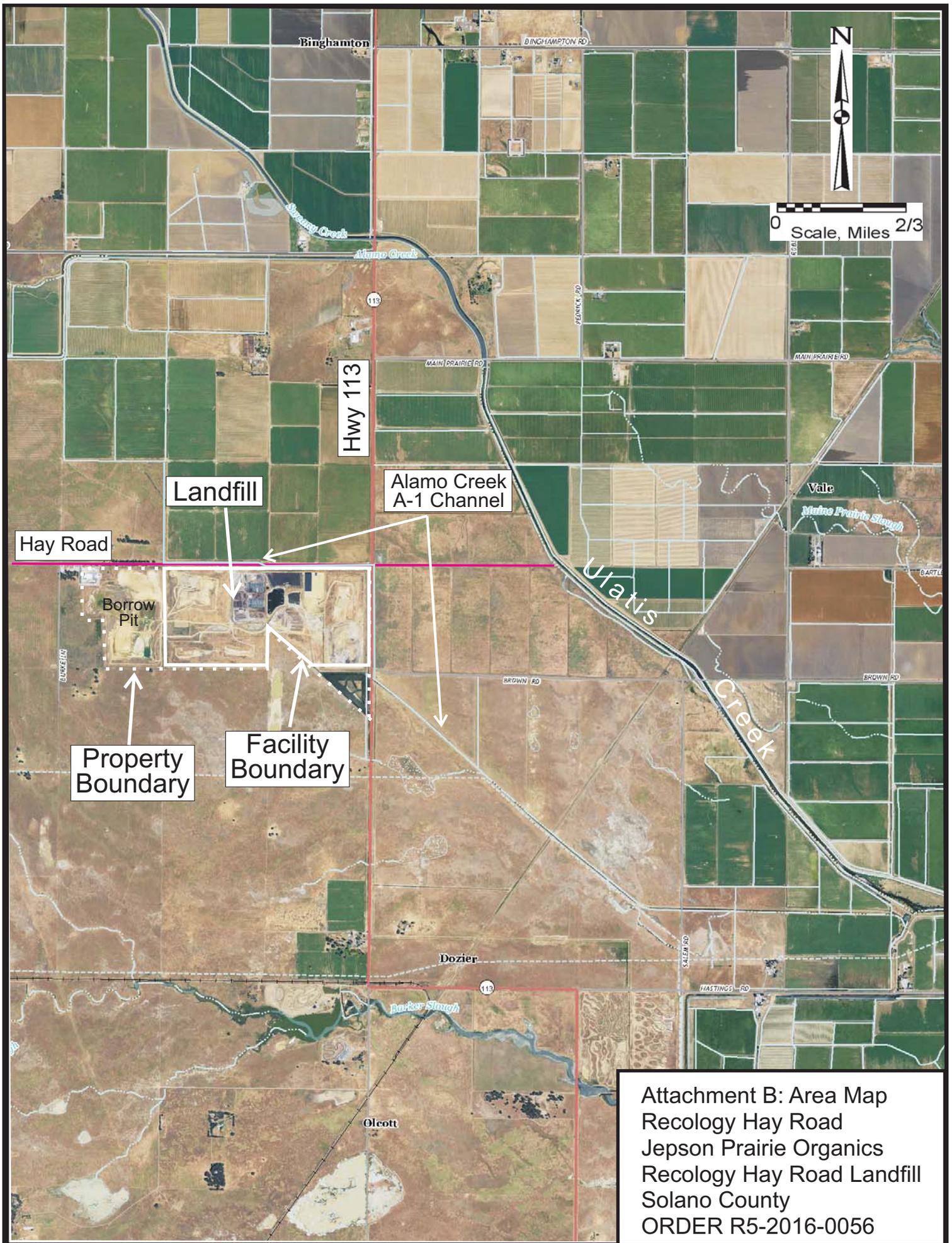
Legal Effect of Rescission of Prior WDRs or Orders on Existing Violations

Previous WDR R5-2008-0188 is rescinded by this Order. The Board's rescission of prior waste discharge requirements and/or monitoring and reporting orders does not extinguish any violations that may have occurred during the time those waste discharge requirements or orders were in effect. The Central Valley Water Board reserves the right to take enforcement actions to address violations of prior prohibitions, limitations, specifications, requirements, or provisions of rescinded waste discharge requirements or orders as allowed by law.

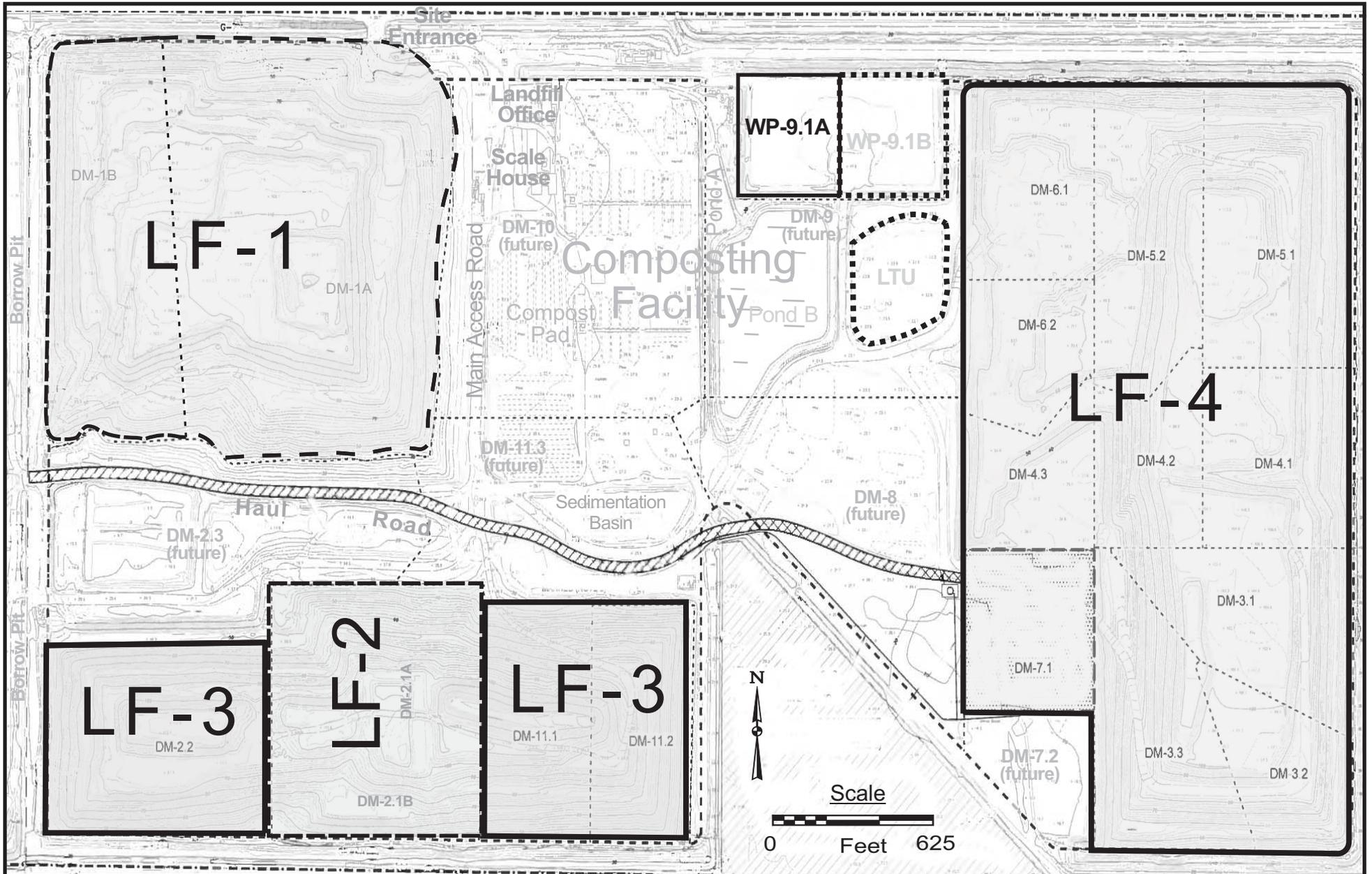
WMH



Attachment A: Location Map
Recology Hay Road
Jepson Prairie Organics
Recology Hay Road Landfill
Solano County
Section 2, T5N, R1E, MDB&M
ORDER R5-2016-0056



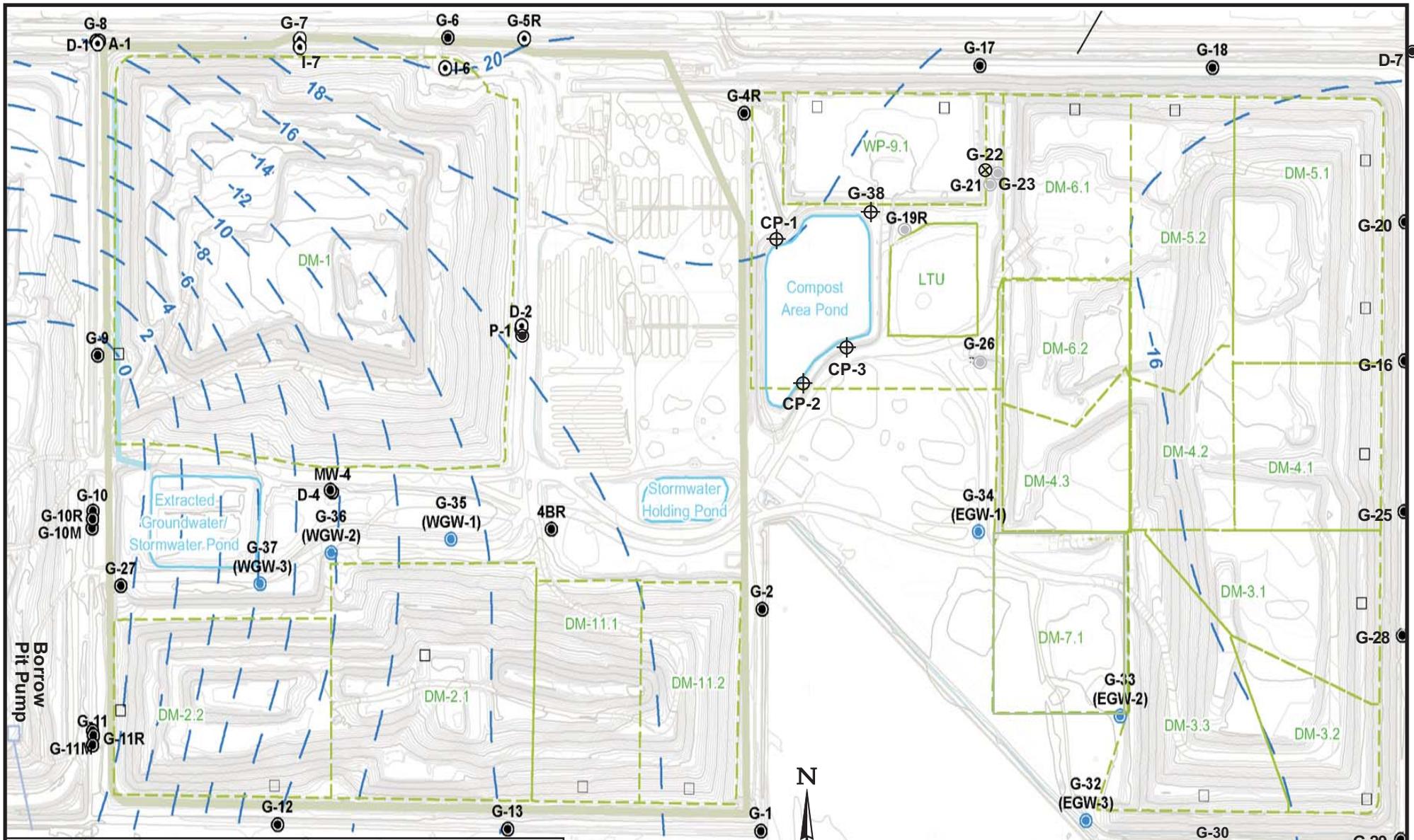
Attachment B: Area Map
Recology Hay Road
Jepson Prairie Organics
Recology Hay Road Landfill
Solano County
ORDER R5-2016-0056



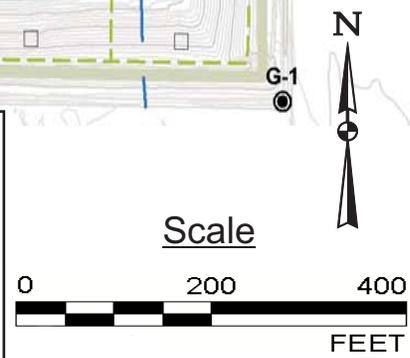
Attachment C: Facility Map
 Recology Hay Road
 Jepson Prairie Organics
 Recology Hay Road Landfill
 Solano County
 ORDER R5-2016-0056

Legend

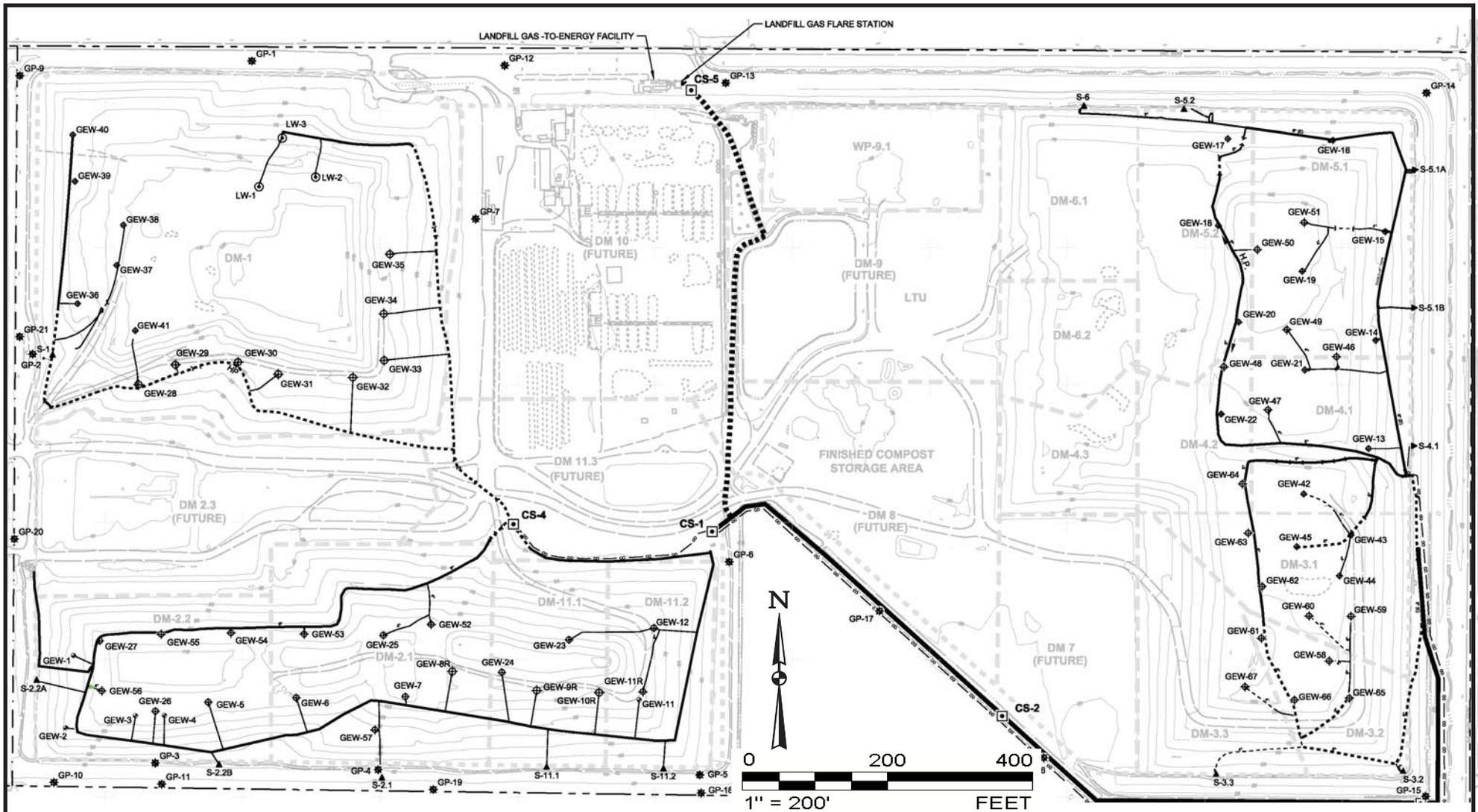
- | | | | |
|---|-------------------------|---|----------------------------------|
|  | Class II Unit Boundary |  | Unit In Process of Clean Closure |
|  | Class III Unit Boundary |  | Module/Phase Boundary |
|  | Facility Boundary | | |



Legend	
● Detection & Corrective Action Monitoring Well	⊗ GW Extraction Well
⊙ Peizometer	● Corrective Action Monitoring Well (Nitrate-N Plume)
— Slurry Wall	⊕ Proposed Monitoring Well
— GW Extraction Trench	○ Monitoring Well Planned For Abandonment
— 2Q15 GW Elevation Contour, Ft. MSL	□ LCRS Sump



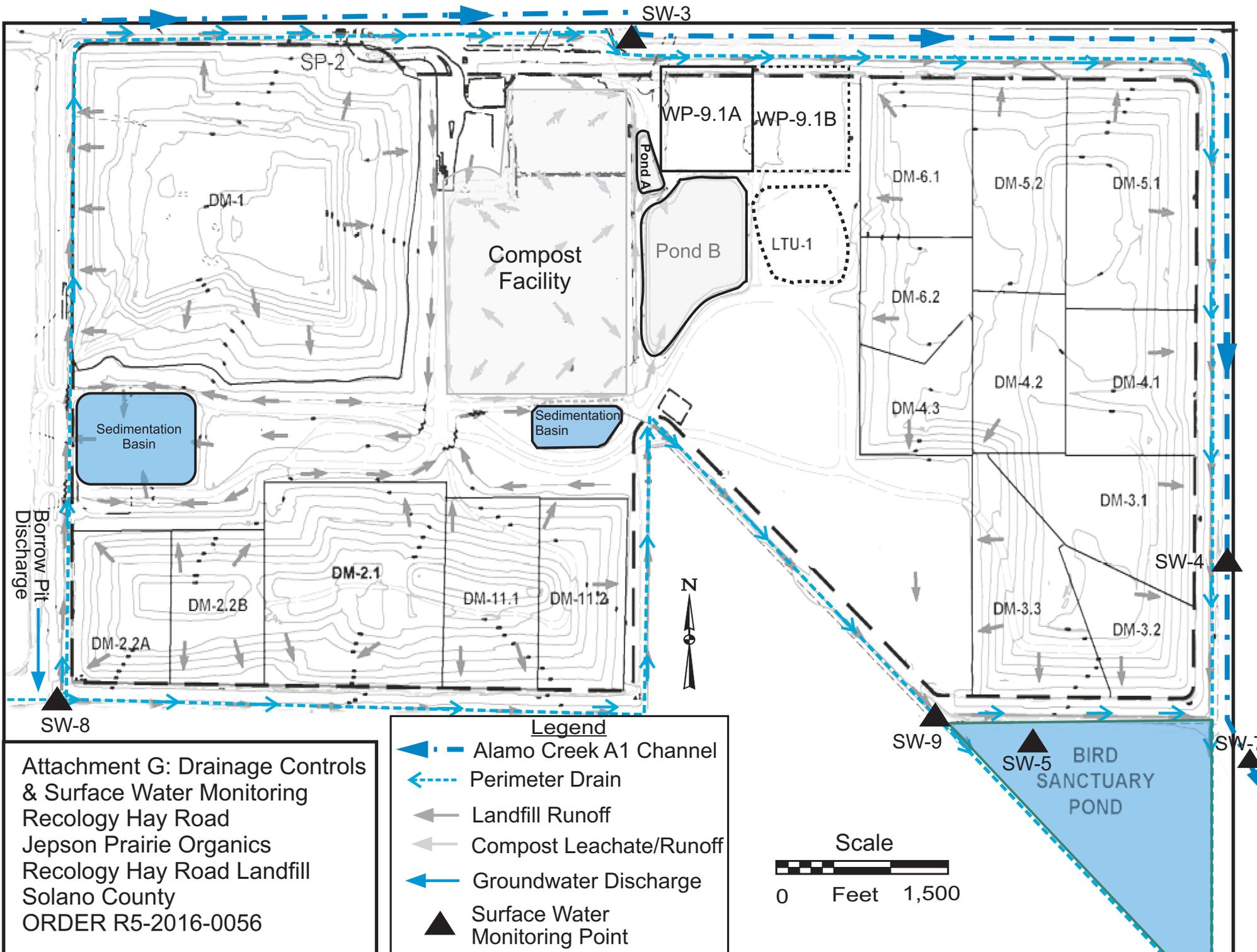
Attachment D: Groundwater Monitoring
 Recology Hay Road
 Jepson Prairie Organics
 Recology Hay Road Landfill
 Solano County
 ORDER R5-2016-0056



LEGEND

- | | | | |
|-------------|--------------------------------|---|----------------------------|
| | 4" LFG LATERAL (BELOW GROUND) | ● | CONDENSATE SUMP |
| ———— | 4" LFG LATERAL (ABOVE GROUND) | ▲ | LEACHATE SUMP |
| ----- | 6" LFG HEADER (BELOW GROUND) | ⋈ | ISOLATION VALVE |
| ———— | 6" LFG HEADER (ABOVE GROUND) | ⊕ | 2-INCH LFG EXTRACTION WELL |
| | 12" LFG LATERAL (BELOW GROUND) | ⊕ | 4-INCH LFG EXTRACTION WELL |
| ———— | 12" LFG HEADER (ABOVE GROUND) | ⊙ | LEACHATE WELL |
| — CO — CO — | AIR AND CONDENSATE PIPING | ⊛ | GAS PROBE |

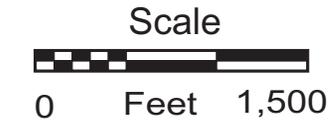
Attachment F: Gas Controls Map
 Recology Hay Road
 Jepson Prairie Organics
 Recology Hay Road Landfill
 Solano County
 ORDER R5-2016-0056

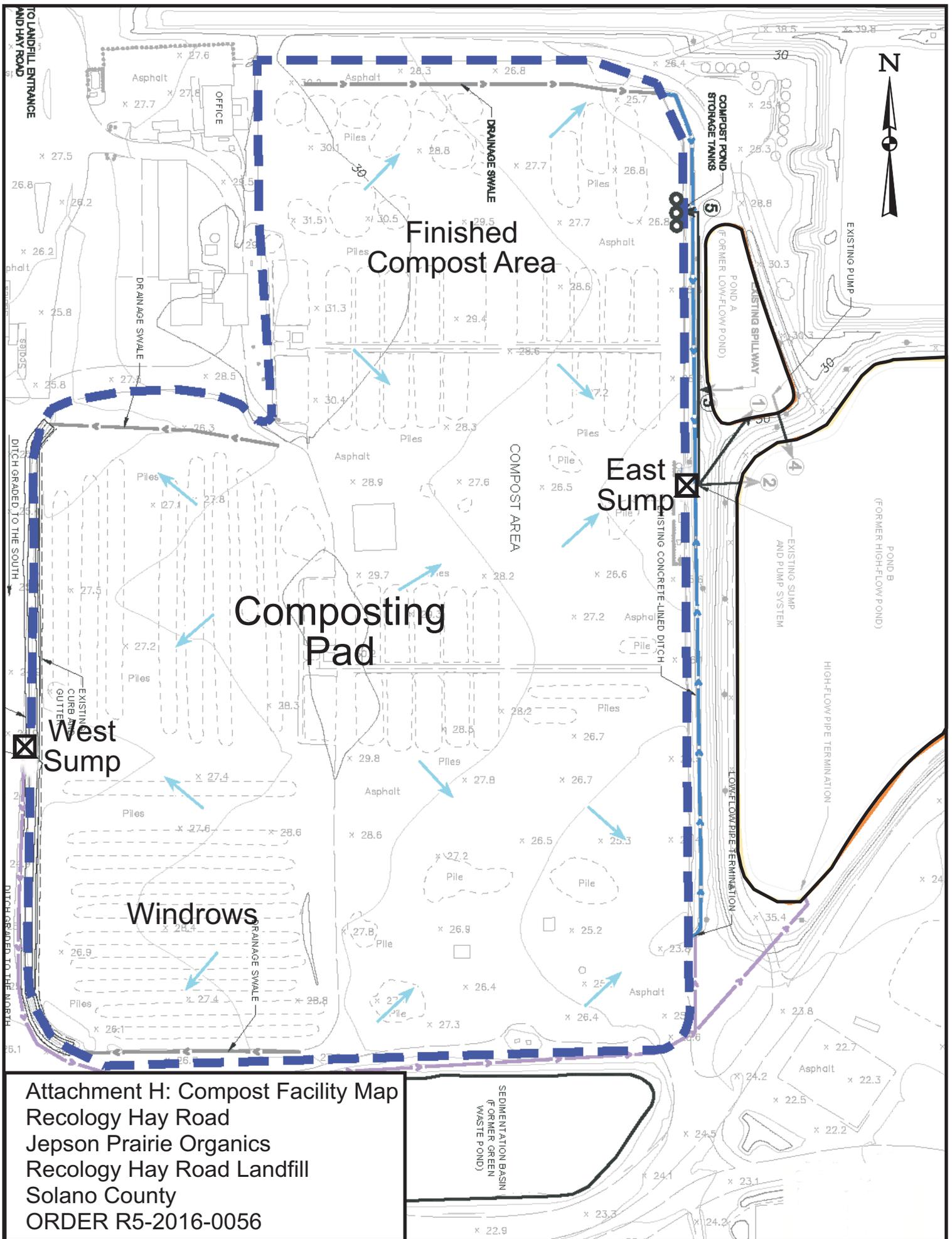


Attachment G: Drainage Controls & Surface Water Monitoring
 Recology Hay Road
 Jepson Prairie Organics
 Recology Hay Road Landfill
 Solano County
 ORDER R5-2016-0056

Legend

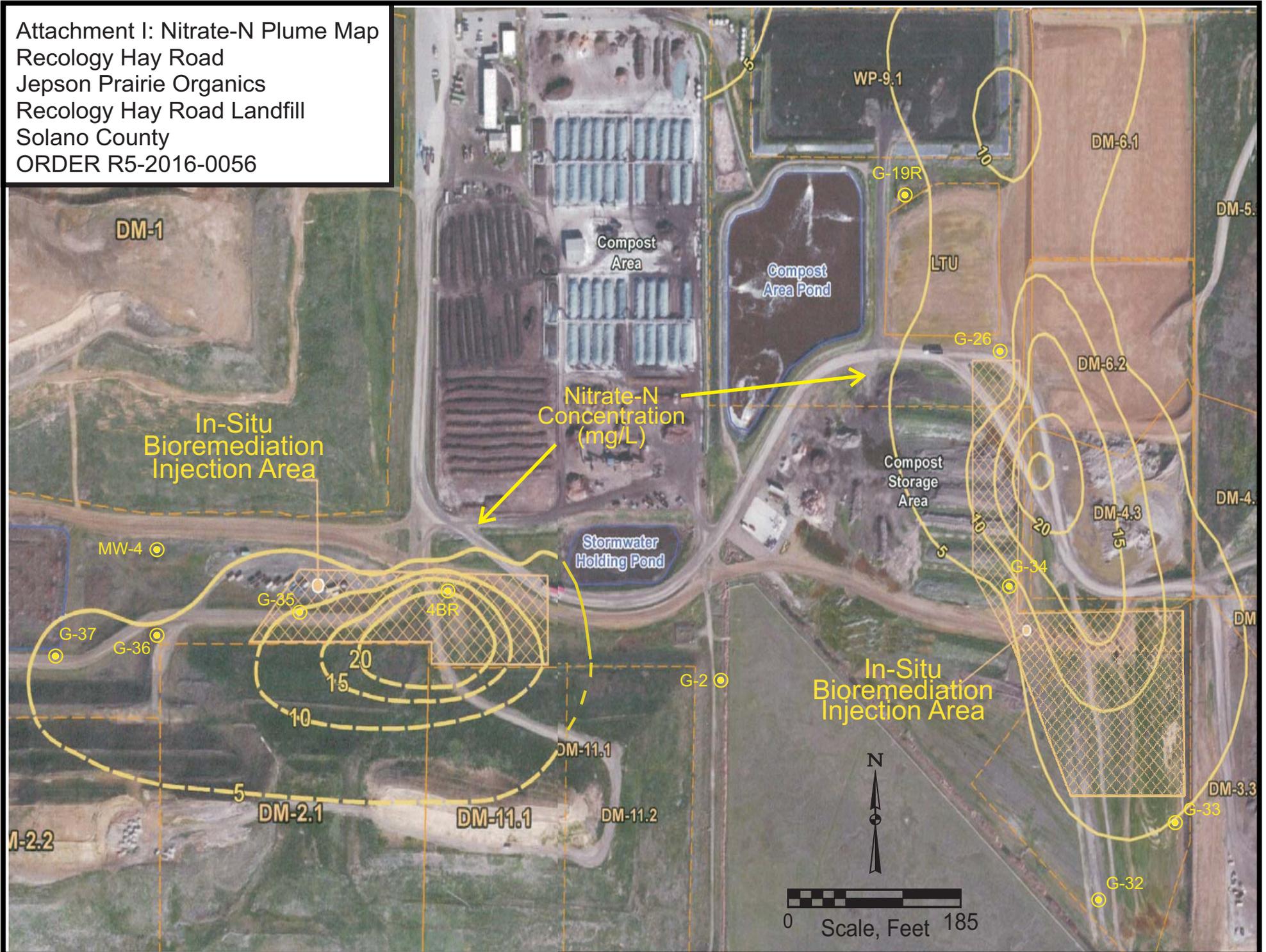
- Alamo Creek A1 Channel
- Perimeter Drain
- Landfill Runoff
- Compost Leachate/Runoff
- Groundwater Discharge
- Surface Water Monitoring Point





Attachment H: Compost Facility Map
 Recology Hay Road
 Jepson Prairie Organics
 Recology Hay Road Landfill
 Solano County
 ORDER R5-2016-0056

Attachment I: Nitrate-N Plume Map
Recology Hay Road
Jepson Prairie Organics
Recology Hay Road Landfill
Solano County
ORDER R5-2016-0056



Recology Hay Road Landfill
Waste Discharge Requirements R5-2016-0056

**TABLE 1
MAXIMUM ALLOWABLE GROUNDWATER ELEVATION
(FEET NGVD 29 / FEET NAVD 88¹ / FEET MSL)**

West Half of Site					East Half of Site				
Unit	Module	Min Req'd GW Separation (feet)	Lowest Waste Elevation ^{1,2,6}	Maximum Allowable GW Elevation at the Lowest Waste Elevation ^{1,4}	Unit	Module	Min Req'd GW Separation (feet)	Lowest Waste Elevation ^{1,2}	Maximum Allowable GW Elevation at the Lowest Waste Elevation ^{1,4}
LF-1	DM-1A	5.0	5.0 / 7.5 / 5.0	0.0 / 2.5 / 0.0	LF-4	DM-3.1	2.5	20.3 / 22.8 / 20.3	17.8 / 20.3 / 17.8
	DM-1B	5.0	5.6 / 8.1 / 5.6	0.6 / 3.1 / 0.6		DM-3.2	2.5	19.9 / 22.4 / 19.9	17.4 / 19.9 / 17.4
LF-2	DM-2.1	3.0	22.8 / 25.3 / 22.8	19.8 / 22.3 / 19.8		DM-3.3	2.5	20.9 / 23.4 / 20.9	18.4 / 20.9 / 18.4
LF-3	DM-2.2A	2.5	26.1 / 28.6 / 26.1	23.6 / 26.1 / 23.6		DM-4.1	2.5	20.4 / 22.9 / 20.4	17.9 / 20.4 / 17.9
	DM-2.2B	2.5	25.7 / 28.2 / 25.7	23.2 / 25.8 / 23.2		DM-5.1A	2.5	22.0 / 24.5 / 22.0	19.5 / 22.0 / 19.5
	DM-2.3	5.0	--- ⁵	--- ⁵		DM-5.1B	2.5	21.8 / 24.3 / 21.8	19.3 / 21.8 / 19.3
	DM-10.1	5.0	--- ⁵	--- ⁵		DM-5.2	2.5	22.0 / 24.5 / 22.0	19.5 / 22.1 / 19.5
	DM-10.2	5.0	--- ⁵	--- ⁵		DM-6	2.5	23.1 / 25.6 / 23.1	20.6 / 23.1 / 20.6
	DM-11.1	2.5	25.3 / 27.8 / 25.3	22.8 / 25.3 / 22.8		DM-7.1 ⁴	2.5	30.0 / 32.5 / 30.0	27.5 / 30.0 / 27.5
	DM-11.2	2.5	24.7 / 27.2 / 24.7	22.2 / 24.7 / 22.2		DM-7.2	2.5	--- ⁵	--- ⁵
	DM-11.3	5.0	--- ⁵	--- ⁵		DM-8.1	5.0	--- ⁵	--- ⁵
Footnotes: 1. All elevation units in feet NAVD 88 / NGVD 29 (some elevations converted from NGVD 29 datum to NAVD 88 datum using VERTCON (NGS, USACE) at http://www.ngs.noaa.gov/TOOLS/Vertcon/vertcon.html). 2. Lowest elevation of waste for lined units is primary LCRS sump or lowest waste elevation for unlined units, unless otherwise footnoted. 3. Lowest elevation of solid waste in unlined unit/module in feet NAVD 88. 4. Maximum allowable groundwater separation at the low point of the landfill module equals lowest waste elevation minus minimum required groundwater separation. Groundwater elevations may be higher at locations where the waste elevations are higher provided the minimum groundwater separation distance is maintained. 5. Future module (to be constructed per WDR construction specifications). 6. Historically, the Recology Hay Road has always surveyed elevations using the NGVD29 datum and these elevations were often referred to as "MSL" The term MSL and NGVD29 has been used interchangeably in past reports.						DM-8.2	5.0	--- ⁵	--- ⁵
						DM-9.1	5.0	--- ⁵	--- ⁵
						DM-9.2	5.0	--- ⁵	--- ⁵
					WP-9.1	WP-9.1A	2.5	25.3 / 27.8 / 25.3	22.8 / 25.3 / 22.8

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

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

December 2015

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A. APPLICABILITY

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

B. TERMS AND CONDITIONS

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

- other order or prohibition issued, reissued, or amended by the Central Valley Water Board or the State Water Board, or intentionally or negligently discharging waste, or causing or permitting waste to be deposited where it is discharged into the waters of the state and creates a condition of pollution or nuisance, is a violation of this Order and the Water Code, which can result in the imposition of civil monetary liability [Wat. Code, § 13350(a)]
2. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to [Wat. Code, § 13381]:
 - a. Violation of any term or condition contained in this Order;
 - b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;
 - c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge; or
 - d. A material change in the character, location, or volume of discharge.
 3. Before initiating a new discharge or making a material change in the character, location, or volume of an existing discharge, the Discharger shall file a new report of waste discharge (ROWD), or other appropriate joint technical document (JTD), with the Central Valley Water Board [Wat. Code, § 13260(c) and § 13264(a)]. A material change includes, but is not limited to, the following:
 - a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements;
 - b. A significant change in disposal method, location, or volume (e.g., change from land disposal to land treatment);
 - c. A change in the type of waste being accepted for disposal; or
 - d. A change to previously-approved liner systems or final cover systems that would eliminate components or reduce the engineering properties of components.
 4. Representatives of the Central Valley Water Board may inspect the facilities to ascertain compliance with the waste discharge requirements. The inspection shall be made with the consent of the owner or possessor of the facilities or, if the consent is refused, with a duly issued warrant. However, in the event of an emergency affecting the public health or safety, an inspection may be made without consent or the issuance of a warrant [Wat. Code, §13267(c)].

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

C. STANDARD PROHIBITIONS

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

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

D. STANDARD DISCHARGE SPECIFICATIONS

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

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

E. STANDARD FACILITY SPECIFICATIONS

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

10. The Discharger shall lock all groundwater monitoring wells with a lock on the well cap or monitoring well box. All monitoring devices shall be clearly labeled with their designation including all monitoring wells, LCRS risers, and lysimeter risers and shall be easily accessible for required monitoring by authorized personnel. Each monitoring device shall be clearly visible and be protected from damage by equipment or vehicles.
11. The Discharger shall ensure that methane and other landfill gases are adequately vented, removed from landfill units, or otherwise controlled to prevent the danger of adverse health effects, nuisance conditions, degradation, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.
12. The Discharger shall maintain the depth of the fluid in the sump of each landfill unit at the minimum needed for efficient pump operation (the depth at which the pump turns on given the pump intake height and maximum pump cycle frequency).
13. The depth of fluid on the landfill liner shall not exceed **30 centimeters** (cm) [40 C.F.R. § 258.40(a)(2)]. This regulation is interpreted by the Central Valley Water Board to exclude the leachate sump. The Discharger shall **immediately** notify the Central Valley Water Board staff by telephone, and follow up in writing within **seven** days if monitoring reveals that the depth of fluid on any portion of the liner (excluding the sump) exceeds 30 cm (approximately 12 inches). The written notification shall include a timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.
14. Each LCRS shall be tested at least annually to demonstrate proper operation. The results of the tests shall be compared with earlier tests made under comparable conditions [Title 27, § 20340(d)].
15. The Discharger shall maintain a *Storm Water Pollution Prevention Plan and Monitoring Program and Reporting Requirements* in accordance with State Water Board Order No. 2014-0057-DWQ (Industrial General Permit) or most recent general industrial storm water permit), or retain all storm water on-site.
16. Internal site drainage from surface or subsurface sources shall not contact or percolate through wastes.
17. New MSW landfill units or lateral expansions of existing units shall not be sited in a "wetland" [as defined in 40 C.F.R. § 232.29(r)] unless there is no practical alternative; steps have been taken to assure no net loss of wetland; the landfill unit will not degrade the wetland; the unit will not jeopardize threatened or endangered species or produce adverse modification of a critical habitat or violate any requirement of the Marine Protection, Research, and Sanctuaries Act of 1972 [40 C.F.R. § 258.12].

F. STANDARD CONSTRUCTION SPECIFICATIONS

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

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

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

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

G. STANDARD CLOSURE AND POST-CLOSURE SPECIFICATIONS

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

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

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

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

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

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

H. STANDARD FINANCIAL ASSURANCE PROVISIONS

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

I. STANDARD MONITORING SPECIFICATIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- a. **Initial Determination of Measurably Significant Evidence of a Release.** The Discharger shall compare the value reported by the laboratory for each analyte to the statistically-derived concentration limit from the most recent report (Annual Monitoring Report or Water Quality Protection Standard Report) that uses the approved statistical procedure. If the value exceeds the concentration limit for that constituent, the Discharger shall conclude that there is measurably significant evidence of a release [Title 27, § 20420(i)].

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

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

48. **Physical Evidence of a Release.** If the Discharger determines that there is a significant **physical** evidence of a release, the Discharger shall immediately

verbally notify Central Valley Water Board staff and provide written notification **by certified mail within 7 days** of such determination, and within **90 days** shall submit an amended report of waste discharge to establish an Evaluation Monitoring Program [Title 27, § 20385(a)(3) and § 20420(l)(1) & (2)].

J. RESPONSE TO A RELEASE

1. Measurably Significant Evidence of a Release Has Been Confirmed. If the Discharger has confirmed that there is measurably significant evidence of a release from a waste management unit pursuant to Standard Monitoring Specification I.46 or I.47, then the Discharger shall:
 - a. **Immediately** sample all monitoring points in the affected medium at that waste management unit and determine the concentration of all monitoring parameters and constituents of concern for comparison with established concentration limits. Because this constituent of concern scan does not involve statistical testing, the Discharger will need to collect and analyze only a single water sample from each monitoring point in the affected medium [Title 27, § 20420(k)(1)].
 - b. **Within 14 days** of confirming measurably significant evidence of a release, the Discharger shall (for releases from MSW landfill units) notify all persons who own the land or reside on the land that directly overlies any portion of the plume of contamination if contaminants have migrated off-site if indicated by sampling of detection monitoring wells [40 C.F.R. § 258.55(g)(1)(iii)].
 - c. **Within 90 days** of confirming measurably significant evidence of a release, the Discharger shall submit an amended report of waste discharge to establish an Evaluation Monitoring Program meeting the requirements of Title 27, sections 20420(k)(5)(A-D), including but not limited to the results of sampling pursuant to paragraph J.1.a, above. The Evaluation Monitoring Program shall be designed for the collection and analysis of all data necessary to assess the nature and extent of the release and to determine the spatial distribution and concentration of each constituent throughout the zone affected by the release [Title 27, § 20420(k)(5) and § 20425(b)]. For releases from MSW landfill units, the Evaluation Monitoring Program shall also include any additional proposals necessary to comply with 40 C.F.R. § 258.55, particularly the additional monitoring well required by 40 C.F.R. § 258.55(g)(1)(ii).
 - d. **Within 180 days** of confirming measurably significant evidence of a release, the Discharger shall submit to the Central Valley Water Board an initial engineering feasibility study for a Corrective Action Program necessary to meet the requirements of Title 27, section 20430. At a minimum, the initial engineering feasibility study shall contain a detailed

description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern [Title 27, § 20420(k)(6)].

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

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

K. GENERAL PROVISIONS

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

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

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

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

operator in writing of the existence of this Order. A copy of that notification shall be sent to the Central Valley Water Board.

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

L. STORM WATER PROVISIONS

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

infiltration, inundation, erosion, slope failure, washout, and overtopping under the precipitation conditions for the unit [Title 27, § 20365(a)].

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

9. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].
10. Cover materials shall be graded to divert precipitation from the waste management unit, to prevent ponding of surface water over wastes, and to resist erosion as a result of precipitation [Title 27, § 20365(f)].
11. Any drainage layer in the final cover shall be designed and constructed to intersect with the final drainage system for the waste management unit in a manner promoting free drainage from all portions of the drainage layer [Title 27, §20365(f)].

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
FOR
WASTE DISCHARGE REQUIREMENTS
FOR
INDUSTRIAL FACILITIES REGULATED BY TITLE 27
(Title 27, § 20005 et seq.)

April 2016

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A. APPLICABILITY

1. These Standard Provisions and Reporting Requirements (SPRRs) are applicable to Class II surface impoundments, waste piles, and land treatment units that are regulated by the Central Valley Regional Water Quality Control Board (hereafter, Central Valley Water Board) pursuant to the provisions of California Code of Regulations, title 27 ("Title 27"), section 20005 et seq.
2. "Order," as used throughout this document, means the Waste Discharge Requirements (WDRs) to which these SPRRs are incorporated.
3. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, and do not protect the Discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.
4. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.
5. If there is any conflicting or contradictory language between the WDRs, the Monitoring and Reporting Program (MRP), or the SPRRs, then language in the WDRs shall govern over either the MRP or the SPRRs, and language in the MRP shall govern over the SPRRs.
6. If there is a site-specific need to change a requirement in these SPRRs for a particular facility, the altered requirement shall be placed in the appropriate section of the WDRs and will supersede the corresponding SPRRs requirement. These SPRRs are standard and cannot be changed as part of the permit writing process or in response to comments, but they will be periodically updated on an as-needed basis.
7. Unless otherwise stated, all terms are as defined in Water Code section 13050 and in Title 27, section 20164.

B. TERMS AND CONDITIONS

1. Failure to comply with any waste discharge requirement, monitoring and reporting requirement, or Standard Provisions and Reporting Requirement, or other order or prohibition issued, reissued, or amended by the Central Valley Water Board or the State Water Board, or intentionally or negligently discharging waste, or causing or permitting waste to be deposited where it is discharged into the waters of the state and creates a condition of pollution or nuisance, is a violation of this Order and the Water Code, which can result in the imposition of civil monetary liability [Wat. Code, § 13350(a)]
2. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to [Wat. Code, § 13381]:

- a. Violation of any term or condition contained in this Order;
 - b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;
 - c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge; or
 - d. A material change in the character, location, or volume of discharge.
3. Before initiating a new discharge or making a material change in the character, location, or volume of an existing discharge, the Discharger shall file a new report of waste discharge (ROWD), or other appropriate joint technical document (JTD), with the Central Valley Water Board [Wat. Code, § 13260(c) and § 13264(a)]. A material change includes, but is not limited to, the following:
- a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements;
 - b. A significant change in disposal method, location, or volume (e.g., change from land disposal to land treatment);
 - c. A change in the type of waste being accepted for disposal; or
 - d. A change to previously-approved liner systems or final cover systems that would eliminate components or reduce the engineering properties of components.
4. Representatives of the Central Valley Water Board may inspect the facilities to ascertain compliance with the waste discharge requirements. The inspection shall be made with the consent of the owner or possessor of the facilities or, if the consent is refused, with a duly issued warrant. However, in the event of an emergency affecting the public health or safety, an inspection may be made without consent or the issuance of a warrant [Wat. Code, §13267(c)].
5. The Central Valley Water Board will review this Order periodically and will revise these waste discharge requirements when necessary [Wat. Code, § 13263(e) and Title 27, § 21720(b)].
6. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Central Valley Water Board [Wat. Code, § 13267(b)]. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.
7. A discharge of waste into the waters of the state is a privilege, not a right. No discharge of waste into waters of the state, whether or not the discharge is

made pursuant to waste discharge requirements, shall create a vested right to continue the discharge [Wat. Code, § 13263(g)].

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

C. STANDARD PROHIBITIONS

1. The discharge of wastes which have the potential to reduce or impair the integrity of containment structures or which, if commingled with other wastes in the waste management unit, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products, which, in turn:
 - a. require a higher level of containment than provided by the unit; or
 - b. are 'restricted wastes'; or
 - c. impair the integrity of containment structures;is prohibited [Title 27, § 20200(b)].
2. The discharge of wastes outside of a waste management unit or portions of a unit specifically designed for their containment is prohibited.
3. The discharge of waste to a closed waste management unit is prohibited.
4. The discharge of waste constituents to the unsaturated zone or to groundwater is prohibited, except within the treatment zone at a land treatment unit.
5. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.

D. STANDARD DISCHARGE SPECIFICATIONS

1. The Discharger is responsible for accurate characterization of wastes, including a determination of whether or not wastes will be compatible with containment features and other wastes at the waste management unit and whether or not the wastes are required to be managed as a hazardous waste [Title 27, § 20200(c)] or designated waste [Title 27, § 20210].
2. Leachate collected from a waste management unit shall be discharged to the unit from which it came, or discharged to an appropriate waste management unit in accordance with Title 27 and in a manner consistent with the waste classification of the liquid [Title 27, § 20200(d) and § 20340(g)].

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

E. STANDARD FACILITY SPECIFICATIONS

1. All waste management units shall be designed, constructed, and operated to ensure that wastes, including leachate, will be a minimum of 5 feet above the highest anticipated elevation of underlying groundwater [Title 27, § 20240(c)], including the capillary fringe.
2. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].
3. The Discharger shall **immediately** notify the Central Valley Water Board staff of any slope failure occurring at a waste management unit. Any failure which threatens the integrity of containment features or the waste management unit shall be promptly corrected in accordance with an approved method [Title 27, § 21710(c)(2)].
4. The Discharger shall **immediately** notify Central Valley Water Board staff of any flooding, unpermitted discharge of waste off-site or outside of waste management units, equipment failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
5. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.
6. The Discharger shall lock all groundwater monitoring wells with a lock on the well cap or monitoring well box. All monitoring devices shall be clearly labeled with their designation including all monitoring wells, LCRS risers, and lysimeter risers and shall be easily accessible for required monitoring by authorized personnel. Each monitoring device shall be clearly visible and be protected from damage by equipment or vehicles.
7. The Discharger shall maintain the depth of the fluid in the sump of each waste management unit at the minimum needed for efficient pump operation (the depth at which the pump turns on given the pump intake height and maximum pump cycle frequency).

8. Each LCRS shall be tested at least annually to demonstrate proper operation. The results of the tests shall be compared with earlier tests made under comparable conditions [Title 27, § 20340(d)].
9. The Discharger shall maintain a *Storm Water Pollution Prevention Plan and Monitoring Program and Reporting Requirements* in accordance with State Water Board Order No. 2014-0057-DWQ (or most recent general industrial storm water permit), or retain all storm water on-site.

F. STANDARD CONSTRUCTION SPECIFICATIONS

1. The Discharger shall submit for review and approval at least **90 days** prior to proposed construction, design plans and specifications for new Class II waste management units that include the following:
 - a. Detailed construction drawings showing all required liner system components, the LCRS, leachate sump, unsaturated zone monitoring system, and access to the LCRS for required annual testing.
 - b. A Construction Quality Assurance (CQA) Plan prepared by a California-registered civil engineer or certified engineering geologist, and that meets the requirements of Title 27, section 20324.
 - c. A geotechnical evaluation of the area soils, evaluating their use as the base layer or reference to the location of this information in the ROWD/JTD [Title 27, § 21750(f)(4)].
 - d. Information about the seismic design of the proposed new waste management unit (or reference to the location of this information in the ROWD/JTD) in accordance with Title 27, section 20370.
 - e. A revised water quality monitoring plan for groundwater detection monitoring (or information showing the existing plan is adequate) in accordance with Title 27, section 20415.
 - f. An Operation Plan (or reference to the location of this information in the ROWD/JTD) meeting the requirements of Title 27, sections 21760(b) and 20375(b).
2. All containment structures shall be designed by, and construction shall be supervised by, a California registered civil engineer or a certified engineering geologist, and shall be certified by that individual as meeting the prescriptive standards, or approved engineered alternative design, in accordance with this Order prior to waste discharge.
3. The Discharger shall not proceed with construction until the construction plans, specifications, and all applicable construction quality assurance plans have

been approved. Waste management units shall receive a final inspection and approval of the construction by Central Valley Water Board staff before use of the unit commences [Title 27, § 20310(e)].

4. Any report, or any amendment or revision of a report, that proposes a design or design change that might affect a waste management unit's containment features or monitoring systems shall be approved by a California registered civil engineer or a certified engineering geologist [Title 27, § 21710(d)].
5. Materials used in containment structures shall have appropriate chemical and physical properties to ensure that such structures do not fail to contain waste because of pressure gradients, physical contact with waste or leachate, chemical reactions with soil or rock, climatic conditions, the stress of installation, or because of the stress of daily operations [Title 27, § 20320(a)].
6. Waste management units and their respective containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping [Title 27, § 20365(a)].
7. The Discharger shall design storm water conveyance systems for Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].
8. All Class II waste management units shall be designed to withstand maximum credible earthquake without damage to the foundation or to the structures that control leachate, or surface drainage, or erosion [Title 27, § 20370(a)].
9. The Discharger shall perform stability analyses that include components to demonstrate the integrity of the waste management unit foundation, final slopes, and containment systems under both static and dynamic conditions throughout the life of the unit [Title 27, § 21750(f)(5)].
10. New Class II Units, other than LTUs and expansions of existing Class II units, shall have a 200 foot setback from any known Holocene fault. [Title 27, § 20250(d)].
11. Liners shall be designed and constructed to contain the fluid, including waste, and leachate [Title 27, § 20330(a)].
12. Hydraulic conductivities shall be determined primarily by appropriate field test methods in accordance with accepted civil engineering practice. The results of laboratory tests with both water and leachate, and field tests with water, shall be compared to evaluate how the field permeabilities will be affected by leachate. It is acceptable for the Discharger to use appropriate compaction tests in conjunction with laboratory hydraulic conductivity tests to determine field permeabilities as long as a reasonable number of field hydraulic conductivity tests are also conducted [Title 27, § 20320(c)].

13. Hydraulic conductivities specified for containment structures other than the final cover shall be relative to the fluids (leachate) to be contained. Hydraulic conductivities for the final cover shall be relative to water [Title 27, § 20320(b)].
14. A test pad for each barrier layer and any final cover shall be constructed in a manner duplicating the field construction. Test pad construction methods, with the designated equipment, shall be used to determine if the specified density/moisture-content/hydraulic conductivity relationships determined in the laboratory can be achieved in the field with the compaction equipment to be used and at the specified lift thickness [Title 27, § 20324(g)(1)(A)].
15. The Discharger shall ensure proper preparation of the subgrade for any liner system that includes a GCL so as to provide a smooth surface that is free from rocks, sticks, or other debris that could damage or otherwise limit the performance of the GCL.
16. The Discharger shall propose an electronic leak location survey of the top liner for any new waste management unit in the construction quality assurance plan unless the Discharger demonstrates that a leak location survey is not needed.
17. Leachate collection and removal systems are required for Class II surface impoundments [Title 27, § 20340(a)].
18. The LCRS shall be designed, constructed, maintained, and operated to collect and remove twice the maximum anticipated daily volume of leachate from the waste management unit [Title 27, § 20340(b)].
19. Leachate collection and removal systems shall be designed and operated to function without clogging through the life of the waste management unit.
20. The leachate sump, leachate removal pump, and pump controls shall be designed and set to maintain a fluid depth no greater than the minimum needed for efficient pump operation [Title 27, § 20340(c)].
21. All construction of liner systems and final cover systems shall be performed in accordance with a Construction Quality Assurance Plan certified by a registered civil engineer or a certified engineering geologist [Title 27, § 20323].
22. The Construction Quality Assurance program shall be supervised by a registered civil engineer or a certified engineering geologist who shall be designated the CQA officer [Title 27, § 20324(b)(2)].
23. The Discharger shall ensure that a third party independent of both the Discharger and the construction contractor performs all of the construction quality assurance monitoring and testing during the construction of a liner system.

24. The Discharger shall notify Central Valley Water Board staff at least **14 days** prior to commencing field construction activities including construction of a new Class II waste management unit, construction of a final cover (for units closed as a landfill), or any other construction that requires Central Valley Water Board staff approval under this Order.
25. The Discharger shall submit for review and approval at least **60 days** prior to proposed discharge, final documentation required in Title 27 Section 20324(d)(1)(C) following the completion of construction of a new Class II waste management unit. The report shall be certified by a registered civil engineer or a certified engineering geologist and include a statement that the liner system was constructed in accordance with the approved design plans and specifications, the CQA Plan, the requirements of the WDRs, and that it meets the performance goals of Title 27. The report shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, the construction quality assurance plan, and the performance goals of Title 27.
26. The Discharger shall not discharge waste onto a newly constructed liner system until the final documentation report has been reviewed and an acceptance letter has been received.

G. STANDARD CLOSURE AND POST-CLOSURE SPECIFICATIONS

1. The final closure and post-closure maintenance plan for the waste management unit shall include at least the following: an itemized cost analysis, closure schedule, any proposed final treatment procedures, map, changes to the unit description presented in the most recent ROWD, future land use, and a construction quality assurance plan [Title 27, § 21769(c) & (d)].
2. Closure of each waste management unit shall be under the direct supervision of a registered civil engineer or certified engineering geologist [Title 27, § 20950(b)].
3. The final cover of waste management units closed as a landfill shall be designed, graded, and maintained to prevent ponding and soil erosion due to high run-off velocities [Title 27, § 21090(b)(1)(A)].
4. The final grading design shall be designed and approved by a registered civil engineer or certified engineering geologist [Title 27, § 21090(b)(1)(C)].
5. All final cover designs shall include a minimum 1-foot thick erosion resistant vegetative layer or a mechanically erosion-resistant layer [Title 27, § 21090(a)(3)(A)(1 & 2)].

6. Areas with slopes greater than ten percent, surface drainage courses, and areas subject to erosion by wind or water shall be designed and constructed to prevent such erosion [Title 27, § 21090(b)(2)].
7. The Discharger shall design storm water conveyance systems for Class II units that are closed as a landfill for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].
8. Construction or repair of a final cover system's low-hydraulic conductivity layer is to be carried out in accordance with an approved construction quality assurance plan [Title 27, § 21090(b)(1)(E)].
9. Within **30 days** of completion of all closure activities, the Discharger shall certify that all closure activities were performed in accordance with the most recently approved final closure plan and CQA Plan, and in accordance with all applicable regulations. The Discharger shall also certify that units that are closed as a landfill shall be maintained in accordance with an approved post-closure maintenance plan [Title 27, § 21710(c)(6)].
10. The post-closure maintenance period for units closed as a landfill shall continue until the Central Valley Water Board determines that wastes remaining in the landfill unit(s) no longer pose a threat to water quality [Title 27, § 20950(a)(1)].
11. The Discharger shall periodically inspect and identify problems with the final cover including areas that require replanting, erosion, areas lacking free drainage, and any areas damaged by equipment operations [Title 27, § 21090(a)(4)(B)].
12. The Discharger shall repair any cover promptly in accordance with a cover repair plan to be included in the final post-closure maintenance plan [Title 27, § 21090(a)(4)(C)].

H. STANDARD FINANCIAL ASSURANCE PROVISIONS

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

I. STANDARD MONITORING SPECIFICATIONS

1. The water quality monitoring program shall include appropriate and consistent sampling and analytical procedures and methods designed to ensure that

monitoring results provide a reliable indication of water quality at all monitoring points and background monitoring points [Title 27, § 20415(e)(4)].

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

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

8. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless a longer time period is approved, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) Methods for the Analysis of Organics in Water and Wastewater (USEPA 600 Series), (2) Test Methods for Evaluating Solid Waste (SW-846, latest edition), and (3) Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan. Appropriate sample preparation techniques shall be used to minimize matrix interferences.
9. If methods other than USEPA-approved methods or Standard Methods are used, or there is a proposed alternant USEPA method than the one listed in the MRP, the proposed methodology shall be submitted for review and approval prior to use, including information showing its equivalence to the required method.
10. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., "trace" or "ND") in data from background monitoring points for that medium, the analytical method having the lowest MDL shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
11. The laboratory reporting limit (RL) for all reported monitoring data shall be set no greater than the practical quantitation limit (PQL).
12. **"Trace" results** - results falling between the MDL and the PQL - shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run.
13. Laboratory data shall not be altered or revised by the Discharger. If the Discharger observes potential lab errors, it shall identify the issue in the monitoring report and shall describe steps that will be taken to prevent similar errors in the future.
14. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively

interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs. MDLs and PQLs shall be reported.

15. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged in the laboratory report accordingly, along with estimates of the detection limit and quantitation limit actually achieved. **The MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result.** The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.
16. All **QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and signature of a responsible person from the laboratory. **Sample results shall be reported unadjusted for blank results or spike recoveries.** In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged, but the analytical results shall not be adjusted.
17. Unknown chromatographic peaks shall be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.
18. The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative groundwater samples [Title 27, § 20415(b)(4)(B)].
19. All borings are to be logged during drilling under the direct supervision of a registered geologist or registered civil engineer with expertise in stratigraphic well logging [Title 27, § 20415(e)(2)].
20. Soils are to be described according to the Unified Soil Classification System [Title 27, § 20415(e)(2)(A)]. Rock is to be described in a manner appropriate for the purpose of the investigation [Title 27, § 20415(e)(2)(B)].

21. The Discharger shall submit a work plan for review and approval at least **60 days** prior to installation or abandonment of groundwater monitoring wells.
22. The Discharger shall provide Central Valley Water Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation or abandonment of monitoring devices.
23. The water quality protection standard shall consist of the constituents of concern (COC), concentration limits, and the point of compliance. The water quality protection standard shall apply during the active life of the waste management unit, closure period, post-closure maintenance period, and any compliance period under Title 27, section 20410 [Title 27, § 20390].
24. The point of compliance at which the water quality protection standard applies is a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit [Title 27, § 20405).
25. The compliance period is the minimum period of time during which the Discharger shall conduct a water quality monitoring program and is the number of years equal to the active life of the waste management unit plus the closure period [Title 27, § 20410(a)].
26. The groundwater monitoring system shall include a sufficient number of monitoring points, installed at appropriate locations, to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater that has not been affected by a release from the waste management unit [Title 27, § 20415(b)(1)(A)].
27. The Detection Monitoring Program shall include a sufficient number of monitoring points, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the point of compliance to allow the detection of a release from the waste management unit [Title 27, § 20415(b)(1)(B)1.].
28. Additional monitoring points shall be added as necessary to provide the best assurance of the **earliest possible detection** of a release from the waste management unit [Title 27, § 20415(b)(1)(B)2.].
29. The Detection Monitoring Program shall also include a sufficient number of monitoring points installed at appropriate depths and locations to yield groundwater samples from other aquifers or perched zones not already monitored to provide the **earliest possible detection** of a release from the waste management unit [Title 27, § 20415(b)(1)(B)3. and 4., and §20420(b)].

30. A surface water monitoring system shall be established to monitor each surface water body that could be affected by a release from the waste management unit [Title 27, § 20415(c)].
31. An unsaturated zone monitoring system shall be established for each waste management unit [Title 27, § 20415(d)].
32. The Discharger shall notify Central Valley Water Board staff within **seven days** if fluid is detected in a previously dry LCRS, unsaturated zone monitoring system, or if a progressive increase is detected in the volume of fluid in a LCRS [Title 27, § 21710(c)(3)].
33. Driller's logs for all monitoring wells shall to be submitted to the Central Valley Water Board and the Department of Water Resources [Wat. Code, § 13751 and Title 27, § 20415(b)(3)].
34. Groundwater elevation, temperature, electrical conductivity, turbidity, and pH are to be accurately measured at each well each time groundwater is sampled [Title 27, § 20415(e)(13)].
35. The groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation being monitored shall be determined at least quarterly [Title 27, § 20415(e)(15)].
36. The Discharger shall graph all analytical data from each monitoring point and background monitoring point and shall submit the graphs to the Central Valley Water Board annually [Title 27, § 20415(e)(14)].
37. For each waste management unit, the Discharger shall collect all data necessary for selecting appropriate data analysis methods for establishing background values for each constituent of concern and for each monitoring parameter [Title 27, § 20420(c)]. The Discharger shall propose a data analysis method that includes a detailed description of the criteria to be used for determining "measurably significant" (as defined in Title 27, section 20164) evidence of a release from the waste management unit and determining compliance with the water quality protection standard [Title 27, § 20415(e)(6) and (7)].
38. For statistical analysis of data, the Discharger shall use one of the methods described in Title 27, section 20415(e)(8)(A)-(E). A non-statistical data analysis method can be used if the method can achieve the goal of the particular monitoring program at least as well as the most appropriate statistical method [Title 27, § 20415(e)(8)]. The Discharger shall use a statistical or nonstatistical data analysis method that complies with Title 27, section 20415(e)(7, 8, 9, and 10), to compare the concentration of each constituent of concern or monitoring parameter with its respective background concentration to determine whether

there has been a measurably significant evidence of a release from the waste management unit. For any given monitoring point at which a given constituent has already exhibited a measurably significant indication of a release at that monitoring point, the Discharger may propose to monitor the constituent, at that well, using a concentration-versus-time plot.

39. The Discharger may propose an alternate statistical method [to the methods listed under Title 27, section 20415(e)(8)(A-D)] in accordance with Title 27, section 20415(e)(8)(E), for review and approval.
40. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Title 27, section 20415(e)(7) that is used in the statistical method shall be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the WDRs or an approved Sample Collection and Analysis Plan for routine laboratory operating conditions that are available to the facility. The Discharger's technical report (Sample Collection and Analysis Plan and/or Water Quality Protection Standard Report), pursuant to Title 27, section 20415(e)(7), shall consider the PQLs listed in Appendix IX, Article 19 to Chapter 14 of Division 4.5 of Title 22, CCR, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or non-statistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties".
41. The water quality protection standard for organic compounds which are not naturally occurring and not detected in background groundwater samples shall be taken as the detection limit of the analytical method used (e.g., USEPA methods 8260 and 8270).
42. Alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate) if part of an approved water quality protection standard. Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Central Valley Water Board staff.
43. **Confirmation of Measurably Significant Evidence of a Release.** Whenever a constituent is detected at a detection monitoring point at a concentration that exceeds the concentration limit from the water quality protection standard, the

Discharger shall conduct verification sampling to confirm if the exceedance is due to a release or if it is a false-positive (unless previous monitoring has already confirmed a release for that constituent at that monitoring point). An exceedance of the concentration limit from the water quality protection standard is considered measurably significant evidence of a release that must be either confirmed or denied. There are two separate verification testing procedures:

- a. Standard Monitoring Specification I.44 provides the procedure for analytes that are detected in less than 10% of the background samples such as non-naturally occurring constituents like volatile organic compounds; and
- b. Standard Monitoring Specification I.45 provides the procedure for analytes that are detected in 10% or greater of the background samples such as naturally occurring constituents like chloride.

44. Verification Procedure for Analytes Detected in Less than 10% of Background Samples.

The Discharger shall use the following non-statistical method for all analytes that are detected in less than 10% of the background samples. The non-statistical method shall be implemented as follows:

- a. **Initial Determination of Measurably Significant Evidence of a Release.** Identify each analyte in the **current** detection monitoring point sample that exceeds either its respective MDL or PQL, and for which a release has not been previously confirmed. The Discharger shall conclude that the exceedance provides a preliminary indication of a release or a change in the nature or extent of the release, at that monitoring point, if **either**:
 - 1) The data contains two or more analytes that equal or exceed their respective MDLs; or
 - 2) The data contains one or more analyte that equals or exceeds its PQL.
- b. **Discrete Retest** [Title 27, § 20415(e)(8)(E) and § 20420(j)(1-3)]:
 - 1) In the event that the Discharger or Central Valley Water Board staff concludes (pursuant to paragraph I.44.a., above) that there is a preliminary indication of a release, then the Discharger shall **immediately** notify Central Valley Water Board staff by phone or e-mail and, within **30 days** of such indication, shall collect two new (retest) samples from the monitoring point where the release is preliminarily indicated and analyze them for the constituents that caused the need for the retest.
 - 2) **Confirmation of a Release.** As soon as the retest data are available, the Discharger shall conclude that measurably significant evidence of a release is confirmed if (not including the original sample) two or more

analytes equal or exceed their respective MDLs or if one or more analyte equals or exceeds its PQL. The Discharger shall then:

- a) **Immediately** verbally notify the Central Valley Water Board whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of the verbal notification; and
- b) Carry out the requirements of Section J, **RESPONSE TO A RELEASE** if a release has been confirmed.
- c) Add any five-year analyte that is confirmed per this method to the monitoring parameter list such that it is monitored during each regular monitoring event.

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

- a. **Initial Determination of Measurably Significant Evidence of a Release.**
The Discharger shall compare the value reported by the laboratory for each analyte to the statistically-derived concentration limit from the most recent report (Annual Monitoring Report or Water Quality Protection Standard Report) that uses the approved statistical procedure. If the value exceeds the concentration limit for that constituent, the Discharger shall conclude that there is measurably significant evidence of a release [Title 27, § 20420(i)].
- b. **Retest Method** [Title 27, § 20415(e)(8)(E) and § 20420(j)(1-3)].
 - 1) In the event that the Discharger or Central Valley Water Board staff concludes (pursuant to paragraph I.45.a., above) that there is a preliminary indication of a release, then the Discharger shall **immediately** notify Central Valley Water Board staff by phone or e-mail and, within **30 days** [Title 27, § 20415(e)(8)(E)(3)] of such indication, the Discharger shall implement a verification procedure/retest option, in accordance with Title 27, sections 20415(e)(8)(E) and 20420(j)(2). The verification procedure shall include either a single “composite” retest (i.e., a statistical analysis that augments and reanalyzes the data from the monitoring point that indicated a release) or shall consist of at least two “discrete” retests

(i.e., statistical analyses each of which analyzes only newly-acquired data from the monitoring point that indicated a release) [Title 27, § 20415(e)(8)(E)]. The Discharger may use an alternate method previously approved by the Central Valley Water Board and included in the Monitoring and Reporting Program. The verification procedure shall comply with the requirements of Title 27, section 20415(e)(8)(E) in addition to the performance standards of Title 27, section 20415(e)(9). The retest samples shall be collected from the monitoring point where the release is preliminarily indicated and shall be analyzed for the constituents that caused the need for the retest. For any indicated monitoring parameter or constituent of concern, if the retest results of one or more of the retest data suites confirm the original indication, the Discharger shall conclude that measurably significant evidence of a release has been confirmed.

- 2) **Confirmation of a Release.** As soon as the retest data are available, the Discharger shall evaluate the results pursuant to paragraph I.45.b.1, above and shall:
 - a) **Immediately** verbally notify the Central Valley Water Board whether or not the retest confirmed measurably significant evidence of a release for the analyte at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of the verbal notification; and
 - b) Carry out the requirements of Section J, **RESPONSE TO A RELEASE** if a release has been confirmed.
 - c) Add any five-year analyte that is confirmed per this method to the monitoring parameter list such that it is monitored during each regular monitoring event.

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

J. RESPONSE TO A RELEASE

1. **Measurably Significant Evidence of a Release Has Been Confirmed.** If the Discharger has confirmed that there is measurably significant evidence of a release from a waste management unit pursuant to Standard Monitoring Specification I.44 or I.45, then the Discharger shall:
 - a. **Immediately** sample all monitoring points in the affected medium at that waste management unit and determine the concentration of all monitoring parameters and constituents of concern for comparison with established concentration limits. Because this constituent of concern scan does not involve statistical testing, the Discharger will need to collect and analyze only a single water sample from each monitoring point in the affected medium [Title 27, § 20420(k)(1)].
 - b. **Within 90 days** of confirming measurably significant evidence of a release, the Discharger shall submit an amended report of waste discharge to establish an Evaluation Monitoring Program meeting the requirements of Title 27, sections 20420(k)(5)(A-D), including but not limited to the results of sampling pursuant to paragraph J.1.a, above. The Evaluation Monitoring Program shall be designed for the collection and analysis of all data necessary to assess the nature and extent of the release and to determine the spatial distribution and concentration of each constituent throughout the zone affected by the release [Title 27, § 20420(k)(5) and § 20425(b)].
 - c. **Within 180 days** of confirming measurably significant evidence of a release, the Discharger shall submit to the Central Valley Water Board an initial engineering feasibility study for a Corrective Action Program necessary to meet the requirements of Title 27, section 20430. At a minimum, the initial engineering feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern [Title 27, § 20420(k)(6)].
 - d. If the Discharger confirms that there is measurably significant evidence of a release from the waste management unit at any monitoring point, the Discharger may attempt to demonstrate that a source other than the waste management unit caused the evidence of a release or that the evidence is an artifact caused by an error in sampling, analysis, or statistical evaluation or by natural variation in groundwater, surface water, or the unsaturated zone. The Discharger may make a demonstration pursuant to Title 27, section 20420(k)(7) in addition to or in lieu of submitting both an amended report of waste discharge or an engineering feasibility study; however, the Discharger is not relieved of the requirements and due dates of Title 27, sections 20420(k)(6) & (7) unless Central Valley Water Board staff agree that the demonstration successfully shows that a source other than the

waste management unit caused the evidence of a release or that the evidence resulted from error in sampling, analysis, or statistical evaluation or from natural variation in groundwater, surface water, or the unsaturated zone. In order to make this demonstration, the Discharger shall notify the Central Valley Water Board by certified mail of the intent to make the demonstration **within seven days** of determining measurably significant evidence of a release, and shall submit a report **within 90 days** of determining measurably significant evidence of a release [Title 27, § 20420(k)(7)].

- e. **Within 90 days** of the date that the Evaluation Monitoring Program from paragraph J.1.b is approved (the date is it established), the Discharger shall complete and submit the following:
 - i) **Results and Assessment for the Evaluation Monitoring Program.** A report with the results and assessment based on the approved Evaluation Monitoring Program [Title 27, § 20425(b)].
 - ii) **Updated Engineering Feasibility Study.** An updated engineering feasibility study for corrective action based on the data collected to delineate the release and data from the ongoing monitoring program required under Title 27, section 20425(e) [Title 27, § 20425(c)].
 - iii) **Amended ROWD for a Corrective Action Program.** An amended report of waste discharge to establish a Corrective Action Program meeting the requirements of Title 27, section 20430 based on the data collected to delineate the release and based on the updated engineering feasibility study [Title 27, § 20425(d)].

K. GENERAL PROVISIONS

1. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Central Valley Water Board office by telephone **as soon as** it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.
2. All reports and transmittal letters shall be signed by persons identified below:
 - a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor.

- c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
 - d. A duly authorized representative of a person designated in a, b or c above if:
 - 1) The authorization is made in writing by a person described in a, b, or c of this provision;
 - 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility (a duly authorized representative may thus be either a named individual or any individual occupying a named position); and
 - 3) The written authorization is submitted to the Central Valley Water Board.
 - e. Any person signing a document under this Section shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”
3. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.
 4. The owner of the waste management facility shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and leachate generated by discharged waste during the active life, closure, and any post-closure maintenance period of the waste management units and during subsequent use of the property for other purposes.
 5. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of this Order.
 6. The Discharger shall notify the Central Valley Water Board of a material change in; the types, quantity, or concentrations of wastes discharged; site operations and features; or proposed closure procedures, including changes in cost

estimates. This notification shall be given a reasonable time before the changes are made or become effective. No changes shall be made without Central Valley Water Board approval following authorization for closure pursuant to the site Notification of Closure [Title 27, § 21710(a)(4)].

7. The Discharger shall maintain legible records of the volume and type of each waste discharged at each waste management unit or portion of a unit, and the manner and location of discharge. Such records shall be maintained by the Discharger until the beginning of the post-closure maintenance period. These records shall be on forms approved by the State Water Board or Central Valley Water Board and shall be maintained at the waste management facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the State Water Board or Central Valley Water Board at any time during normal business hours. At the beginning of the post-closure maintenance period, copies of these records shall be sent to the Central Valley Water Board [Title 27, § 21720(f)].
8. In the event of any change in landowner or the operator of the waste management facility, the Discharger shall notify the succeeding owner or operator in writing of the existence of this Order. A copy of that notification shall be sent to the Central Valley Water Board.
9. In the event of any change of ownership or responsibility for construction, operation, closure, or post-closure maintenance of the waste discharge facilities described in this Order, the Discharger shall notify the Central Valley Water Board prior to the effective date of the change and shall include a statement by the new Discharger that construction, operation, closure, or post-closure maintenance will be in compliance with this Order and any revisions thereof [Title 27, § 21710(c)(1)].
10. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Central Valley Water Board requesting transfer of the Order within **14 days** of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory requirements contained in General Provision K.2 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. Transfer of this Order shall be approved or disapproved by the Central Valley Water Board.

L. STORM WATER PROVISIONS

1. The Discharger shall design storm water conveyance systems for Class II units for a 1,000-year, 24-hour storm event [Title 27, § 21750(e)(3)].

2. Waste management units and their respective containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping under the precipitation conditions for the unit [Title 27, § 20365(a)].
3. Precipitation on Class II waste piles which is not diverted by covers or drainage control systems shall be collected and managed through the LCRS, which shall be designed and constructed to accommodate the precipitation conditions for each class unit [Title 27, § 20365(b)].
4. Diversion and drainage facilities shall be designed, constructed, and maintained to [Title 27, § 20365(c)]:
 - a. Accommodate the anticipated volume of precipitation and peak flows from surface runoff and under the precipitation conditions for the waste management unit.
 - b. Effectively divert sheet flow runoff laterally, via the shortest distance, into the drainage and collection facilities.
 - c. Prevent surface erosion through the use of energy dissipators where required to decrease the velocity of runoff, slope protection, and other erosion control measures where needed to prevent erosion.
 - d. Control and intercept run-on, in order to isolate uncontaminated surface waters from water that might have come into contact with waste.
 - e. Take into account:
 - i) For closed waste management units and for closed portions of units, the expected final contours of the closed unit, including its planned drainage pattern.
 - ii) For operating portions of waste management units other than surface impoundments, the unit's drainage pattern at any given time.
 - iii) The possible effects of the waste management unit's drainage pattern on and by the regional watershed.
 - iv) The design capacity of drainage systems of downstream and adjacent properties by providing for the gradual release of retained water downstream in a manner which does not exceed the expected peak flow rate at the point of discharge if there were no waste management facility.
 - f. Preserve the system's function. The Discharger shall periodically remove accumulated sediment from the sedimentation or detention basins as needed to preserve the design capacity of the system.

5. Collection and holding facilities associated with precipitation and drainage control systems shall be emptied immediately following each storm or otherwise managed to maintain the design capacity of the system [Title 27, § 20365(d)].
6. Surface and subsurface drainage from outside of a waste management unit shall be diverted from the unit [Title 27, § 20365(e)].
7. Cover materials shall be graded to divert precipitation from the waste management unit, to prevent ponding of surface water over wastes, and to resist erosion as a result of precipitation [Title 27, § 20365(f)].
8. Any drainage layer in a final cover shall be designed and constructed to intersect with the final drainage system for the waste management unit in a manner promoting free drainage from all portions of the drainage layer [Title 27, §20365(f)].