

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2007-0180

WASTE DISCHARGE REQUIREMENTS
FOR
COUNTY OF YOLO
PLANNING AND PUBLIC WORKS DEPARTMENT
YOLO COUNTY CENTRAL LANDFILL
CLASS III LANDFILLS & CLASS II SURFACE IMPOUNDMENTS
CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE MAINTENANCE,
AND CORRECTIVE ACTION
YOLO COUNTY

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

1. The County of Yolo, Planning and Public Works Department, (hereafter Discharger) owns and operates the Yolo County Central Landfill, a Class III municipal solid waste (MSW) disposal facility with Class II surface impoundments. The landfill has been in operation since 1975, servicing the incorporated and unincorporated areas of Yolo County. The landfill accepts solid wastes classified as "inert" and "nonhazardous" under Sections 20220 and 20230, Title 27 of the California Code of Regulations (Title 27). Approximately 195,000 tons per year of MSW and other waste are disposed at the site.
2. The landfill is about four miles northeast of Davis and three miles southeast of Woodland, near the intersection of Roads 28H and 104 in Yolo County. The site covers 725 acres in Sections 29 and 30, T9N, R3E, MDB&M, corresponding to Assessor's Parcel Numbers (APNs) 042-140-01, 042-140-02, and 042-140-06. See Attachment A: Location Map, which is incorporated herein and made part of this Order by reference.
3. The facility includes lined and unlined Class III landfills including lined bioreactor units, lined Class II surface impoundments, a wood and yard waste processing facility, a concrete and asphalt debris facility, a metal recovery facility, a household hazardous waste drop-off facility, and a landfill gas-to-energy plant. The Discharger also plans to construct a lined landfill-based anaerobic digestion compost pilot project on top of one of the lined landfill WMUs and develop a construction, demolition, and inerts (CDI) recycling facility.
4. Class III landfill Waste Management Units (WMUs) 1 through 5 cover approximately 123.5 acres and include unlined WMUs 1 through 4 and clay-lined WMU 5. WMUs 1, 2, 4, and 5 have not yet been brought to final grade for closure, and WMU 3 is undergoing closure during 2007.

5. Class III landfill WMUs 6 and 7 will cover an area of approximately 349.5 acres and currently consist of composite-lined modules within WMU 6, Modules 6A through 6D (hereinafter referred to as WMU 6A or WMUs 6A through 6D). Future landfill modules will consist of WMUs 6E through 6H and WMUs 7I through 7P which will also have composite liners. A small bioreactor pilot project is located within WMU 6B. WMU 6D, Phase 1 has been operated as a bioreactor demonstration project through a waiver on the addition of supplemental liquids granted by the United States Environmental Protection Agency (USEPA) under the Project XL program. WMU 6D, Phase 1 contains one aerobic bioreactor cell and two anaerobic bioreactor cells. The Discharger plans on continuing to operate WMU 6D, Phase 1 as a bioreactor and to operate future landfill modules as bioreactors. WMU 6D, Phase 2 has been constructed and filled as an anaerobic bioreactor cell, but is not covered under the USEPA waiver and has therefore not yet been operated as a bioreactor.
6. The Class II surface impoundments are WMUs G and H. The former clay-only liner system in WMU G was replaced with a composite liner system in 1995 and has a capacity of 1.5 million gallons. WMU H, completed in 1999, consists of three hydraulically connected ponds, (H1, H2, and H3), as shown in Attachment B: Site Map, which is incorporated herein and made part of this Order by reference. H3, the large pond, covers five-acres and has a capacity of 10 million gallons. H1 and H2 each cover 2.5 acres each and have a capacity of 3 million gallons each. All three surface impoundments at WMU H are hydraulically connected by overflow weirs and piping to form one WMU. WMU F, a surface impoundment described in previous waste discharge requirements (WDRs), has been decommissioned and converted into a geosynthetic-lined water storage pond.
7. On 1 August 2007, the Discharger submitted an amended Report of Waste Discharge (RWD) and Joint Technical Document (JTD) for the landfill. The information in the amended RWD/JTD has been used in writing these WDRs. The RWD/JTD contains the applicable information required in Title 27, California Code of Regulations (CCR), Chapter 4, Subchapter 3, Article 4. The RWD/JTD and supporting documents contain the following information related to this revision of the WDRs:
 - a. Operation of existing WMU 6D and future WMUs 6E through 6H and 7I through 7P as bioreactor units under Research, Development, and Demonstration (RD&D) Permits as allowed by Title 40, Code of Federal Regulations (40 CFR), Part 258.4 and Title 27 CCR Section 20070.
 - b. An increase in the final height of future WMUs 6E through 6H and 7I through 7P by 60 feet.
 - c. Landfill mining of bioreactor units to recover recyclable material and regain air space.

8. On 1 August 2007, the Discharger submitted a revised Preliminary Closure and Post-Closure Maintenance Plan for WMUs 6, 7, G, and H that included a revised closure schedule, revised closure and post-closure cost estimates, and a revised landfill stability analysis. The adoption of this Order constitutes Regional Water Board approval of this document.
9. On 24 May 2004, the Discharger submitted a revised Final Closure and Post-Closure Maintenance Plan (revised on 1 June 2004) for WMUs 1 through 5 that included a justification report for a proposed alternative geomembrane final cover, a justification report for the proposed year-round filling, and a revised closure schedule for WMUs 1 through 5. These changes were approved in previous WDRs and this Order includes a revised schedule for closure of WMUs 1 through 5.
10. On 9 October 1991, the USEPA promulgated federal MSW regulations under the Resource Conservation and Recovery Act (RCRA), Subtitle D (40 CFR, Part 258), hereafter referred to as "Subtitle D". These regulations apply to all California Class II and Class III landfills which accept MSW, including the Yolo County Central Landfill.

WASTE CLASSIFICATION AND UNIT CLASSIFICATION

11. The Discharger proposes to continue to accept landfill solid wastes classified as "inert" or "nonhazardous" under Title 27, including household, commercial, industrial, and special wastes for discharge to the Class III landfills. The special wastes include grit and screening wastes and dewatered sludge from municipal wastewater treatment plants, and alternative daily cover materials consisting of chopped green waste and Kenaf plants. The Kenaf plants are harvested from an on-site treated groundwater discharge area that is regulated under separate WDRs. Non-friable asbestos will also be accepted for discharge to non-bioreactor units that have composite liner systems (WMUs 6A, 6B, and 6C).
12. The Discharger proposes to discharge liquid wastes classified as "nonhazardous" or "designated" to the Class II surface impoundments, including landfill leachate, gas condensate, and cooling water from the power plant. The Discharger also proposes to be permitted to accept private septage, chemical toilet waste, water treatment lime sludge, and other non-hazardous or designated liquids to the Class II surface impoundments, although these waste are not currently accepted at the facility. The Discharger does not propose to accept liquid wastes defined as "hazardous" under Title 27, and these WDRs contain a prohibition against the disposal of such wastes.
13. The Discharger uses alternative daily cover (ADC) to conserve cover soil, save air space, and to prevent the formation of barriers for leachate within the waste mass. Materials used for ADC on a regular basis include temporary geosynthetic tarps and processed green waste. In the future, the Discharger may use the decomposed residual material from the mining of bioreactor units as ADC; however, this Order requires that

such material be used only in internal areas of the landfill such that any stormwater does not drain to surface water.

14. The Discharger also proposes to accept household hazardous waste at a new household hazardous waste drop off facility for recycling or offsite disposal at properly permitted facilities. Treated wood waste (TWW) will also be accepted and stored in covered bins for periodic offsite disposal at another landfill that is permitted to accept TWW.

SITE DESCRIPTION

15. The area topography is generally flat with a natural grade of approximately one foot of fall from north to south and six feet of fall from west to east. The natural elevation of the site is approximately 18 to 24 feet above mean sea level (MSL). The maximum final landfill elevation of WMUs 1 through 5 and 6A through 6D will be 81.4 feet MSL according to the NAVD 88 measurement system. The maximum final landfill elevation of WMUs 6E through 6H and 7I through 7P will be 141.4 feet MSL according to the NAVD 88 measurement system.
16. Land uses within 1,000 feet of the landfill include agriculture to the north (winter wheat, alfalfa and rice fields); a former wastewater disposal area to the west (used for spray disposal of cannery wastewater until October 1999, now used for cattle grazing); City of Davis wastewater treatment plant ponds and wastewater reclamation fields to the east and south; and the Willow Slough Bypass Channel along the southern boundary. On the other side of the Willow Slough Bypass Channel is additional agricultural cropland. The nearest residence is located approximately 700 feet south of the landfill boundary.
17. There are 57 private wells within one mile of the site, including at least 38 used for irrigation, 17 for domestic supply, and 2 for livestock. Numerous additional domestic and irrigation wells are located further from the site.

SITE GEOLOGY

18. The soils underlying the site predominantly consist of low-permeability silty clays (90 to 100 percent passing the number 200 sieve). Test borings also show an interval of laterally discontinuous silty fine sands up to 12 feet thick between 6 and 35 feet below ground surface (bgs). This interval is known as the Upper Sand. Materials below 35 feet bgs are mostly clays, interspersed with minor amounts of inter-bedded sand and gravel, to a depth of about 80 feet bgs. More abundant coarse-grained material is encountered below 80 feet bgs. Due to the discontinuities, neither the Upper nor Lower Sands have been reliably correlated from well to well.
19. There are no known active faults traversing or projected through the site. The principal seismic impact would be strong ground shaking generated by movement on one or more

of the faults in the western Sierra foothill fault system, the San Andreas fault system, and the blind thrust faults of the Sierran Block/Coast Range boundary, including the Vacaville /Winters seismic region, and the Dunnigan fault. The maximum peak ground surface acceleration estimated to occur at the site is on the order of 0.32 g. The fault nearest the site is the Dunnigan fault about 11 miles northwest of the facility. The Maximum Credible Earthquake for this fault is estimated to be magnitude 6.25.

SURFACE WATER

20. Nearby surface waters include Willow Slough Bypass on the southern property boundary, Willow Slough about 2 miles to the north, Putah Creek approximately 4 miles to the south, Cache Creek approximately 6 miles to the north, and the Yolo Bypass (an overflow conveyance of the Sacramento River) 3 miles to the east. The Willow Slough Bypass drains the southern part of the site and an unnamed canal drains the northern part of the site. The Willow Slough Bypass and the unnamed canal empty into the Yolo Bypass to the east, which drains to the Sacramento San Joaquin Delta.
21. As described in the Sacramento River San Joaquin River Water Quality Control Plan (Basin Plan), the beneficial uses of the Sacramento san Joaquin Delta are municipal and domestic supply; agricultural supply; industrial service supply; industrial process supply; water contact recreation; non-contact water recreation; warm fresh water habitat; cold freshwater habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; wildlife habitat; and navigation.
22. The landfill does not impact any jurisdictional waters of the United States (i.e., reservoirs, vernal pools and wetlands), other than the future filling of a ditch located in the WMU 7 area. This Order requires the Discharger to complete all demonstrations required for this discharge under 40 CFR 258.12(a) for Regional Water Board consideration in a future revision of the WDRs after the Discharger has completed CEQA, and obtained all necessary permits and a water quality certification.

STORM WATER

23. The facility receives an average of 19.76 inches of precipitation per year as measured at Davis between the years 1983 and 2005. About 90 percent of annual precipitation occurs between the months of October and April. The mean evaporation for this facility is 87.1 inches per year as measured at Davis between the years 1970 and 1998. Based on these data, average annual net evaporation at the facility is 67.3 inches.
24. The 100-year wet season precipitation for the facility is 31.1 inches and the 100-year, 24-hour precipitation event is 4.12 inches. The 1,000-year, 24-hour precipitation event is 5.79 inches.

25. On the latest Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for Yolo County, dated July 6, 1998, the site is identified as within Zone B, "areas protected from the 100-year flood by levee, dike, or other structures subject to possible failure or overtopping during larger floods".

GROUNDWATER

26. The groundwater table beneath the site is naturally high and is additionally elevated from crop irrigation, and wastewater reclamation activities on adjacent lands. The water table ranges seasonally between 4 and 15 feet below ground surface (bgs), corresponding to 19 and 8 feet MSL. In addition, a capillary rise up to three feet has been measured. A deeper aquifer underlies the shallow at about 80 feet bgs (-57 feet MSL).
27. The natural gradient of the shallow groundwater is to the south and southeast, but is reversed by operation of the extraction wells (these wells pump continuously year-round). Under pumping conditions, the shallow gradient is to the north/northwest. The gradient is also influenced by the wastewater reclamation and irrigation activities on surrounding lands.
28. As described in the Basin Plan, the beneficial uses of groundwater are municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.

GROUNDWATER, SURFACE WATER, AND UNSATURATED ZONE MONITORING

29. The unsaturated zone monitoring system at the landfill includes several pan lysimeters and suction lysimeters. Locations and designations of the unsaturated zone monitoring system are shown on Attachment C, which is incorporated herein and made part of this Order by reference. The detection monitoring program for the unsaturated zone at the landfill satisfies the requirements contained in Title 27.
30. The groundwater monitoring system at the landfill consists of detection monitoring wells and corrective action monitoring wells. Additional monitoring wells will be installed as future modules are constructed. A complete listing of monitoring wells and their associated monitoring programs is given in MRP No. R5-2007-0180, a part of this Order. The groundwater monitoring system is shown on Attachment D, which is incorporated herein and made part of this Order by reference. The detection monitoring program for groundwater at the landfill satisfies the requirements contained in Title 27.
31. Surface water monitoring at the landfill is conducted at four locations designated as SWP1 through SWP4, as shown on Attachment D. Each location is a point at which surface water flows offsite. SWP4 is located at the outfall of the storm water retention basin. The discharger is required to monitor storm water in accordance with MRP No.

R5-2007-0180 and the General Storm Water Permit for Industrial Activities. The detection monitoring program for surface water at the landfill satisfies the requirements contained in Title 27.

32. Volatile organic compounds (VOCs) are often detected in a release from a landfill, and are the primary waste constituents detected in groundwater beneath a municipal solid waste landfill. Since volatile organic compounds are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a Unit.
33. Title 27 CCR Sections 20415(e)(8) and (9) provide for the non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a Unit in accordance with Title 27 CCR Section 20415(b)(1)(B)2.-4. However, Title 27 CCR does not specify a specific method for non-statistical evaluation of monitoring data.
34. The Regional Water Board may specify a non-statistical data analysis method pursuant to Title 27 CCR Section 20080(a)(1). Section 13360(a)(1) of the California Water Code allows the Regional Water Board to specify requirements to protect underground 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 new release or the migration of an existing release.
35. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a Unit, this Order specifies a non-statistical method for the evaluation of monitoring data.
36. The specified non-statistical method for evaluation of monitoring data provides two criteria (or triggers) for making the determination that there has been a release of non-naturally occurring waste constituents from a Unit. The presence of two non-naturally occurring waste constituents above their respective method detection limit (MDL), or one non-naturally occurring waste constituent detected above its practical quantitation limit (PQL), indicates that a release of waste from a Unit has occurred. Following an indication of a release, verification testing will be conducted to determine whether there has been a release from the Unit, or there is a source of the detected constituents other than the landfill, or the detection was a false detection. Although the detection of one non-naturally occurring waste constituent above its MDL is sufficient to provide for the earliest possible detection of a release, the detection of two non-naturally occurring waste constituents above the MDL as a trigger is appropriate due to the higher risk of false-positive analytical results and the corresponding increase in sampling and analytical expenses from the use of one non-naturally occurring waste constituent above its MDL as a trigger.

CORRECTIVE ACTION

WMUs 1 through 5

37. Groundwater on the western part of the site has been impacted by volatile organic compounds (VOCs) from one or more of the older landfill units (WMUs 1 through 5). After installation an air stripper unit in 1993, the Discharger began groundwater pump and treat using existing de-watering wells. The treated groundwater is discharged to land under separate WDRs. Since 2004, VOCs detected in the source area at observation well OW-27 include cis-1,2 dichloroethene (up to 16 micrograms per liter ($\mu\text{g/L}$)), 1,1-dichloroethane (up to 2.0 $\mu\text{g/L}$), tetrachloroethene (up to 2.0 $\mu\text{g/L}$), trichloroethane (up to 1.8 $\mu\text{g/L}$), and vinyl chloride (up to 0.98 $\mu\text{g/L}$). Since 1993, concentrations of total dissolved VOCs at OW-27 have declined from 52.8 $\mu\text{g/l}$ to 6.8 $\mu\text{g/L}$ as of April 2007. WMUs 1 through 5 remain in a Corrective Action Monitoring Program as specified in Monitoring and Reporting Program (MRP) No. R5-2007-0180.

WMUs 6B, 6C and G

38. Following the review of the 2001 Annual Monitoring Report, Regional Water Board staff issued a 10 April 2002 letter to the Discharger requiring them to prepare an Evaluation Monitoring Program (EMP) for WMUs 6B, 6C and G. This was due to the detection of several constituents-of-concern above the concentration limits in the unsaturated zone monitoring devices for these units. The Discharger submitted the proposed EMP in July 2002, and a revised EMP in August 2002 to address Regional Water Board staff comments. Following staff approval of the EMP on 10 September 2003, the Discharger submitted 29 March 2004 *Report of Waste Discharge Proposing a Corrective Action Program for WMU 6B, WMU 6C, and WMU G*. This report presented the results of the EMP and where applicable, proposed a Corrective Action Program (CAP) for each WMU.
39. The EMP for WMU 6B included additional sampling of pan lysimeters 6B-S-LYS and 6B-N-LYS. This sampling confirmed the presence of three VOCs in 6B-S-LYS and six VOCs in 6B-N-LYS at low levels. The sampling also confirmed the presence of elevated levels of various inorganic constituents in these lysimeters. As a corrective action measure, the Discharger had already been pumping the liquid from these lysimeters and been collecting samples. The liquid in the lysimeters drains through a pipe into a manhole located outside of the WMU. Therefore, liquid would not back up into the pan lysimeter so long as the level in the manhole is kept below the invert elevation of the pipe that goes into the manhole. Approximately 2,900 gallons were pumped from 6B-N-LYS in June 2002, and approximately 7,300 gallons were pumped from 6B-S-LYS in July/August 2002. Following this pumping, relatively little additional liquid has accumulated in or has been pumped from these lysimeters. The Discharger proposed to continue this practice as a corrective action measure in the future. During the first half of 2007, the Discharger pumped 1,035 gallons from 6B-S-LYS, and liquid did not

rise above the inert elevation in 6B-N-LYS. This Order continues to require the Discharger to continue sampling and to remove any liquid above the invert pipe elevation for corresponding manhole.

40. The EMP for WMU 6C included additional sampling of suction lysimeter 6C-S-LYS. This sampling confirmed the presence of four VOCs at low levels and elevated levels of nine inorganic constituents. The analyses indicate that concentrations of inorganic constituents in the samples were higher than in leachate samples from the 6C sumps, and that there were two VOCs in the samples that were not present in the leachate. The Discharger concluded that the source of the liquid in the lysimeters was construction water being squeezed from the clay layer. However, as a corrective action measure, the Discharger proposed to install additional landfill gas (LFG) extraction wells in WMU 6C. The system was installed in 2005 and is currently operating. Lysimeter 6C-S-LYS was moved from Detection Monitoring to Corrective Action Monitoring in 2004.
41. The EMP for WMU G (a Class II surface impoundment) included some additional monitoring of suction lysimeter G-LYS-1, as well as an analysis of historical data from the lysimeter and the overlying leak detection sump, and data from nearby WMUs. The analyses confirm the presence of six VOCs in G-LYS-1; however, none of these VOCs were detected in the leak detection sump above the lysimeter. The Discharger therefore concluded that the source of the VOCs is not from the liquid in the surface impoundment. The Discharger also concluded that the source of the contamination in the suction lysimeter may be from residual contamination left in the underlying native soils following the removal of the former clay only liner system for this surface impoundment. The Discharger proposed to continue monitoring the G-LYS-1 lysimeter, and for WMU G to remain in a Corrective Action Monitoring Program as specified in MRP No. R5-2007-0180.
42. The EMP for the bioreactor pilot cell demonstration unit inside of WMU 6B included additional sampling of pan lysimeter CEC-LYS. The monitoring confirmed the presence of 20 VOCs in the lysimeter, and 15 of these were confirmed to be present in the overlying sump. The Discharger concluded that the liquid in the CEC-LYS is indeed leachate from the pilot cell unit. However, the Discharger stated that CEC-LYS was inappropriately labeled since it is really part of the primary liner system and acts as a secondary containment unit for the pilot cells. Unsaturated zone monitoring for WMU 6B in which the pilot cells are constructed is conducted at pan lysimeters beneath the 6B sumps. The Discharger proposed that the CEC-LYS be renamed CEC-SC for "secondary containment". Since unsaturated zone monitoring for all of WMU 6B is conducted at 6B-S-LYS and 6B-N-LYS, and since the CEC-LYS is part of the primary containment system for WMU 6B, CEC-LYS was renamed to "CEC-SC" as requested by the Discharger. This Order also continues to require any liquid in secondary containment sumps to be measured, recorded, and removed.

43. The LFG control system includes a gas flaring facility and a landfill gas-to-energy plant. The system currently includes vertical extraction and horizontal extraction wells and is part of the corrective action program at the landfill to prevent VOCs present in LFG from impacting groundwater.

WMU SITING AND ENGINEERED ALTERNATIVE DESIGN

44. Section 20240 (c) of Title 27 requires that new landfills, waste piles and surface impoundments be "sited, designed, constructed and operated", to ensure or maintain at least five feet of separation between the contained wastes and the highest anticipated level of the groundwater table. Existing WMUs are to be "operated" to maintain the required separation. WMUs 1, 2, 3, and 4 are "existing units" under Title 27.
45. Groundwater elevation monitoring indicates that during periods of high groundwater there is inadequate separation between groundwater and the landfill units. In siting WMU 5 (in 1988), the Discharger installed a slurry wall and a line of extraction wells along the northwest perimeter of the site to help reduce the water table to maintain the required separation. The trench for the wall was excavated to an elevation of about 15 feet below MSL. The Discharger has since been operating these de-watering wells to maintain a minimum five feet of separation.
46. The Regional Water Board (in previous requirements) approved an Engineered Alternative Design (EAD) for WMU 6A and 6B, which reduced the required amount of separation to three feet, as measured from groundwater to the base of the 60-mil HDPE primary liner. The engineered alternative design recognized the composite liner design, slurry wall, and de-watering system, as "engineered structures" for the purpose of ensuring that there is adequate separation from wastes and that an upward hydraulic head does not occur on the bottom of the liner. The Discharger agreed to continue de-watering as necessary to meet the operating requirements of Section 20240 (c) of Title 27. The EAD was approved for the remaining WMU 6 modules and the surface impoundments, however, installation of a capillary break or groundwater barrier layer and five feet of separation is required, except below the LCRS trenches and sumps where the minimum separation is three feet for WMU 6 modules and two feet for the surface impoundments. The siting designs for all the WMUs are summarized in Finding No. 54.
47. In approving these engineered alternative designs, the Regional Water Board found that the Discharger made the demonstration required by Section 20080(b) of Title 27, namely that construction of the prescriptive standard is unreasonably or unnecessarily burdensome and will cost substantially more than an EAD, and that there is a specific EAD that is consistent with both the performance goal and the prescriptive standard which affords equivalent protection against water quality impairment.

48. As part of the design analysis for the proposed increase in the ultimate height of the future landfill WMUs by 60 feet, the Discharger submitted a June 2007 *Geotechnical Evaluation* that was included in Appendix E of the July 2007 *Preliminary Closure and Post-Closure Maintenance Plan* for WMUs 6 and 7. The geotechnical evaluation included a settlement analysis for the ultimate consolidation settlement of the native soil underlying the WMU 6 and 7 expansion area. The ultimate settlement at the center of the expansion area was calculated to be 8.5 feet. The Discharger has stated that the liner grading plan will be designed to ensure the required five-foot separation between groundwater and waste would be maintained after ultimate subgrade settlement. The Discharger is also conducting a groundwater modeling study to determine if expansion of the slurry wall and groundwater extraction system will help maintain the required separation. This Order requires the Discharger to design the WMU 6 and 7 expansion area to maintain at least five-feet of separation between groundwater and waste by installing a 40-mil geomembrane capillary break five feet below the primary geomembrane to stop capillary rise (as proposed), and to design the liner grading plan to ensure five feet of groundwater separation is maintained after ultimate subgrade settlement without groundwater exerting an upward force on the capillary break layer.
49. Prior to construction of WMU 7, the Discharger must determine how groundwater separation will be maintained since WMU 7 was not included in the EAD described in Finding No. 46. Furthermore, the landfill expansion area for WMU 7 is the current location where extracted groundwater is discharged in the dry season after being stored in the groundwater storage basin. Therefore, the Discharger must find another long-term disposal option for extracted groundwater prior to constructing WMU 7 such that the groundwater extraction system can be operated for WMUs 5 and 6 for as long as the waste is a threat to water quality.
50. On 15 September 2000 the Regional Water Board adopted Resolution No. 5-00-213 *Request For The State Water Resources Control Board To Review The Adequacy Of The Prescriptive Design Requirements For Landfill Waste Containment Systems To Meet The Performance Standards Of Title 27*. The State Water Board responded, in part, that “a single composite liner system continues to be an adequate minimum standard” however, the Regional Water Board “should require a more stringent design in a case where it determines that the minimum design will not provide adequate protection to a given body of groundwater.”

In a letter dated 17 April 2001, the Executive Officer notified Owners and Operators of Solid Waste Landfills that “the Board will require a demonstration that any proposed landfill liner system to be constructed after 1 January 2002 will comply with Title 27 performance standards. A thorough evaluation of site-specific factors and cost/benefit analysis of single, double and triple composite liners will likely be necessary.”

51. The performance standard for the design and construction of a Class III waste management unit specified in Section 20310(c) of Title 27 is “Class III landfills shall have containment structures which are capable of preventing degradation of waters of the state as a result of waste discharges to the landfills if site characteristics are inadequate.”
52. The Discharger submitted a liner performance demonstration for WMU 6D, Phase 2 which demonstrates that the system will comply with the applicable Title 27 performance standards by combining a Subtitle D composite liner with additional containment components in critical hydraulic areas (i.e. sumps and trenches) and a secondary layer that provides both containment and leak detection under the entire unit.

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

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

WMU DESIGN

54. The as-built containment systems for the landfills and surface impoundments at the facility are summarized in the following table:

WMU	Year Built/ Size	WMU Base Liner Design	Design	WMU Status
			Siting	
1	1975 23.4 Acres	Subgrade sloped for leachate drainage to perimeter trench	Ch 15 (unlined)	Active ¹
2	1977 40.6 Acres	Subgrade sloped for leachate drainage to perimeter trench	Ch 15 (unlined)	Active ¹
3	1981 21.1 Acres	Subgrade sloped for leachate drainage to perimeter trench	Ch 15 (unlined)	Closure ²
4	1983 8.5 Acres	Subgrade sloped for leachate drainage to perimeter trench	Ch 15 (unlined)	Inactive ³
5	1988 30.9 Acres	Operations layer (one foot of soil) Dendritic LCRS - lateral trenches containing gravel & perforated pipe draining via longitudinal trenches and a trunk line to a pump station. Two feet of compacted clay ($k \leq 1 \times 10^{-6}$ cm/sec) Two feet of compacted clay ($k \leq 1 \times 10^{-6}$ cm/sec)	Ch 15 prescriptive liner	Inactive ³
			pump gw 5' separation	
6A	1991 19.9 Acres	Operations layer (one foot of soil) Blanket type LCRS –geonet draining via longitudinal trenches to perimeter trunk line ⁵ 60-mil HDPE liner Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec)	Subtitle D prescriptive liner	Inactive ⁴
			EAD 3' separation	
6B	1993 19.8 Acres	Operations layer – one foot of soil Geotextile cushion Blanket type LCRS –geonet draining via longitudinal trenches to perimeter trunk line ⁵ 60-mil HDPE liner 1.72 to 2.54 feet of compacted clay ($k \leq 1 \times 10^{-8}$ cm/sec)	Subtitle D prescriptive liner	Active
			EAD 3' separation	

WMU	Year Built/ Size	WMU Base Liner Design	Design	WMU Status
			Siting	
6C	1996 19.3 Acres	Operations layer – one foot of soil Geotextile cushion Blanket type LCRS –geonet draining via longitudinal trenches to perimeter trunk line ⁵ 60-mil HDPE liner Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec) Three feet earthfill 40-mil HDPE liner (capillary break)	Subtitle D prescriptive liner ⁵	Active
			EAD ⁶ 5' separation	
6D Phase 1	1999 12 acres	Same as WMU 6C except: Operations layer – three feet of shredded tires ($k \geq 1$ cm/sec) Cushion layer – six inches of pea gravel ⁷ Blanket LCRS - geotextile bonded to both sides of geonet, drains via longitudinal trenches to interior sumps ¹	Subtitle D prescriptive liner ⁵	Active
			EAD ⁶ 5' separation	
6D Phase 2	2002 12.7 acres	Operations layer – three feet of shredded tires or one foot of soil Geotextile filter layer LCRS – 1 foot thick layer gravel ⁷ Primary Liner - 60-mil HDPE geomembrane Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec) Three feet of compacted earthfill Leak detection geocomposite drainage layer 40-mil HDPE geomembrane liner	Subtitle D prescriptive liner ⁵	Active
			EAD ⁶ 5' separation	
6E-6H & 7I-7P	Future Modules	Operations layer – three feet of shredded tires or one foot of soil Geotextile filter layer LCRS – 1 foot thick layer gravel ⁷ Primary Liner - 60-mil HDPE geomembrane Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec) Three feet of compacted earthfill Leak detection geocomposite drainage layer 40-mil HDPE geomembrane liner	Subtitle D prescriptive liner ⁵	Future Modules
			EAD ⁶ 5' separation	
G	1995 2.0 acres 1.5 MG	Southern half lined inside with compacted concrete, halves separated by concrete wall Primary liner - 60-mil HDPE geomembrane ($k \leq 1 \times 10^{-7}$ cm/sec) Blanket LCRS – geonet, drains via longitudinal trenches to interior sumps Secondary liner - 40-mil HDPE geomembrane Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec) One to three feet earthfill, 40-mil HDPE geomembrane (capillary break)	Exceeds T27 prescriptive	Active
			EAD ⁸ 5' separation	

WMU	Year Built/ Size	WMU Base Liner Design	Design	WMU Status
			Siting	
H	H1 & H2 2.5 acres 3 MG	Same as WMU G except no concrete lining or interior walls. All three impoundments hydraulically connected by overflow weirs and pipes over sides which allow pumping from one to the other	Exceeds T27 prescriptive	Active
	H3 5 acres 10 MG		EAD ⁸ 5' separation	

1. WMUs 1 and 2 may receive waste to reach final grade for closure. Closure required by 2012, see Finding 74.
2. WMU 3 to be closed during 2007.
3. WMUs 4 and 5 may receive waste to reach final grade for closure. Closure required by 2014, see Finding 74.
4. WMU 6A is currently inactive but may require reactivation to fill within WMU 5 and WMU 6 to achieve final grade for closure.
5. LCRS trenches and sump areas have double-composite liner
6. Minimum separation reduced to three feet in LCRS trench and sump areas per EAD.
7. Regional Water Board staff may approve of other materials in lieu of pea gravel upon a demonstration by Discharger that they will provide adequate drainage and will not damage the geomembrane.
8. Minimum separation is reduced to two feet under LCRS trench and sump area per EAD.

55. Leachate from the unlined WMUs and WMU 5 is conveyed via trunkline to Pump Station No. 1, while leachate from WMUs 6A, 6B, and 6C is conveyed to Pump Station No. 2. Both pump stations pump to WMU G or H. Leachate from WMU 6D is conveyed directly to WMU G or H from its four leachate sumps. Liquid from each surface impoundment's LCRS is returned to that impoundment.

BIOREACTORS

56. Bioreactors are an alternative to the traditional "dry tomb" waste management method in which the natural degradation rate of the waste is intentionally accelerated by the addition of moisture in a controlled manner. Leachate collected in the bioreactor's LCRS is returned to the waste mass, and other liquid wastes can also be added to achieve optimum moisture for degradation of the organic portion of the waste. Accelerated degradation of the waste also creates additional landfill gas that must be removed and can be used to generate electricity. Accelerated biodegradation also creates additional air space, and reduces the threat of the waste to water quality more quickly than with traditional landfills.
57. On 21 April 2004, USEPA revised 40CFR, Part 258.4 allowing states to issue Research, Development, and Demonstration (RD&D) Permits to provide variance from liquids restrictions at MSW landfills provided that the state obtains USEPA approval under the

new rule. In order to implement the new rule in California, the State Water Resources Control Board made revisions to Resolution No. 93-62 *Policy for Regulation of Municipal Solid Waste* on 21 July 2005, and made revisions to Title 27 CCR (Section 20070) allowing regional water boards to issue RD&D Permits through revision or adoption of waste discharge requirements. USEPA approved California under the new rule on 19 October 2007. This Order provides the requirements for the Discharger to operate bioreactors under the RD&D rule.

58. 40 CFR, Part 258.4 allows states to issue RD&D Permits providing variance from liquids restrictions provided that the landfill unit has an LCRS that is designed and constructed to maintain less than a 30-centimeter (~12-inch) liquid depth on the liner. The permits may be issued for a period of up to three years at which time dischargers may apply for another three-year period for a total of up to twelve years (four three-year periods). The MSW landfill units must only receive types and quantities of waste the "State Director" (for purposes of this permit, the "State Director" is the Regional Water Board) deems appropriate for the purposes of demonstrating the efficacy and performance capabilities of the technology or process. The RD&D Permits must include requirements necessary for protection of human health and the environment, requirements to provide information necessary to assess the operation of the facility, and require annual reports showing whether and to what extent the site is progressing in attaining project goals. The "State Director" may order an immediate termination of all operations related to variance from liquids restrictions if it is determined that project goals are not being attained, including protection of human health and the environment.
59. Between 1999 and 2001, one aerobic and two anaerobic bioreactor units were constructed in WMU 6D, Phase 1 and have been operated under a waiver from USEPA as a demonstration project. The units were equipped with instrumentation placed at various levels within the bioreactor cells to monitor process conditions, including temperature sensors, moisture sensors, and pressure transducers. The pressure transducers measure hydrostatic head in the LCRS. Multi-port water injection and gas recovery systems were also placed at various levels within the waste. Recovered LFG is routed to the landfill's gas-to-energy plant for generation of electricity. After many years of operation, the Discharger reports that the operation of the modules in WMU 6D, Phase 1 as bioreactors has resulted in a four to seven-fold increase in LFG production, and a corresponding increase in the rate of waste decomposition.
60. Previous WDRs required the bioreactors constructed in WMU 6D, Phase 1 to maintain a liquid depth of less than 4 inches on the liner system, and to cease discharge of liquids to the units if the depth of liquid on the liner exceeded 10 inches. The new USEPA rule allows a depth of up to 30 centimeters, or approximately 12 inches. This Order requires bioreactor units, including WMU 6D, Phase 1, to maintain a liquid depth on the liner of less than 6 inches by adjusting liquids addition to the unit to maintain liquid levels below that depth, and to cease discharge of liquids to the unit if the liquid depth on the liner

equals or exceeds 12 inches. The allowable depth is increased to 6 inches since the USEPA Rule allows up to 12 inches, but is held at 6 inches as a precaution against violating the rule and since the Discharger has been able to operate their bioreactors in the past with a maximum depth of 4 inches. Monitoring and Reporting Program No. R5-2007-0180 also requires the Discharger to submit an annual report with all bioreactor data and an assessment as to whether the bioreactors are attaining their project goals. As required for RD&D permits, the variance from liquids restrictions authorized by this Order is effective for up to three years, at which time the RD&D permit would need to be renewed for the exemption from liquids restrictions to continue. The exemption from liquids restrictions allowed under this RD&D Permit therefore expires three years after the date of adoption of the Order. The RD&D Permit may be terminated earlier by the Executive Officer or the Regional Water Board if determined to be a threat to human health or the environment.

61. The bioreactors are instrumented and LFG piping and liquid injection piping is placed as they are filled. Previous bioreactor cells were covered with a geomembrane prior to the start of liquid injection to inhibit the uncontrolled inflow and outflow of liquids and gases from the cell surface. For future bioreactor cells, the Discharger proposes to cover the cells with a biocover prior to the start of liquid injection. A biocover is a permeable cover that allows some liquid through from rainfall and has been shown to be effective in removing methane from landfill gases that permeate through it. This Order requires daily inspections for leachate seeps on days that liquids are added, and weekly inspections when only leachate is being recirculated. The Order also requires inspections after significant rainfall events (greater than one inch).
62. The Discharger proposes to mine bioreactor units for recyclable material and use the decomposed residual undersized material as ADC. The Discharger will mine the aerobic cell within WMU 6D first to determine if mining of bioreactor units is cost effective or if there are other issues that would make mining of bioreactor units undesirable. The Discharger's long-term plan is to fill bioreactors to approximately two-thirds of design capacity, operate them for seven to ten years, fill them to full capacity, operate them for another seven to ten years, fill to full capacity, operate for another seven to ten years, and then either mine them or fill them to full capacity and close them. This Order includes requirements for mining of bioreactor units that do not allow nuisance odors beyond the landfill property boundary, that require the residual non-recyclable material to be stored on an impermeable pad and covered, that only allow mining of bioreactors during the dry season, and that require mined bioreactor units to be prepared for the wet season by 1 November of each year.
63. The Discharger submitted an updated landfill stability analysis included in Appendix E of the July 2007 *Preliminary Closure and Post-Closure Maintenance Plan* for WMUs 6 and 7. The updated stability analysis was necessary due to the 60-foot height increase and to account for any changes in the internal shear strength of the waste caused by the

addition of liquids¹. The stability analysis indicated a static factor of safety of 1.5 which is equal to the minimum factor of safety required by Title 27. The stability analysis also included a dynamic analysis for the Maximum Probable Earthquake as required by Title 27. The analysis indicated a displacement of up to 2.6 inches which is less than the 6 inches of displacement generally considered to be acceptable for landfills.

OPERATION OF FACILITIES

64. Refuse is placed in the landfill by compacting lifts approximately two feet thick until a total lift thickness of about 14 feet is obtained. A 6-inch thick layer of clean soil is then placed over the refuse as daily cover and compacted at the end of each day and up to 12-inches of intermediate cover is placed over the top and external side slopes of the cell. Alternative daily covers with a maximum exposure time of 21 days are used on the internal side slopes.
65. Expansion will be accomplished by the addition of new Class III landfill units in the area east of the existing WMUs. The landfill will be developed by extending the road north of the surface impoundments out to the east. The landfill units will extend to within approximately 100 feet of the property boundary.
66. The Discharger proposes to use alternative daily and interim cover due to soil deficiencies at the facility. The type of products and material to be considered as ADC include but are not limited to commercially available foams, spray-ons, and geosynthetics, as well as indigenous materials, such as ash based materials, sludge, chipped green waste, compost, and shredded tires as discussed in EPA Document 600/R-93/172. Each material to be used will be approved before use by the appropriate regulatory agencies, including Regional Water Board staff. In separate WDRs, the Regional Water Board has already approved the use of Kenaf plants harvested from the groundwater discharge area as ADC during the dry season. This Order also approves the use of Kenaf as ADC at the landfill. In addition to daily cover or ADC applied where there is active waste filling, interim cover will be applied to areas of the landfill where filling is not anticipated within 180 days. Landfill areas that are not used for more than 30 days during the wet season, running from 1 November through 30 April, will have a minimum of one foot of interim cover placed on them.
67. To control and recover LFG, the Discharger has installed a gas extraction system and has been extracting LFG since 1985. The LFG is piped to an onsite power plant, which

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

burns the gas to generate electricity. The gas extraction system and cogeneration plant are owned and operated by a third party contractor, which sells the power in the private market.

68. During evaporation operations, the large surface impoundment (H3) will be operated at a constant level, and any excess will be pumped into the smaller storage ponds. During the wet season, the large pond will also be used for leachate storage.
69. Subject to federal Subtitle D regulations, Title 27 includes the following regulations regarding the discharge of liquids to a landfill:
 - a) Section 20340 (g) requires that leachate be returned to the same WMU or to another authorized disposal facility. This section also allows leachate to be discharged to a different WMU provided that:
 - i. The receiving unit has an LCRS, at least the same classification as the originating unit, and contains wastes of similar classification and characteristics as those in the originating unit; and
 - ii. The discharge is approved by the Regional Water Board; and
 - iii. The discharge does not exceed the moisture-holding capacity of the receiving unit, and complies with Title 27, Section 20200(d).
 - b) Under Section 20200(d)(3), liquids and semi-solid wastes (other than de-water sewage sludge) may not be discharged to a Class III landfill unless the Discharger can demonstrate that the discharge will not exceed the moisture-holding capacity of the landfill.

These WDRs contain a prohibition against the discharge of leachate and/or supplemental liquids into a landfill WMU, including bioreactor units, in excess of the waste's moisture holding capacity.

70. Previous WDRs Order No. R5-2002-0118 limited filling in unlined WMUs 1 through 4 to the dry season. This requirement was intended to prevent excessive infiltration since the intermediate cover would not be present in the area of filling. The Discharger submitted a 12 March 2004 *Justification Report for the Proposed Year-Round Filling of Waste Management Units 1-5* that presented their justification to allow year-round filling in these WMUs. The report included estimates of infiltration into the waste for each of these WMUs with and without wintertime filling. The report indicates that the difference in infiltration caused by removing the intermediate cover in the filling area was negligible compared to the benefit derived from reaching final grades years sooner so that the final

cover could be installed. This Order therefore continues to allow year-round filling in these WMUs.

71. Previous WDRs for the facility required interim cover to be a minimum of two feet thick. The Discharger submitted a 23 July 2004 *Justification for One Foot of Interim Cover* report presenting justification to reduce the minimum interim cover thickness to one foot, which is the minimum thickness required by Title 27. In the report, Discharger argued that since the approved final cover design calls for one foot of foundation layer, that the requirement for two feet of interim cover would mean having to remove one foot of the interim cover to obtain a one foot thick foundation layer at closure. To demonstrate equivalency, the Discharger used the Visual Hydrogeologic Evaluation of Landfill Performance (VHELP), Version 2.2 model to compare the performance of a one-foot vs. a two-foot thick interim cover composed of identical soils. The results of the VHELP model indicate that the amount of percolation into the waste is virtually identical (within about 3% of each other). Therefore, this Order continues to require a minimum interim cover thickness of one foot at the landfill.

CLOSURE

Closure of WMUs 1 through 5

72. WMUs 1, 2, 4 and 5 have been inactive since 1992, but were never closed and must therefore comply with Subtitle D. Filling in WMU 3 resumed in 2002. The units have two to four feet of intermediate cover and have settled about three feet since 1992.
73. The Discharger has submitted a revised Final Closure and Post-Closure Maintenance Plan (FCP) for WMUs 1 through 5, which proposed phased closure beginning with WMU 3. Under the plan, intermediate cover will be removed in areas where additional fill is needed, and wastes will then be discharged to reach final grade. There will be no lateral expansions of any of the units. Soil will then be re-applied as intermediate cover and engineered as foundation layer for final cover.
74. This Order requires WMUs 1 through 5 to be closed in accordance with the following schedule:

Closure Schedule for WMUs 1-5		
WMUs to be Closed	Date to Complete Filling	Date to Complete Closure Construction
WMU 1/2	2011	2012
WMU 3	2006	2007
WMU 4/5	2013	2014

75. Two final cover design options may be utilized for the top deck and side-slopes of WMUs 1 through 5:

Option 1 from top to bottom is as follows:

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

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

Option 2 from top to bottom is as follows:

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

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

76. The above referenced January 2003 Alternative Cover Justification Report also includes a slope stability analysis for the proposed 3:1 side-slopes indicating the cover will be stable under dynamic conditions; a settlement analysis indicating that settlement of the waste after closure will not cause drainage problems; a drainage layer analysis indicating that the geocomposite drainage layer on the side-slopes will provide adequate drainage to prevent excess pore pressure from building up in the overlying soil layer;

and describes the installation of horizontal LFG extraction piping during filling to remove LFG and excess moisture from the waste and from beneath the geomembrane layer of the final cover system. Further details on each of these topics can be found in the report.

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

Closure of WMUs 6 and 7

78. The Discharger has submitted a Preliminary Closure and Post-Closure Maintenance Plan (PCPMP) for WMUs 6 and 7, and required periodic updates. As with WMUs 1 through 5, closures of modules in WMUs 6 and 7 will be implemented in phases as the modules are filled and allowed to settle.
79. The final cover design for the top deck and sides slopes of WMUs 6 and 7 will be as follows:
- Erosion-resistant/Vegetative Cover layer:
One-foot vegetative cover soil
 - Low hydraulic conductivity/barrier layer:
Geocomposite drainage layer (geonet bonded to geotextile)
40-mil linear low-density polyethylene liner (LLDPE) w/surface texturing (asperity height) of at least 20-mils on both sides
Geosynthetic clay liner ($k \leq 1 \times 10^{-8}$ cm/sec) reinforced by stitching or needle punching
 - Foundation layer - two-feet of compacted soil or existing intermediate cover

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

goals and the prescriptive standards of Title 27 and affords equivalent protection against water quality impairment.

80. The top deck of WMUs 6 and 7 will be sloped at 5% for adequate drainage. Perimeter slopes will be not greater than 3:1 (horizontal-to-vertical). Designing and constructing 15-foot wide benches will achieve erosion control and access at least every 50 vertical feet, as required under Section 21090 of Title 27. The maximum elevation upon closure of WMUs 6A through 6D will be 81.4 feet MSL (NAVD 88), approximately 60 feet above surrounding (undisturbed) grade. The maximum elevation upon closure of WMUs 6E through 7P will be 141.4 feet MSL, approximately 120 feet above surrounding grade.
81. The incremental closure schedule for WMUs 6 & 7 outlined in the PCPMP is as follows based on existing waste inflow to the landfill. If waste inflow increases or decreases, the closure schedule will be adjusted accordingly.

Preliminary Closure Schedule for WMUs 6 & 7	
WMUs to be Closed	Year to Complete Closure Construction
6A-D	2017-2028
6E-H	2058-2070
7I-L	2079-2081
7M-P	2081

Closure of Surface Impoundments

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

FINANCIAL ASSURANCES

83. Title 27 requires that the Discharger provide financial assurances to the California Integrated Waste Management Board (CIWMB) for closure and post-closure maintenance. The financial assurance mechanism consists of an enterprise fund for closure and post-closure maintenance. Monies are paid into the fund annually as waste is discharged to the landfill. According to a 21 June 2006 letter from the CIWMB, the

fund contained \$12.9 million which was more than the \$11.6 million required at that time. The Discharger's 2007 annual report on financial assurance indicated the fund contained approximately \$13.5 million. This Order requires the Discharger to maintain closure and post-closure financial assurances with the CIWMB as required by Title 27.

84. The estimated closure costs for the facility are as follows:

WMU	Closure and Post-Closure Cost Estimates			Total (\$M)
	Closure (\$M)	Post-Closure		
		Annual (\$K)	30-Years (\$M)	
1 – 5 ¹	7.9	115	3.5	11.4
6 & 7 ²	39.1	191	5.7	44.8
G & H ³	---	---	---	---

1. As presented in the 2004 closure and post-closure maintenance cost estimate.
2. As presented in the 2007 closure and post-closure maintenance cost estimate.
3. Clean closure projected at the end of the post-closure period for WMUs 6 and 7. Closure costs included in estimate for WMUs 6 & 7.

85. Title 27 requires that the Discharger provide financial assurance to the CIWMB for corrective action of all known or reasonably foreseeable releases. According to a 21 June 2006 letter from the CIWMB, the fund contained \$705,125 which was more than the \$359,208 required at that time. The Discharger's 2007 annual report on financial assurance indicated the fund contained over \$866,000. The total amount of the cost estimate in 2006 was \$1.78 million. This Order requires the Discharger to maintain corrective action financial assurances with the CIWMB as required by Title 27.

CEQA AND OTHER CONSIDERATIONS

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

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

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

88. The 1992 EIR evaluated the impacts and found that the implementation of a corrective action plan and compliance with Title 27 and Subtitle D will provide adequate water quality protection and reduce potential impacts to a less-than-significant level. These WDRs include requirements that avoid or substantially lessen any potential significant impacts to water quality.
89. On 29 September 2005, the Yolo County Board of Supervisors approved a final EIR for various changes at the landfill including operating of future landfill modules as bioreactors, increasing the final height of the landfill by 60 feet, landfill mining of waste management units, construction of a material recovery facility, expansion of salvaging operations, and expansion of LFG management and utilization options. The 2005 EIR also proposed expansion of an existing composting facility at the landfill, however, no composting is currently conducted and none is currently proposed. Regional Water Board staff has considered these documents in preparation of these WDRs.
90. The 2005 EIR identified the following potential significant water quality impacts that are related to the proposals in the 2007 JTD:
 - a. Potential leakage of leachate from the bioreactors to groundwater.
 - b. Potential for future mining of bioreactors to remobilize metals and other contaminants from the waste.
 - c. Potential for storm water runoff from the landfill or proposed construction activities to degrade receiving waters.
91. The 2005 EIR evaluated the impacts and proposed mitigation measures to reduce the potential impacts to a less-than-significant level. These WDRs include requirements that avoid or substantially lessen any potential significant impacts to water quality. These requirements include, but are not limited to, composite liner systems with additional leak detection layers, separation of waste from groundwater, landfill mining activities being limited to the dry season, stockpiling and storage of mined material on lined pads that are bermed or equipped with an LCRS, covering of mined material during the rainy season, and use of mined material as ADC only on internal landfill areas where runoff does not go to surface water.
92. The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resource Code Section 21000, et seq., and the CEQA guidelines, in accordance with Title 14 CCR, Section 15301.

93. 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 Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions;
 - c. The prescriptive standards and performance criteria of RCRA Subtitle D, 40 CFR Part 258; and
 - d. State Water Resources Control Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993, and revised on 21 July 2005.
94. Section 13267(b) of California Water Code provides that: "In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or 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 having discharged or 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 regional 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."
95. The technical reports required by this Order and the attached "Monitoring and Reporting Program No. R5-2007-0180" 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

96. 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.
97. The Regional Water Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

98. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.
99. Any person affected by this action of the Regional Water Board may petition the State Water Resources Control Board to review the action in accordance with Sections 2050 through 2068, Title 23, California Code of Regulations. The petition must be received by the State Water Resources Control Board, Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812, within 30 days of the date of issuance of this Order. Copies of the laws and regulations applicable to the filing of a petition are available on the Internet at http://www.waterboards.ca.gov/water_laws/index.html and will be provided on request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order No. R5-2004-0134 is rescinded, and that the County of Yolo, Planning and Public Works Department, its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of 'hazardous waste' is prohibited. For the purposes of this Order, the term 'hazardous waste' is as defined in Title 23, California Code of Regulations, Section 2510 et seq.
2. The discharge of 'designated waste' to any landfill unit is prohibited. For the purposes of this Order, the term 'designated waste' is as defined in Title 27.
3. The discharge of wastes outside of a Unit or portions of a Unit specifically designed for their containment is prohibited.
4. The discharge of waste to a closed Unit is prohibited.
5. The discharge of waste constituents to the unsaturated zone or to groundwater is prohibited.
6. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.
7. With the following exceptions, the discharge of liquid wastes or semi-solid waste (i.e., waste containing less than 50 percent solids) to landfill WMUs is prohibited:
 - a. Landfill leachate and supplemental liquids (listed in Discharge Specification No. B.5 herein) may be discharged to the bioreactor cells at WMU 6B (pilot project cells), WMU 6D, and future WMU 6E for up to three years from the date of the

adoption of this Order. The three-year limitation does not apply to bioreactor units that are covered under a valid waiver on liquids restrictions issued by USEPA.

- b. De-watered sewage or water treatment sludge may be discharged to any active landfill modules with composite liners, as provided in Section 20220(c) of Title 27.
8. The discharge of solid waste containing free liquid or moisture in excess of the waste's moisture holding capacity is prohibited.
 9. The disposal of containerized liquids at this facility is prohibited.
 10. The discharge of waste within 50 feet of surface waters is prohibited.
 11. 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 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
 - b. are "restricted hazardous wastes", or
 - c. impair the integrity of containment structures, is prohibited.
 12. The disposal of wastes containing greater than one percent (>1%) friable asbestos is prohibited.
 13. The discharge of non-friable asbestos to unlined units or bioreactor units is prohibited.
 14. The discharge of treated wood waste, except to covered bins for transfer to a landfill that accepts treated wood waste, is prohibited.

Surface Impoundments

15. The discharge of hazardous wastes to any surface impoundment is prohibited.
16. The discharge of liquid waste to the Water Storage Pond, which is located where WMU F used to be, is prohibited.
17. Except for semi-solid wastes and solids that settle from the impounded liquid, the discharge of solid wastes to any surface impoundment is prohibited.
18. The discharge of landfill or surface impoundment wastes to the storm water sedimentation basin is prohibited.

B. DISCHARGE SPECIFICATIONS

1. Nonhazardous solid wastes shall be discharged to either:
 - a. To an existing unlined Unit (*existing MSWLF unit* as defined in 40 CFR 258.2) to bring it up to final grade for closure; or
 - b. To a Unit equipped with a composite liner containment system which meets the requirements for both liners and leachate collection and removal systems specified under D. Construction Specifications.
2. The discharge shall remain within the designated disposal area at all times.
3. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the landfill property.
4. Prior to the discharge of waste to a waste management module, all wells within 500 feet of the module shall have sanitary seals which meet the requirements of the Yolo County Health Department or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Regional Water Board and to the State Department of Water Resources.
5. Liquids discharged to a bioreactor cell shall be limited to leachate and supplemental liquids necessary to reach and/or maintain bioreactor wastes at optimum moisture content without exceeding the waste's moisture holding capacity. Supplemental liquid additions shall be limited to the following:
 - a. Non-hazardous liquids from the surface impoundments.
 - b. Landfill gas condensate.
 - c. Extracted groundwater.
 - d. Treated and disinfected municipal wastewater.
 - e. Food processing liquid waste.
6. Liquids discharged to the Class II surface impoundments (WMUs G & H) shall be limited to the following:
 - a. Landfill leachate.
 - b. Landfill gas condensate.
 - c. Cooling water from the landfill gas-to-energy plant.
 - d. Liquids from the surface impoundment's LCRS.
 - e. Septic wastes.
 - f. Chemical toilet waste.
 - g. Water treatment lime sludge.

- h. Other non-hazardous liquid wastes so long as they do not cause violations of this Order such as nuisance conditions, reaction products, capacity problems, or impairment of liner integrity.

7. Material used for Alternative Daily Cover shall be limited to the following:

- a. Screened or composted green waste.
- b. Kenaf plants from the groundwater disposal area.
- c. Residual under-sized fraction material from mining of bioreactor units (for use on internal landfill areas only such that stormwater runoff cannot travel outside of the landfill unit).
- d. Tarps.
- e. Other materials approved by Regional Water Board staff.

C. FACILITY SPECIFICATIONS

1. 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 Regional 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.
2. The Discharger shall immediately notify the Regional Water Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
3. Water used for facility maintenance shall be limited to the minimum amount necessary for dust control and construction.
4. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.
5. The Discharger shall conduct an annual test of all LCRSs at each landfill and surface impoundment to demonstrate proper operation as required by Section 20340(d) of Title 27. The Discharger may use any method that will demonstrate the LCRSs are operating properly.
6. All landfill modules shall be equipped with horizontal landfill gas extraction wells during filling as described in the Final Closure Plan for WMUs 1 through 5 and the Preliminary Closure Plan for WMUs 6 & 7. Landfill gas shall be extracted from each new and existing extraction well at rates sufficient to prevent migration of landfill gas outside of the units.

7. Interim cover shall be applied to areas of the landfill where filling is not anticipated within 180 days. Landfill areas that are not used for more than 30 days during the wet season, running from **1 November** through **30 April**, shall have a minimum of one foot of interim cover placed on them. Interim cover shall consist of at least one foot of compacted low permeability soil or an approved EAD. Interim cover soil on side-slopes shall be protected from erosion.
8. Surface drainage within the waste management facility shall either be contained on-site or be discharged in accordance with applicable storm water regulations.
9. The Discharger shall maintain its current *Storm Water Pollution Prevention Plan and Monitoring Program and Reporting Requirements* in accordance with State Water Resources Control Board Order No. 97-03-DWQ, or retain all storm water on-site.
10. With the following exceptions, a minimum separation of 5 feet shall be maintained between wastes (or leachate) and the highest anticipated elevation of underlying groundwater, including the capillary fringe:
 - a. A minimum of three feet of separation shall be maintained between the primary liner and high groundwater, including the capillary fringe, at WMU 6A and 6B, per the EAD described in Finding Nos. 46 and 54 of this Order.
 - b. A minimum of three feet of separation shall be maintained between the primary liner and installed capillary break at the LCRS trenches and sumps for WMU 6C and 6D, per the EAD described in Finding No. 54 of this Order. A minimum of five feet shall be maintained between the primary liner and an installed capillary break at the remainder of WMU 6 liner system (6C and 6D) per the EAD described in Finding Nos. 46 and 54 of this Order.
 - c. A minimum of five feet of separation shall be maintained between the primary liner and installed capillary break at future modules to be constructed in WMU 6, per the EAD described in Finding No. 46.
11. The Discharger shall operate the groundwater extraction and treatment system as necessary to maintain required separation between groundwater and waste for as long as the waste in WMUs 5 and 6 is a threat to water quality.
12. In addition to sampling required by MRP No. R5-2007-0180, any liquids or leachate detection in a pan lysimeter or a secondary containment sump shall be removed from the lysimeter/sump (or corresponding manhole) such that liquid does not back-up into the lysimeter or sump and shall be handled/disposed of as leachate. The Discharger shall measure, record and tabulate the elevation of the liquid and the amount of liquid removed from each lysimeter, sump or manhole.

13. The Discharger shall provide engineered structures or drainage systems to insure upward hydraulic head due to high groundwater does not occur on any new WMU liner. Where a synthetic liner is used for a capillary break, it shall be installed in the upper portion of the capillary fringe to minimize the potential for upward hydraulic head on the capillary break. The construction of new WMUs shall include a monitoring network to determine groundwater elevations and whether upward hydraulic head due to high groundwater occurs on any new WMU liner or capillary break. If the Discharger or Regional Water Board determines through analyses of monitoring data that upward hydraulic head has occurred on the liner or capillary break, the Discharger shall submit a revised Report of Waste Discharge within 180 days which specifies the method by which upward hydraulic head on the liner due to high groundwater will be prevented and a time schedule for remedial action.
14. Annually, prior to the anticipated wet season but no later than **1 November**, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the facility and to prevent surface drainage from contacting or percolating through wastes. By **1 October** of each year, the Discharger shall submit to the Regional Water Board a Winterization Plan describing measures planned to prepare the site and conduct operations during the wet season. By **1 December** of the same year, the Discharger shall submit an Annual Winterization Report (AWR) to the Regional Water Board describing implementation of the Winterization Plan and measures taken to comply with this specification.

Operation and Mining of Bioreactor Units

15. The Discharger shall submit a revised Bioreactor O&M Plan for review and approval at least 60 days prior to any proposed changes to the operations and/or maintenance of the bioreactors. The Bioreactor O&M Plan should outline strategies and methods for leachate re-circulation, supplemental liquid injection, preventing wastes from exceeding their moisture holding capacity, and monitoring leachate seeps.
16. Bioreactor units shall be covered with a geomembrane or a biocover prior to the start of liquid injection. Bioreactor units with a biocover shall be inspected for leachate seeps daily when liquids are added, and weekly when only leachate is being recirculated. Bioreactors with a biocover shall also be inspected for leachate seeps after any rain event of one inch or greater over a 24-hour period.
17. The hydraulic head on the liners for the bioreactor units shall not exceed six inches. If LCRS monitoring indicates that the hydraulic head on the liner exceeds this value, the Discharger shall immediately adjust the liquid injection rate, check the sump pumps for proper operation, and implement other appropriate measures to reduce the head, as set forth in the Bioreactor O&M Plan. If the hydraulic head on any bioreactor unit liner

equals or exceeds 12 inches, the Discharger shall immediately (1) notify the Regional Water Board, (2) cease the discharge of liquids to the unit, and (3) implement any other necessary corrective measures to reduce the head to six inches or less.

18. Mining of bioreactor units shall only be conducted between **15 May** and **15 October**. Mining of bioreactor units shall not be conducted during precipitation events, or when precipitation is predicted to occur.
19. Mining of bioreactor units or stockpiling of mined material shall not cause objectionable odors beyond the landfill property boundary.
20. Mining of bioreactors shall not be conducted within five feet of the underlying operations layer.
21. Stockpiling of the mined residual under-sized fraction material shall only be conducted on an impermeable pad or a portion of a composite lined module that is bermed to prevent runoff of leachate or contact stormwater and that cannot be damaged by equipment. Pads constructed of concrete shall be steel-reinforced and shall be treated with a surface sealant to prevent leakage.
22. Stockpiled mined residual under-sized fraction material shall be covered during the wet season from **1 November** to **30 April** and during any precipitation event that occur during the dry season to prevent contact of the material with rainwater.
23. By **1 November**, bioreactor units that have been mined shall be prepared for the wet season including, but not limited to, placement of cover over exposed waste.

Operation of Surface Impoundments

24. Per the EAD described in Finding Nos. 46 and 54, a minimum of minimum of five feet of separation shall be maintained between the secondary liner and installed capillary break or groundwater barrier layer at all surface impoundments, except under the LCRS trenches and sumps where the minimum separation is two feet.
25. As a means of discerning compliance with Discharge Specification B.3, the dissolved oxygen content in the upper zone (one foot) of the Class II surface impoundments shall not be less than 1.0 mg/L.
26. At least **two feet** of freeboard shall be maintained in the Class II surface impoundments at all times except that liquid may be allowed in WMU H to drain from one impoundment to another from the overflow weirs.
27. Class II surface impoundments and related containment structures shall be operated and maintained to prevent, to the greatest extent possible, inundation, erosion, slope

failure, washout, and overtopping under 1,000-year, 24-hour precipitation conditions, and shall be designed to contain the 100-year wet season precipitation without using the required two feet of freeboard.

28. The Discharger shall submit a revised Surface Impoundment O&M Plan to the Regional Water Board if any changes to the operations and/or maintenance of the surface impoundments are to occur. The Surface Impoundment O&M Plan shall outline strategies and methods for evaporating leachate, minimizing vectors and odors, managing pond levels, conducting liner inspections, cleaning the ponds and other relevant information. The plan shall include calculations as to the amount of leachate expected to be generated in and pumped from the LCRS back into the impoundment under normal operations in the absence of a liner failure. The plan shall identify the failure criteria of the upper liner and include a response plan in the event of an upper liner failure.
29. Solids which accumulate in the surface impoundments shall be removed as necessary to maintain minimum freeboard requirements and sufficient capacity for leachate storage and disposal. Prior to removal of these solids, sufficient samples shall be taken for their characterization and classification pursuant to Article 2, Subchapter 2, Chapter 3, Division 2 of Title 27. The rationale for the sampling protocol used, the results of this sampling, the rationale for classification of the solids, and if necessary, the measures for drying the solids prior to disposal shall be included in the Surface Impoundment O&M Plan.
30. Liquid collected in the surface impoundment's LCRS shall not exceed design requirements. If the amount of liquid generated exceeds the failure criteria of the primary liner, then the Discharger shall immediately cease discharges to the leaking surface impoundment, and shall notify the Regional Water Board in writing within seven days. Notification shall include a timetable for remedial action to repair the upper liner to the impoundment or other action necessary to reduce leakage production as set forth the Surface Impoundment O&M Plan.

D. CONSTRUCTION SPECIFICATIONS

1. Each landfill unit phase constructed after the effective date of this Order shall be designed and constructed in accordance with Title 27 and this Order and approved by Regional Water Board staff prior to operation. Prior to the beginning of construction for each new construction phase, a Final Design Report shall be submitted to the Regional Water Board for review and approval and shall include, but not be limited to, the engineered design plans for the WMU, the contract specifications, a construction quality assurance (CQA) plan to verify that construction specifications will be met, and a revised water quality monitoring plan. Approval of the final design report shall be obtained from Regional Water Board staff prior to construction of the landfill liner or

final cover. A final construction report shall be submitted after each phase of construction and must be approved prior to the discharge of waste into the constructed phase. The final construction report shall include, but not be limited to, as-built plans for the WMU, a CQA report with a written summary of the CQA program and all test results, analyses, and copies of the inspector's original field notes, and a certification as described in the Standard Provisions and Reporting Requirements.

2. WMUs 6E through 6H and 7I through 7P shall be constructed with a composite liner system with an underlying leak detection layer and capillary break layer as follows (from top to bottom):
 - Operations layer – Three feet of shredded tires or one foot of soil
 - Geotextile filter layer
 - LCRS - One foot of gravel (or other material that will provide adequate drainage without damage to the geomembrane)
 - Geotextile cushion layer (if puncture calculations indicate one is needed)
 - Geomembrane - 60-mil HDPE geomembrane
 - Compacted clay liner - Two feet of compacted clay ($k \leq 1 \times 10^{-7}$ cm/sec)
 - Groundwater separation layer- Three feet of compacted earthfill
 - Leak detection layer- Geocomposite drainage layer
 - Capillary break layer- 40-mil HDPE geomembrane liner
3. The required Final Design Report shall include calculations for geomembrane puncture by the overlying LCRS layer and propose a geotextile cushion of appropriate thickness if needed. The Final Design Report shall also account for the ultimate settlement of the underlying native clay with regard to maintaining separation of waste from groundwater, integrity of the liner system, and integrity of the LCRS piping including the riser pipes at the sump.
4. WMUs 6 and 7 shall be equipped with in-fill landfill gas extraction systems and landfill gas shall also be removed from the primary LCRS when methane is present at levels of 30 percent or greater.
5. The Discharger shall design the liner grading plan for WMUs 6E through 6H and 7I through 7P to ensure five feet of groundwater separation is maintained between the primary geomembrane and the capillary break layer after ultimate subgrade settlement without groundwater exerting an upward force on the capillary break layer.
6. All WMU containment structures shall meet the general criteria set forth in Section 20320 of Title 27.
7. The Discharger may propose changes to the liner system design prior to construction, provided that approved components are not eliminated, the engineering properties of

the components are not substantially reduced, and the proposed liner system results in the protection of water quality equal to or greater than the design prescribed by Title 27 and this Order. The proposed changes may be made following approval by the Executive Officer. Substantive changes to the design require reevaluation as an engineered alternative and approval by the Regional Water Board.

8. Construction shall proceed only after all applicable construction quality assurance plans have been approved.
9. Following the completion of construction of a Unit or portion of a Unit, and prior to discharge onto the newly constructed liner system, the final documentation required in Title 27 CCR Section 20324(d)(1)(C) shall be submitted for review and approval. The report shall be certified by a California registered civil engineer or a certified engineering geologist. It shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, and with the prescriptive standards and performance goals of Title 27.
10. A third party independent of both the Discharger and the construction contractor shall perform all of the construction quality assurance monitoring and testing during the construction of a liner system.
11. LCRSs shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by the WMU and to prevent the buildup of hydraulic head on the underlying liner at any time. The depth of fluid in any LCRS sump shall be kept at or below the minimum needed to ensure efficient pump operation.
12. Leachate generation by a landfill unit shall not exceed 85% of the design capacity of the sump pump. If leachate generation exceeds this value or if the depth of fluid in an LCRS exceeds the minimum needed for efficient pump operations, then the Discharger shall immediately cease the discharge of sludges, leachate, and other high-moisture wastes to the landfill unit and shall notify the Regional Water Board in writing within seven days. Notification shall include a timetable for corrective action necessary to reduce leachate production.
13. If monitoring reveals substantial or progressive increases of leachate generation above the design leachate flow volume for the landfill module, such that the depth of fluid on any portion of the LCRS (excluding the leachate removal pump sump) exceeds 30 cm, the Discharger shall immediately notify Regional Water Board staff by telephone, and shall follow up the notification in writing within seven days. The notification shall include a timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.

14. New landfill units and lateral expansions shall not be located in wetlands unless the Discharger has successfully completed, and the Regional Water Board has approved, all demonstrations required for such discharge under 40 CFR 258.12(a), and the Discharger has completed CEQA, and obtained all necessary permits and a water quality certification.
15. Both active and closure landfill units shall be designed, constructed, and operated to prevent inundation or washout due to floods with a 100-year return period. Class III landfill modules and related containment structures shall be constructed and maintained to prevent, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping under 100-year, 24-hour precipitation conditions.
16. Precipitation and drainage control systems shall be constructed on both active and closure landfill units. They shall be designed and constructed to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 100-year, 24-hour precipitation conditions contained in the Standard Provisions and Reporting Requirements referenced in Provision H.4 below.
17. Precipitation and drainage control systems for Class II surface impoundments shall be designed, constructed, and maintained to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 1,000-year, 24-hour precipitation conditions.
18. The design capacity of Class II surface impoundments shall accommodate rainfall and leachate produced from a 1,000-year, 24-hour precipitation event, and the 100-year wet season precipitation while maintaining the required two feet of freeboard at all times.

E. CLOSURE SPECIFICATIONS

Closure of WMUs 1 through 5

1. WMUs 1 through 5 shall be incrementally closed in accordance with the Final Closure Plan for these units and shall receive a final cover in accordance with the prescriptive standards of Title 27 and Subtitle D, or the EAD described in Finding No. 75.
2. For the prescriptive cover (Option 1), the low hydraulic conductivity layer for WMUs 1 through 4 shall have a maximum hydraulic conductivity of 1×10^{-6} cm/sec and a minimum relative compaction of 90%. The low hydraulic conductivity layer for WMU 5 shall have a maximum hydraulic conductivity of 1×10^{-6} cm/sec, or equal to the permeability of the underlying clay liner, whichever is less. Hydraulic conductivities of cap materials shall be determined by laboratory tests using water. As part of final design, the Discharger shall demonstrate that use of a clay-only cover will meet the

Title 27 performance standards given the potential for desiccation cracking of the clay layer.

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

3. The closure schedule for WMUs 1 through 5 shall be as follows:

Closure Schedule for WMUs 1-5		
WMUs to be Closed	Date to Complete Filling	Date to Complete Closure Construction
WMU 1/2 ¹	2011	2012
WMU 3	2006	2007
WMU 4/5 ¹	2013	2014

¹ WMUs 1 & 2 and 4 & 5 will be filled as single units.

Closure of WMUs 6 and 7

4. WMUs 6 & 7 shall be incrementally closed in accordance with the Preliminary Closure Plan for these units. Each module shall receive a final cover in accordance with the design described in Finding No. 79.

Closure of All Landfill WMUs

5. The WMU slopes shall not exceed a horizontal-to-vertical ratio of 3:1, and shall have at least one 15-foot wide bench for every 50 feet of exterior side-slope rise. WMU closure designs for side-slopes shall be supported by a Slope and Foundation Stability Report (SFSR), prepared by a California registered civil engineer or certified engineering geologist per Section 21750(f)(5) of Title 27 and approved by Regional Water Board staff. Other areas with slopes greater than ten percent, surface drainage courses, and areas subject to erosion by wind or water shall be designed and constructed to prevent such erosion. The SFRS may be included in the FCP and/or the design report for closure of each landfill or landfill module.
6. Vegetation shall be planted and maintained over each closed landfill module. Vegetation shall be selected to require a minimum of irrigation and maintenance and shall have a rooting depth not in excess of the vegetative layer thickness.
7. At closure, landfill final slopes shall not be less than five percent (5%) and shall be maintained at no less than three percent (3%) grade during the post-closure maintenance period to prevent ponding and infiltration.

8. Select waste shall be placed within the final two feet of the landfill mass to prevent materials from penetrating the interim cover and cover system foundation soil layer.
9. The landfill gas extraction system shall remain operational throughout post-closure maintenance period to ensure that gases do not build up under the cover potentially causing uplift, instability of the cover, and development of excess condensation.
10. Vegetation shall be planted and maintained over each closed landfill module. Vegetation shall be selected to require a minimum of irrigation and maintenance and for composite final covers, shall have a rooting depth not in excess of the vegetative layer thickness.
11. Landfill units shall be closed in accordance with an approved Partial Final Closure Plan or Final Closure Plan meeting the requirements of Title 27, Subtitle D, and this Order.

Closure of Surface Impoundments

12. The closure of each surface impoundment shall be under the direct supervision of a California registered civil engineer or certified engineering geologist.
13. At closure of surface impoundments, all residual wastes, including liquids, sludges, precipitates, settled solids, and liner materials and adjacent natural geologic materials contaminated by wastes, shall be completely removed and discharged to a waste management unit approved by Regional Water Board staff. If after reasonable attempts, the Discharger demonstrates the removal of all remaining contamination is infeasible, the impoundment shall be closed as a landfill.

F. POST-CLOSURE MAINTENANCE SPECIFICATIONS

1. As specified in the Final Post-Closure Maintenance Plan (FPCMP) for WMUs 1-5 and the Preliminary Post-Closure Maintenance Plan (PPCMP) for WMUs 6 & 7, the Discharger shall conduct monitoring of the following during the post-closure maintenance period:
 - a. Final cover monitoring;
 - b. Settlement monitoring;
 - c. Surface water monitoring and control;
 - d. Leachate collection and removal system monitoring;
 - e. Landfill gas monitoring and control;
 - f. Groundwater monitoring and control;
 - g. Air stripper effluent monitoring and control; and
 - h. Vadose zone monitoring.

This monitoring shall be conducted in accordance with the FPCMP and PPCMP, this Order and the attached MRP, and any other Orders issued by the Regional Water

Board for these items. In the event of a conflict between a Regional Water Board Order and the FPCMP or PPCMP, the requirements of the Regional Water Board Order shall prevail.

2. The Discharger shall conduct visual inspections the final cover of any closed landfill unit at least **quarterly** to check for evidence of settlement, erosion, ponded water, odor, exposed waste, exposed geomembrane, cracks, slope failure, leachate seeps, or damage to vegetation. More frequent inspections shall be conducted during the wet season as necessary. Areas of the final cover showing evidence of any of the problems described above shall be repaired in a timely manner, and the cause shall be investigated to prevent recurrences of the problem(s). Inspections conducted during the late summer or fall shall be coordinated with the Winterization requirements in Facility Specification C.14, above.
3. The Discharger shall, in a timely manner, repair any areas of the final cover that have been damaged by erosion, cracking, differential settlement, subsidence or any other causes that could allow ponding of surface water or percolation of surface water into the wastes.
4. Closed landfill units shall be graded and maintained at least a three percent (3%) grade to prevent ponding.
5. The Discharger shall inspect, monitor, and maintain closed landfill units in accordance with the applicable Partial Final Post-Closure Maintenance Plan or Final Post-Closure Maintenance Plan.

G. DETECTION MONITORING SPECIFICATIONS

1. The Discharger shall submit for review and approval a groundwater detection monitoring program demonstrating compliance with Title 27 for any Unit expansion.
2. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with Monitoring and Reporting Program No. R5-2007-0180. A detection monitoring program for a new Unit shall be installed, operational, and one year of monitoring data collected prior to the discharge of wastes [Title 27 CCR Section 20415(e)(6)].
3. The Discharger shall provide Regional Water Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation, repair, or abandonment of monitoring devices, and a minimum 48 hour notification prior to the semiannual groundwater sampling event associated with a detection monitoring program, evaluation monitoring program, or corrective action program.

4. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, Monitoring and Reporting Program No. R5-2007-0180, and the Standard Provisions and Reporting Requirements, dated April 2000.
5. 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 (i.e., US-EPA methods 8260 and 8270). The repeated detection of one or more non-naturally occurring organic compounds in samples above the Water Quality Protection Standard from detection monitoring wells is evidence of a release from the Unit.
6. The concentrations of the constituents of concern in waters passing the Point of Compliance shall not exceed the concentration limits established pursuant to Monitoring and Reporting Program No. R5-2007-0180.
7. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in Monitoring and Reporting Program No. R5-2007-0180 and Title 27 CCR Section 20415(e).
8. The Discharger shall maintain an approved Sample Collection and Analysis Plan (currently contained in Appendix C of the March 1994 *Water Quality Monitoring 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; and
 - e. Chain of Custody control.
9. 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.

10. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology shall be submitted for review and approval prior to use.
11. 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 method detection limit (MDL) shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
12. **"Trace" results** - results falling between the MDL and the practical quantitation limit (PQL) - shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run.
13. **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.
14. 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 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.
15. 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 qualifications of the person(s) performing the analyses. 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.

16. 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.
17. 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 CCR 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 for routine laboratory operating conditions that are available to the facility. The Discharger's technical report, pursuant to Title 27 CCR 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 nonstatistical 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".
18. 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). The Discharger may propose an alternate statistical method [to the methods listed under Title 27 CCR Section 20415(e)(8)(A-D)] in accordance with Title 27 CCR Section 20415(e)(8)(E), for review and approval.
19. The Discharger may propose an alternate statistical method [to the methods listed under Title 27 CCR Section 20415(e)(8)(A-D)] in accordance with Title 27 CCR Section 20415(e)(8)(E), for review and approval. Upon receiving written approval, 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). Nevertheless, analytical results involving detection of these analytes in any background or downgradient

sample shall be reported and flagged for easy reference by Regional Water Board staff.

20. 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. From the constituent of concern or monitoring parameter list, identify each analyte in the **current** sample that exceeds either its respective MDL or PQL. 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 are detected in less than 10% of background samples 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 CCR Section 20415(e)(8)(E)]:
 - 1) In the event that the Discharger concludes (pursuant to paragraph 20.a., above) that there is a preliminary indication of a release, then the Discharger shall immediately notify Regional 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.
 - 2) For any given retest sample, the Discharger shall include, in the retest analysis, **only the laboratory analytical results for those analytes detected in the original sample**. As soon as the retest data are available, the Discharger shall conclude that there is measurably significant evidence of a release if two or more analytes equal or exceed their respective MDLs or if one or more analyte equals or exceeds its PQL and shall:
 - a) **Immediately** notify the Regional Water Board about any constituent or constituents verified to be present at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of validation; and
 - b) Comply with ¶21, below if any constituent or constituents were verified to be present.
 - 3) Any analyte that is confirmed per this method shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event.

21. If the Discharger determines that there is measurably significant evidence of a release from the Unit at any monitoring point, the Discharger shall **immediately** implement the requirements of **XI. Response To A Release, C. Release Has Been Verified**, contained in the Standard Provisions and Reporting Requirements.

H. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 and 40 Code of Federal Regulations Part 258 (Subtitle D) that are not specifically referred to in this Order.
3. The Discharger shall comply with Monitoring and Reporting Program No. R5-2007-0180, which is incorporated into and made part of this Order.
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 Title 27 and/or Subtitle D (Title 27 CCR Section 20005 et seq. and 40 CFR 258 et seq.), dated April 2000, which are hereby incorporated into this Order.
5. 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 Regional 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.
6. 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 Regional 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.”
7. 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.
 8. 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 Unit(s) and during subsequent use of the property for other purposes.
 9. 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 the Order.
 10. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Regional 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 Regional Water Board, and a statement. The statement shall comply with the signatory requirements contained in Provision H.6 and state that the new owner or operator assumes full responsibility for compliance with this Order.

Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer of this Order shall be approved or disapproved by the Regional Water Board.

11. The Discharger shall maintain assurances of financial responsibility for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill in the amount of the approved cost estimate. If conditions change such that a new cost estimate is needed, the Discharger shall submit a new cost estimate for review and approval and submit the approved cost estimate and proposed financial assurance mechanism meeting the requirements of Chapter 6, Title 27 to the Financial Assurances Section of the California Integrated Waste Management Board (CIWMB). If the CIWMB 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 for at least the amount of the approved cost estimate.
12. The Discharger shall update the preliminary closure and post-closure maintenance plan (PCPMP) any time there is a change that will increase the amount of the closure and post-closure maintenance cost estimate. The updated PCPMP shall be submitted to the Regional Water Board, the Local Enforcement Agency, and the CIWMB. The PCPMP shall meet the requirements of Title 27 CCR 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. A final (or partial final) closure and post-closure maintenance plan shall be submitted prior to closure and closure shall not be conducted in the absence of closure WDRs.
13. The Discharger shall maintain assurances of financial responsibility for closure and post-closure maintenance costs in the amount of the cost estimates in the approved preliminary or final closure and post-closure maintenance plan, as applicable. If conditions change such that a new cost estimate is needed, the Discharger shall include a new cost estimate in the next required update of the PCPMP for review and approval meeting the requirements of Chapter 6, Title 27, and shall establish coverage for the new amount with the CIWMB.
14. The Discharger shall complete the tasks contained in these waste discharge requirements in accordance with the following time schedule:

<u>Task</u>	<u>Compliance Date</u>
A. Construction Plans	
Submit construction and design plans for review and approval. (see Construction Specification D.1)	At least 60 days prior to construction
B. Construction Report	
Submit a construction report for review and approval upon completion demonstrating construction was in accordance with approved construction plans. (see Construction Specification D.9)	At least 30 days prior to discharge

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 6 December 2007.

PAMELA C. CREEDON, Executive Officer

WLB: 12/6/2007

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2007-0180
FOR
COUNTY OF YOLO
PLANNING AND PUBLIC WORKS DEPARTMENT
YOLO COUNTY CENTRAL LANDFILL
CLASS III LANDFILLS & CLASS II SURFACE IMPOUNDMENTS
CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE MAINTENANCE,
AND CORRECTIVE ACTION
YOLO COUNTY

The Discharger shall maintain water quality monitoring systems that are appropriate for detection monitoring and corrective action, and that comply with Subchapter 3, Chapter 3, Subdivision 1, Division 2, Title 27, CCR, and any other applicable provisions therein.

Compliance with this Monitoring and Reporting Program, and with the companion Standard Provisions and Reporting Requirements dated April 2000, is ordered by Waste Discharge Requirements (WDRs) Order No. R5-2007-0180. Failure to comply with this Program, or with the Standard Provisions and Reporting Requirements, constitutes non-compliance with the WDRs and with Division 7 of the Water Code, which can result in the imposition of civil monetary liability.

This MRP contains the following sections:

- I. MONITORING PROGRAMS
- II. DETECTION MONITORING
- III. CORRECTIVE ACTION MONITORING
- IV. WATER QUALITY PROTECTION STANDARD
- V. REPORTING
- VI. NOTIFICATION AND RESPONSE TO A RELEASE

I. MONITORING PROGRAMS

A. SOLID WASTE MONITORING

The Discharger shall monitor and report all wastes discharged to each WMU on a monthly basis as follows:

Nonhazardous Solid Waste Monitoring

<u>Parameter</u>	<u>Units</u>	<u>Reporting Frequency</u>
Source(s) of material discharged		Semi-annually
Maximum discharge elevation	MSL feet & tenths	Semi-annually
Results of Load Checking Program	---	Semi-annually
Quantity discharged	Cubic yards or tons	Semi-annually

<u>Parameter</u>	<u>Units</u>	<u>Reporting Frequency</u>
Type of material discharged	---	Semi-annually
Capacity of landfill/module remaining	Percent	Annually

Liquid and Semi-solid Waste Monitoring

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

<u>Parameter</u>	<u>Units</u>	<u>Reporting Frequency</u>
Quantity discharged	gallons, cubic yards or tons	Semi-annually
Type of liquid discharged	---	Semi-annually
Capacity remaining	Percent/gallons	Semi-annually
Source of material discharged	---	Semi-annually
Minimum freeboard	Feet & tenths	Semi-annually

B. CONSTITUENTS OF CONCERN

Except as otherwise indicated in this Order, the Discharger shall monitor each media of each new and existing landfill module for applicable Constituents of Concern (per Subtitle D/State Water Resources Control Board Resolution 93-62). The monitoring locations, analytical methods, and frequency of analysis are as follows:

1. Monitoring Locations

- a. Leachate – As specified in Section I.C.1 of this MRP.
- b. Unsaturated zone
 - i) pore fluid - lysimeters for monitoring each WMU, as identified in Section II.B.1 of this MRP.
- c. Groundwater - all monitoring wells screened in each location as follows:
 - i) each aquifer zone (shallow and deep) down gradient of each WMU or contiguous landfill WMUs
 - ii) upgradient background wells for each WMU or WMU group

2. Monitoring Schedule

CONSTITUENTS OF CONCERN MONITORING

<u>Constituents of Concern</u> ¹	<u>Units</u>	<u>Frequency</u>
Carbonate	mg/l	Every 5 years ²
Inorganics (dissolved)	mg/l	Every 5 years ²
Volatile Organic Compounds (EPA Method 8260B)	µg/l	Every 5 years ²
Semi-Volatile Organic Compounds (EPA Method 8270B)	µg/l	Every 5 years ²
Organochlorine Pesticides (EPA Method 8081A)	µg/l	Every 5 years ²
PCBs (EPA Method 8082)	µg/l	Every 5 years ²
Chlorophenoxy Herbicides (EPA Method 8151)	µg/l	Every 5 years ²
Organophosphorus Pesticides (EPA Method 8141A)	µg/l	Every 5 years ²

1. The constituent-by-constituent listings for each of the above groups are included in Attachment F which accompanies this Order.
2. Except for leachate which shall be monitored for COCs annually (see Section I.C.2 of this MRP).

C. LEACHATE MONITORING

1. Monitoring Locations

The leachate monitoring locations shall be as follows:

LEACHATE MONITORING LOCATIONS			
WMU	Module	Impoundment	Monitoring Location
1, 2, 3, 4, 5	---	---	LPS1
6	A, B, C	---	LPS2
6	B	---	LPS2, CEC-SC ¹
6	D (Phase 1)	---	6D1-E-LS, 6D1-W-LS
6	D (Phase 2)	---	6D2-E-LS, 6D2-W-LS
6	D - bioreactors		Pressure transducers ²
G	---	G	G-LD
H	---	H1, H2, H3	H1-LD, H2-LD, H3-E-LD, H3-W-LD

1. "CEC-SC was formerly called "CEC-LYS", and as described in the *In the Amended Report of Waste Discharge Proposing a Corrective Action Program for WMU 6B, 6C, and G submitted to the RWQCB on March 26, 2004*, this was an incorrect naming of this monitoring point since it does not actually monitor the vadose zone under WMU 6B, but is a secondary containment for the CEC Enhanced Control Cell.
2. Includes pressure transducers in LCRS trenches and on geocomposite drainage layer.

2. Monitoring Schedule

Leachate monitoring shall be conducted as follows:

LEACHATE AND UNSATURATED ZONE MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
<i>Field Parameters</i>		
Flow Rate ¹	Gallons/day	Monthly
Volume	Gallons	Monthly
Specific Conductance	µmhos/cm	Monthly
pH	pH units	Monthly
Hydraulic head ²	ft	continuously
<i>Monitoring Parameters</i> ³		
Ammonia as N	mg/l	Semi-annually
Bicarbonate	mg/l	Semi-annually
Chloride	mg/l	Semi-annually
Nitrate	mg/l	Semi-annually
Sulfates	mg/l	Semi-annually
Total Alkalinity	mg/l	Semi-annually
Total Kjeldahl Nitrogen	mg/l	Semi-annually
Total Dissolved Solids (TDS)	mg/l	Semi-annually
Inorganics (dissolved)	mg/l	Annually
Volatile Organic Compounds	µg/l	Semi-annually
<i>Constituents of Concern</i>		
Section I.B.2 constituents ^{1, 4}	Varies, see Section I.B.2 of this MRP	Annually

1. Leachate monitoring only.

2. Module D bioreactors only.

3. The constituent-by-constituent listing for Monitoring Parameters is included in Attachment E, which accompanies this Order.

4. The constituent-by-constituent listing for Constituents of Concern is included in Attachment F, which accompanies this Order.

Upon detection of leachate in a previously dry sump or pump station, the leachate shall be sampled in accordance with the above schedule and the results included in the monitoring report.

All visible portions of synthetic liners shall be inspected on a monthly basis. If, during the active life of the impoundment, the wastes are removed and the impoundment is cleaned down to the liner, an inspection shall be made of the bottom liner prior to refilling of the impoundment.

Each landfill and surface impoundment LCRS shall be hydraulically tested annually to

demonstrate that it is still operating in conformance with the WDRs (i.e., no clogging, collapse, or reduced drainage capacity). The results shall be reported to the Regional Board in the annual report and include comparison with earlier tests made under comparable conditions.

D. GROUNDWATER ELEVATION MONITORING

The ground water surface elevation (in feet and hundredths, MSL) in all wells and piezometers shall be measured on a quarterly basis and used to determine the gradient and direction of ground water flow. Groundwater elevations taken prior to purging the well and sampling for Monitoring Parameters may be used to fulfill this requirement. Groundwater elevations for all up-gradient and down-gradient wells for a given groundwater body shall be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater gradient and direction. This information shall be included in the semi-annual monitoring reports. The results of ground water elevation monitoring shall be displayed on a water table contour map and/or ground water flow net for the site and submitted with the semi-annual monitoring reports.

II. DETECTION MONITORING

A. GENERAL

The Discharger shall perform Detection Monitoring on all media potentially affected by a release, including surface water, groundwater, and the unsaturated zone. For any given monitored medium, a sufficient number of samples shall be taken from all Monitoring Points and Background Monitoring Points to satisfy the data analysis requirements for a given Reporting Period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible.

The Discharger shall use a Regional Board-approved statistical (or non-statistical) procedure to determine whether there has been a measurably significant increase in a constituent over the water quality protection standard, as set forth in Section 20415(e)(7) of Title 27.

B. UNSATURATED ZONE

Unsaturated zone monitoring devices shall be checked monthly for fluid and monitoring shall include the volume of fluid recovered. The monitoring locations shall be as follows:

1. Monitoring Locations

WMUs 1 through 6A were constructed before 1992 and do not have unsaturated zone monitoring. Further, WMUs 1 through 5 are in corrective action. The unsaturated zone monitoring for the remaining WMUs consists of pan and vacuum lysimeters placed in the subgrade of each landfill unit and surface impoundment. The

unsaturated zone monitoring points shall be as listed below (and as shown in Attachment C):

<u>WMU</u>	<u>Lysimeter</u>
6A	---
6B ¹	6B-N-LYS, 6B-S-LYS
6C ²	6C-N-LYS, 6C-S-LYS
6D ³	6D1-E-LYS, 6D1-W-LYS (Phase 1) 6D2-E-LYS, 6D2-W-LYS (Phase 2)
G ⁴	G-LYS-1, G-LYS-2, and G-LYS-3
H1 ⁴	H1-LYS
H2 ⁴	H2-LYS
H3 ⁴	H3-E-LYS and H3-W-LYS

1. Module B has strip drains consisting of geomembrane, geonet and geotextile from bottom to top, underneath the northern and southern LCRS trenches (which connect directly to the trunk line on the eastern perimeter of the module). The strip drains direct flow to separate pan lysimeter manholes on the eastern side of the module (north and south half). The northern pan lysimeter manhole also services the strip drains under the two LCRS trenches for the pilot bioreactor cells.
2. Module C has vacuum lysimeters above the capillary break on the northern and southern half. The vacuum lysimeters are accessed by riser pipe which extends up the slope of the perimeter berm. Lysimeter 6C-S-LYS has been moved from detection monitoring to corrective action monitoring due to the confirmed presence of VOCs in this lysimeter as stated in the WDRs.
3. Module D, phase 1 capillary fringe break covers the entire unit, but has strip drains consisting of geonet covered with geotextile under the LCRS trenches and in several locations in "dendritic" format draining towards the low points of the liner, which are under the LCRS trenches and drain north to south. Module D, phase 2 capillary fringe break covers the entire cell and has a blanket geocomposite over the entire unit draining towards the low points in the liner, which are under the LCRS trenches and drain north to south. Both Module D, phase 1 and phase 2 have pan lysimeters located at the southern perimeter of unit, which are part of the capillary fringe break liner, and into which the strip drains and blanket geocomposite (respectively) drain.
4. Vacuum lysimeters were installed underneath the sumps of each surface impoundment and are accessed by riser pipe which extends up the slope of the perimeter berms.

If liquid is detected in a lysimeter that has always been dry, a sample shall be collected immediately and analyzed for the monitoring parameters listed in Section I.C.2 of this MRP. Lysimeters shall constitute the "points of compliance" with respect to soil-pore liquid.

2. Monitoring Schedule

The monitoring schedule for unsaturated zone monitoring shall be the same as that for leachate monitoring in Section I.C.2 of this MRP.

C. GROUNDWATER

1. Monitoring Locations

WMUs 1 through 5 and G are in corrective action. The groundwater detection monitoring points for WMUs 6 and H, shown in Attachment D, are as follows:

Ground Water Detection Monitoring Locations

<u>WMU</u>	<u>Aquifer</u>	<u>Monitoring Method</u> ⁴	<u>Background</u>	<u>Detection</u> ¹
6 A ²	shallow	Intrawell	OW10, LTPZA,	EW10, EW16 ³
B	shallow	Intrawell	LTPZB, OW10	EW10, EW16 ³
C	shallow	Intrawell	LTPZC, OW15	EW10, EW16 ³
D	shallow	Intrawell	LTPZD, OW14, OW23	EW10, EW16 ³
H	shallow	Intrawell	SIMW5, OW14, OW17	OW23, SIMW4

1. Gradient created by line of extraction wells used for detection monitoring
2. All four modules (A, B, C, and D) are contiguous
3. Wells used for de-watering only (not part of corrective action system).
4. Intrawell analysis was approved by Regional Board staff following a demonstration made by the Discharger in the First Semester 2003 Monitoring Report.

The natural gradient cannot be used as the reference gradient for detection monitoring purposes because the WMUs are within the influence of the extraction system. The gradient created by the extraction system, which runs from southeast to northwest, is therefore used instead.

2. Monitoring Schedule - The analytes and frequency of groundwater monitoring is as follows:

GROUNDWATER MONITORING PROGRAM¹

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
<i>Field Parameters</i>		
Temperature	°C	Semi-annually
Groundwater Elevation	Feet & hundreths, MSL	Semi-annually
Turbidity	Turbidity units	Semi-annually
Specific Conductance	µmhos/cm	Semi-annually
pH	pH units	Semi-annually
<i>Monitoring Parameters</i> ¹		
Ammonia, as N	mg/l	Semi-annually
Bicarbonate	mg/l	Semi-annually
Chlorides	mg/l	Semi-annually
Nitrate	mg/l	Semi-annually
Sulfates	mg/l	Semi-annually
Total Alkalinity	mg/l	Semi-annually
Total Kjeldahl Nitrogen	mg/l	Semi-annually
TDS	mg/l	Semi-annually
Inorganics (dissolved)	mg/l	Annually
VOCs	µg/l	Semi-annually

*Constituents of Concern*²

Section I.B.2
 constituents $\mu\text{g/l}$

Every 5 years

1. The constituent-by-constituent listing for Monitoring Parameters is included in Attachment E, which accompanies this Order.
2. The constituent-by-constituent listing for Constituents of Concern is included in Attachment F, which accompanies this Order.

D. SURFACE WATER

1. Monitoring Locations

The Discharger shall monitor surface water at the locations where surface water flows offsite from the landfill facility designated as SWP1, SWP2, SWP3, and SWP4, as shown on Attachment D.

2. Monitoring Schedule

The monitoring schedule for surface water shall be the same as for groundwater as specified in Section II.2.C of this MRP, with the exception of "Groundwater Elevation" which does not apply.

III. CORRECTIVE ACTION

A. GROUNDWATER EXTRACTION

Groundwater extraction is conducted for the purpose of both corrective action and de-watering to maintain separation from the base of the modules. The extraction well network, shown in Attachment D, is as follows:

GROUNDWATER EXTRACTION WELLS			
<u>WMU</u>	<u>Aquifer</u>	<u>Purpose</u>	<u>Extraction Wells</u>
1	Shallow	corrective action	EWs 1 through 8
2	Shallow	corrective action	EWs 1 through 8
3	Shallow	corrective action	EWs 1 through 8
4	Shallow	corrective action	EWs 1 through 8
5	Shallow	corrective action and de-watering	EWs 1 through 8
6	Shallow	de-watering	EWs 9 through 16

B. CORRECTIVE ACTION MONITORING

1. Monitoring Locations

The corrective action monitoring points, shown in Attachment D, are as follows:

Corrective Action Monitoring Locations					
<u>Source Area</u>	<u>Monitoring Method</u>	<u>Background Wells</u>	<u>Shallow Wells</u>	<u>Deep Wells</u>	<u>Lysimeter</u>
WMU 1, 2	Intrawell ¹	OW1, OW4, OW5	OW17, OW18, OW21	PZ1, DW1, DW2	N/A
WMU 3	Intrawell	OW5, OW6	OW26, OW27	DW6	N/A
WMU 4, 5	Intrawell	OW7, OW24	EW2, EW7	DW7	N/A
WMU 6C	N/A	N/A	N/A	N/A	6C-S-LYS
WMU G ²	Intrawell	SIMW1	OW18, SIMW4	DW2	N/A

1. Each well functions as its own background well.
2. The pond which WMU G replaced was unlined and may have impacted the vadose zone.

As of the Second Semester 2003, the following wells have confirmed detections of VOCs: OW18, OW27, EW2, EW7, DW1, and DW2. The other wells in the corrective action program have had sporadic detections of VOCs but are not considered impacted at this time.

2. Monitoring Schedule

The monitoring schedule for the corrective action wells shall be the same as for detection monitoring (see Section II.C.2).

IV. WATER QUALITY PROTECTION STANDARD

The Water Quality Protection Standard (Standard) consists of the following elements:

- A. Constituents of Concern;
- B. Concentration Limits;
- C. Monitoring Points;
- D. Points of Compliance; and
- E. Compliance Period.

Each of these is described as follows:

A. Constituents of Concern

The 'COC list' (list of Constituents of Concern required under Title 27 shall include all constituents listed in Attachment F. The Discharger shall monitor all COCs every five years, or more frequently as required.

B. Concentration Limits

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

Inorganic Data Evaluation:

Concentration limits for inorganic constituents shall be calculated using either an interwell or intrawell tolerance limit as required in Section II.C.1 and Section III.B.1, above. Parameters not requiring concentration limits include temperature, oxygen reduction potential, turbidity, and dissolved oxygen. The upper tolerance limit shall be used for all constituents and parameters except for pH for which both upper and lower limits shall be calculated.

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

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

Organic Data Evaluation:

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

C. Monitoring Points

The groundwater monitoring points for detection monitoring shall be the monitoring locations listed in Section II.C.1. The unsaturated zone monitoring points shall consist of those lysimeters installed beneath waste management units as listed in Section II.B.1 of this MRP. All detection monitoring points are shown on Attachments C and D.

D. Points of Compliance

The point(s) of compliance at each groundwater monitoring point is the vertical surface located at the downgradient limit of the WMU that extends through the uppermost aquifer underlying the WMU. Since the WMUs are contiguous, these points correspond the corrective action and de-water wells on the northern boundary of the site as listed in Section II.C.1 and Section III.B.1.

E. Compliance Period

The Compliance Period is the number of years equal to the active life of the waste management unit plus the closure period. Each time the Water Quality Protection

Standard is exceeded (i.e., a release is discovered), the landfill begins a Compliance Period on the date the Regional Board directs the Discharger to begin an Evaluation Monitoring Program. If the Discharger's Corrective Action Program (CAP) has not achieved compliance with the Standard by the scheduled end of the Compliance Period, the Compliance Period is automatically extended until the landfill has been in continuous compliance for at least three consecutive years.

V. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in the Standard Provisions and Reporting Requirements. Reports that do not comply with the required format will be rejected and the Discharger shall be deemed to be in noncompliance with the WDRs.

A narrative discussion of the monitoring results, including notations of any water quality violations shall precede tabular summaries of the water quality data. Further, each monitoring report shall include a summary and certification of completion of all Standard Observations for the waste management unit (WMU), for the perimeter of the WMU, and for the receiving waters. The standard observations shall be performed on a weekly basis and shall include those elements as defined in the Standard Provisions and Reporting Requirements.

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. Historical and current monitoring data shall be graphed at least once annually. Graphs for the same constituent shall be plotted at the same scale to facilitate visual comparison of monitoring data. Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those that cannot be quantified and/or specifically identified. Metals shall be analyzed according to the method listed in Attachments E and F.

The results of any monitoring done more frequently than required at the locations specified herein shall be reported to the Regional Board in the monitoring report(s) for that period.

A. MONITORING REPORTS

1. Detection Monitoring Reports

Detection Monitoring Reports (DMRs) shall be prepared and submitted to the Board semi-annually by **31 July** and **31 January** following the end of each calendar semester. The semi-annual report due by 31 January may be included as part of the Annual Report specified in Section V.A.2, below. The reports shall include the results of all monitoring programs listed herein, and include the information required in Section V.B "Reporting Requirements" and Section VI "Notification and Response to a Release", below.

2. Annual Report

An Annual Report, which summarizes the monitoring results for the prior year, shall be submitted to the Regional Board by **31 January** each year. The report shall contain both tabular and graphical summaries of the detection and corrective action monitoring data and a discussion of the progress toward re-establishment of compliance with WDRs and the Water Quality Protection Standard (WQPS). In reporting the progress of corrective action, the report shall include contaminant contour maps for representative volatile organic compounds and inorganic constituents and compare the current plumes with those prior to the start of corrective action. The Annual Report shall be jointly submitted with the second semester Detection Monitoring Report, and shall contain the following:

- a. All monitoring parameters and constituents of concern shall be graphed so as to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot downgradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
- b. All historical monitoring data, including data for the previous year, shall be submitted in tabular form as well as in a digital file format. The Regional Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27 CCR Section 20420(h)], in that this facilitates periodic review by the Regional Water Board.
- c. 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.
- d. A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours.
- e. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.
- f. An evaluation of the effectiveness of the leachate monitoring/control facilities including the results of the annual testing of leachate collection and removal systems required under VIII.P of the Standard Provisions and Reporting Requirements.

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

3. Constituents-of-Concern (COC) Report

The Discharger shall submit reports of the results of ground water monitoring for the Constituents of Concern (COC) every 5 years, or more frequently if required. The ground water monitoring for COC Report shall alternate between the Fall and Spring seasons. The results of COC monitoring shall be submitted with, or reported in, the Annual Report for that year.

B. REPORTING REQUIREMENTS

1. 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 legible records 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.
2. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the

last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report.

3. Each monitoring report shall include a compliance evaluation summary. The summary shall contain at least:
 - a. For each monitoring point and background monitoring point addressed by the report, a description of:
 - 1) The time of water level measurement;
 - 2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
 - 3) The method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;
 - 4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
 - 5) A statement that the sampling procedure was conducted in accordance with the approved Sampling and Analysis Plan.
 - b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
 - c. For each groundwater body, a description and graphical presentation of the gradient and direction of groundwater flow under/around the Unit, and the groundwater flow rate, based upon water level elevations taken prior to the collection of the water quality data submitted in the report.
 - d. Laboratory statements of results of all analyses evaluating compliance with requirements.
 - e. An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities.
 - f. A summary and certification of completion of all **Standard Observations** for the Unit(s), for the perimeter of the Unit, and for the receiving waters. Standard observations for ACTIVE landfill units shall be conducted **weekly** during the wet season (1 October to 30 April) and **monthly** during the dry season (1 May to 30 September). Standard observations for INACTIVE or CLOSED landfill units

shall be conducted **monthly** during the wet season (1 October to 30 April) and **quarterly** during the dry season (1 May to 30 September). Standard The Standard Observations shall include:

- 1) For the Unit:
 - a) Evidence of ponded water at any point on the facility (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
- 2) Along the perimeter of the Unit:
 - a) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
- 3) For receiving waters:
 - a) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
 - b) Discoloration and turbidity - description of color, source, and size of affected area;
 - c) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
 - d) Evidence of water uses - presence of water-associated wildlife;
 - e) Flow rate; and
 - f) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.
 - g) The quantity and types of wastes discharged and the locations in the Unit where waste has been placed since submittal of the last such report.
4. 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 Regional 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 Monitoring Parameters and Constituents of Concern listed in Section I.C.2, and an estimated date that the results will be submitted to the Regional Water Board; and
- e. Corrective measures underway or proposed, and corresponding time schedule.

VI. NOTIFICATION AND RESPONSE TO A RELEASE

A. Notification of Release and Re-test

For any WMU, if the results of a detection monitoring program (DMP) shows that there is a measurably significant increase in an indicator parameter or waste constituents over the WQPS at or beyond the points of compliance (i.e., measurably significant evidence of an exceedance or release), the Discharger shall:

1. immediately notify the Regional Board by telephone, email or fax of the exceedance,
2. within seven days of the initial findings, follow up with written notification by certified mail (or acknowledgment of the Regional Board's finding),
3. within 30 days of the initial finding, re-sample for the constituent(s) or parameter(s) at the point where the standard was exceeded, and
4. within 60 days of the initial finding, submit the results of the re-sampling and statistical analysis, indicating whether or not an exceedance or release was confirmed by the re-test.

B. Existing Release

Within 30 days upon confirmation of an exceedance outside of an existing release, the Discharger shall submit for Regional Board staff approval an amendment to the Corrective Action Program, describing measures planned or taken to contain the release and further corrective action. The Discharger shall also note any necessary changes to the DMP and Corrective Action Monitoring Program monitoring locations as a result of the exceedance (see Section III.B herein).

C. Responding to a Release Discovery

Upon verifying a measurably significant evidence of a release from a WMU according to Section 20420(j) of Title 27 and Section VI.A of this MRP, above, shall **immediately** implement the requirements of **XI. Response To A Release, C. Release Has Been Verified**, contained in the Standard Provisions and Reporting Requirements.

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

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

6 December 2007
(Date)

WLB: 12/6/2007

INFORMATION SHEET

ORDER NO. R5-2007-0180
COUNTY OF YOLO
PLANNING AND PUBLIC WORKS DEPARTMENT
YOLO COUNTY CENTRAL LANDFILL
CLASS III LANDFILLS & CLASS II SURFACE IMPOUNDMENTS
CONSTRUCTION, OPERATION, CLOSURE, POST-CLOSURE MAINTENANCE,
AND CORRECTIVE ACTION
YOLO COUNTY

The County of Yolo, Planning and Public Works Department, (hereafter Discharger) owns and operates the Yolo County Central Landfill, a Class III municipal solid waste (MSW) disposal facility with Class II surface impoundments. The landfill has been in operation since 1975, servicing the incorporated and unincorporated areas of Yolo County. The landfill accepts solid wastes classified as "inert" and "nonhazardous" under Sections 20220 and 20230, Title 27 of the California Code of Regulations (Title 27). Approximately 195,000 tons per year of MSW and other waste are disposed at the site.

Facilities

The waste disposal facilities include six Class III landfills (WMUs 1-6), two Class II surface impoundments (WMUs G and H), and a pilot-scale bioreactor demonstration project. WMUs 1-4 are unlined; WMU 5 is clay-only lined; and WMU 6 contains multiple modules that are compositely lined. Module D of WMU 6 contains a full-scale bioreactor project in cooperation with the Regional Water Board and USEPA under a waiver from liquids restrictions in the Federal regulations. Other landfill facilities include borrow areas for module construction, a ground water extraction and treatment system, storm water drainage ditches and a storm water retention pond, a supply water storage pond, two leachate pump stations, gas extraction facilities, pipelines, and an onsite power plant for co-generation of electricity. Diversion facilities include a metal recycling area, a concrete and asphalt diversion area, a household hazardous waste collection area, and a wood/yard-waste facility.

There are currently 63 ground water monitoring wells at the facility, including 43 shallow observation wells, 15 extraction wells (EWs 1 through 14, and EW16), and five deep wells (DWs-1, 2, 6 and 7, and PZ1). The shallow observation wells are OWs 1 through 28, SIMWs 1, 4, and 5, LPTZs A, B, C, and D, PZs 3 through 7, and DIMWs 1, 2, and 3. As described in the WDRs, the ground water on the western part of the site is impacted by low levels of VOCs from the older landfill units. The detection monitoring program for groundwater at the landfill satisfies the requirements contained in Title 27.

The existing onsite surface water drainage facilities include perimeter ditches at all WMUs and one storm water sedimentation basin. The facility has obtained coverage under the General Industrial Storm Water Permit for storm water discharges. The permit applies to direct storm water discharges and storm water discharges from the sedimentation basin. This Order also requires monitoring of landfill constituents in storm water at a background location and at the locations where runoff leaves the facility.

Leachate Handling

WMUs 1 through 4 are constructed on compacted sub-grade, which has been graded for leachate runoff. A perimeter trench captures leachate runoff from these units and conveys it to a trunk line to Pump Station No. 1. Since the trench is below grade, it may also be capturing ground water when groundwater is high. Since these units are unlined and do not have an LCRS, any leachate that does not runoff to the perimeter drains has the potential to percolate to groundwater and impact groundwater. WMU H is plumbed to Pump Stations No. 1 and 2, and WMU 6D. Leachate from the WMU 6D sumps is directly pumped to the surface impoundment WMU H. The impoundment will be used to store landfill leachate during the wet season and evaporate it during the dry season. The large pond is equipped with spray and drip facilities to enhance evaporation. Pump station No.1 collects leachate from WMUs 1 through 5. Pump Station No. 2 collects leachate from WMU 6A, 6B, and 6C.

Corrective Action

Groundwater on the western part of the site has been impacted by volatile organic compounds (VOCs) from one or more of the older landfill units (WMUs 1 through 5). After installation an air stripper unit in 1993, the Discharger began groundwater pump and treat using existing de-watering wells that were installed between the landfills and a slurry wall to maintain the required groundwater separation from waste. The treated groundwater was formerly discharged to surface water under an NPDES permit but is now discharged to land under separate WDRs due to high boron and selenium concentrations.

Through a recent Evaluation Monitoring Program, the Discharger confirmed a release from WMU 6, Module C in one of the suction lysimeters. In response, the Discharger installed additional landfill gas extraction wells in this module as a corrective action measure to address VOCs detected in the lysimeter.

Bioreactors and Liner System Requirements

As a follow-up to the pilot bioreactor project, the Discharger is operating a full-scale bioreactor demonstration project at WMU6, Module D. The project consists of both anaerobic and aerobic bioreactor cells. Instrumentation is placed in bioreactors to monitor moisture levels and other process parameters. The information is used to adjust liquid injection levels as necessary to stay below the moisture holding capacity of the waste mass.

The Discharger plans to operate existing bioreactor units and future modules to be constructed in WMUs 6 and 7 as bioreactors under the Research, Development, and Demonstration (RD&D) Permits allowed under 40CFR, Part 258.4. This Order provides the requirements for the Discharger to operate bioreactors under the RD&D rule.

These WDRs require that the Discharger not exceed the moisture holding capacity of the landfill, as defined in Title 27, and require that hydraulic head on the liners for the bioreactor units not exceed six inches. The bioreactors utilize a Subtitle D composite liner system, which is underlain by engineered fill to maintain separation from groundwater, and the engineered fill is underlain by a groundwater barrier layer to prevent groundwater from rising above the required separation level. Phase 2 of Module D (and future modules) are also

required to have a drainage layer above the groundwater barrier layer that drains to a pan lysimeter to monitor the entire unsaturated zone beneath the composite liner system. This liner system design was demonstrated by the Discharger to meet the performance standards of Title 27.

WLB: 12/6/2007

WOODLAND



WDRs Order No. R5-2007-0180

DAVIS

Interstate 50

Yolo Bypass

Road 102

Road 104

Road 105

Road 29

Road 28H

Landfill Location

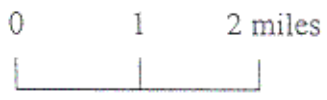
ATTACHMENT A: Location Map

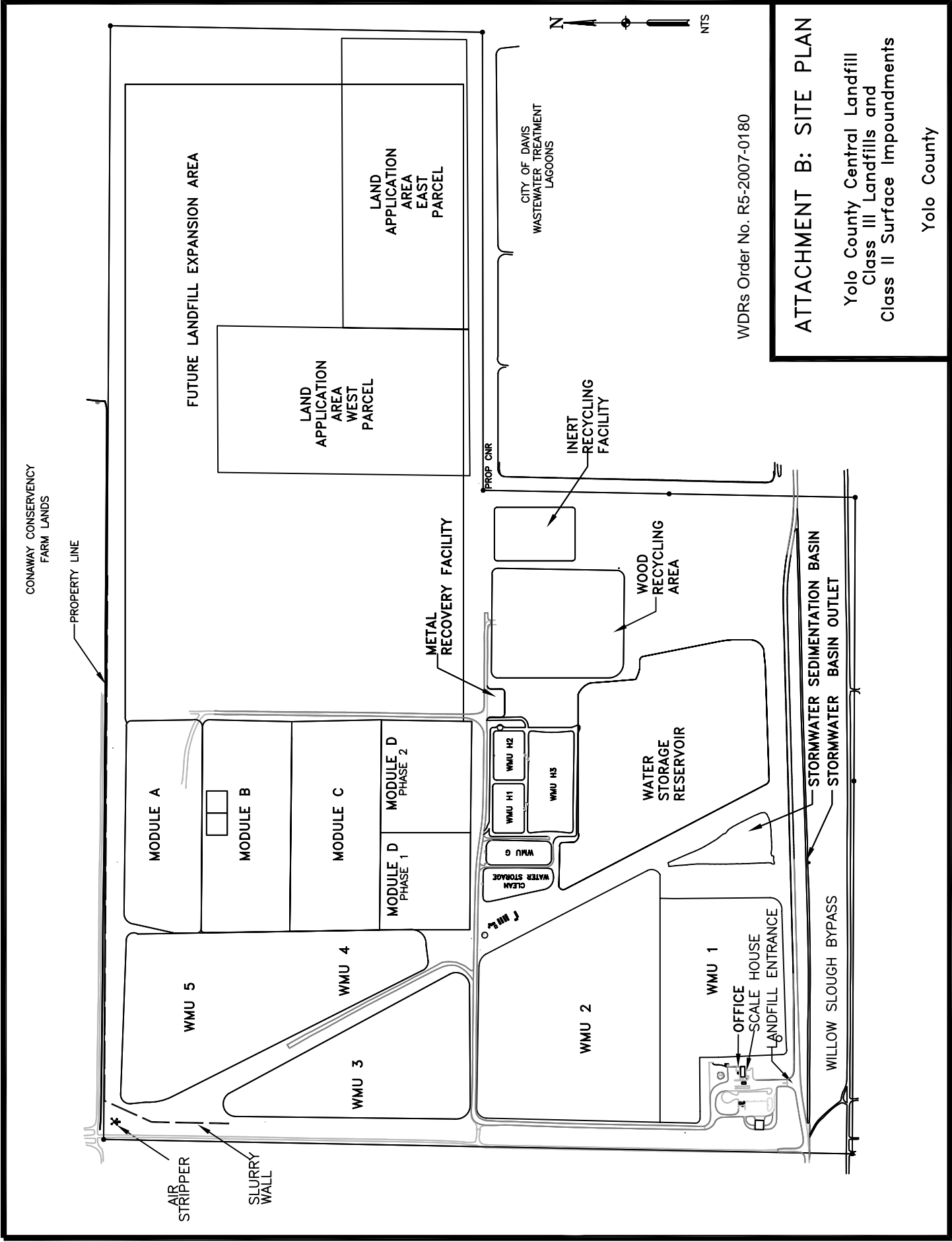
Yolo County Central Landfill
Class III Landfills and
Class II Surface Impoundments



Yolo County

Sections 29&30 T9N, R3E MDB&M

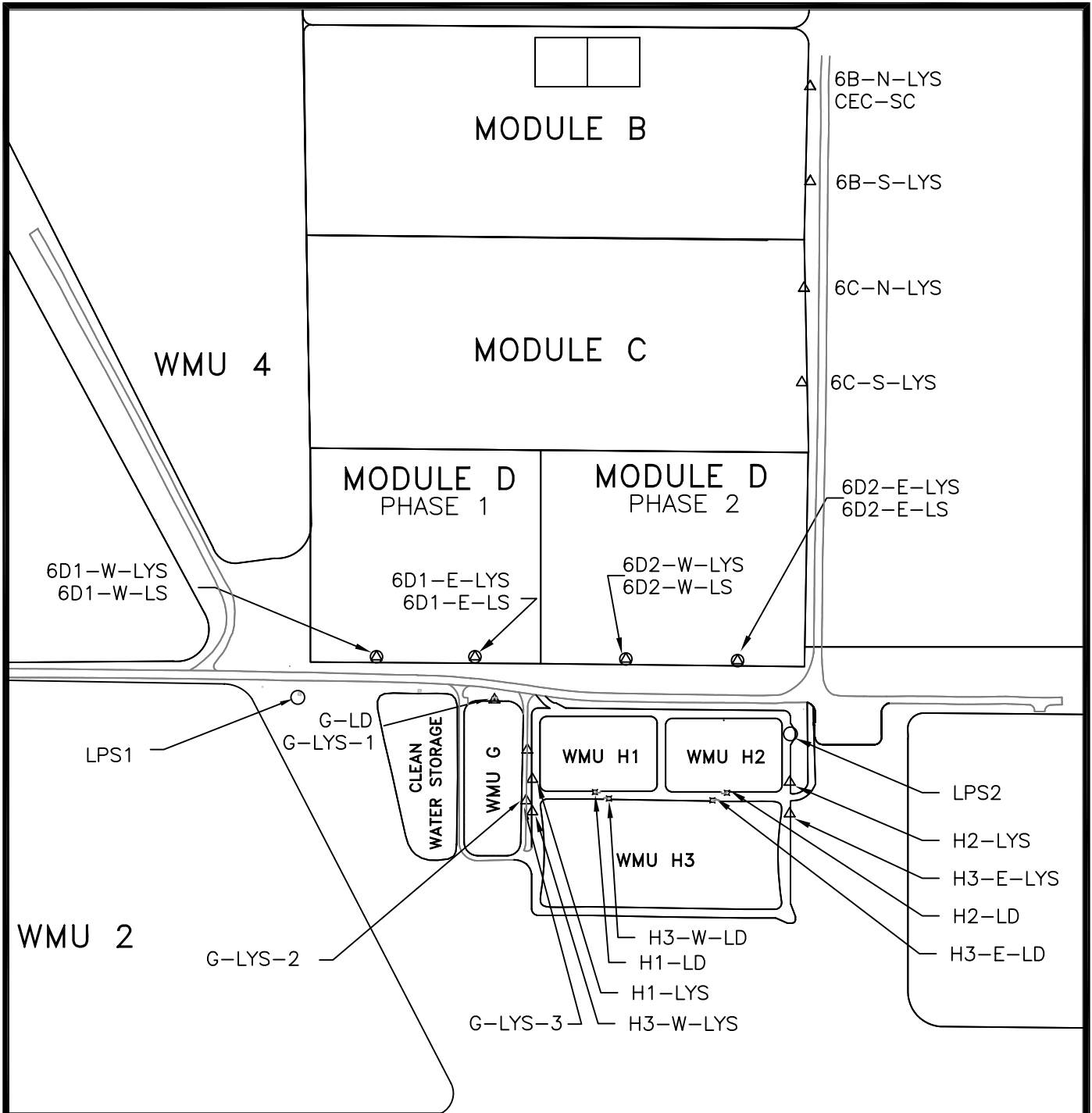




ATTACHMENT B: SITE PLAN

Yolo County Central Landfill
 Class III Landfills and
 Class II Surface Impoundments

Yolo County



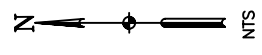
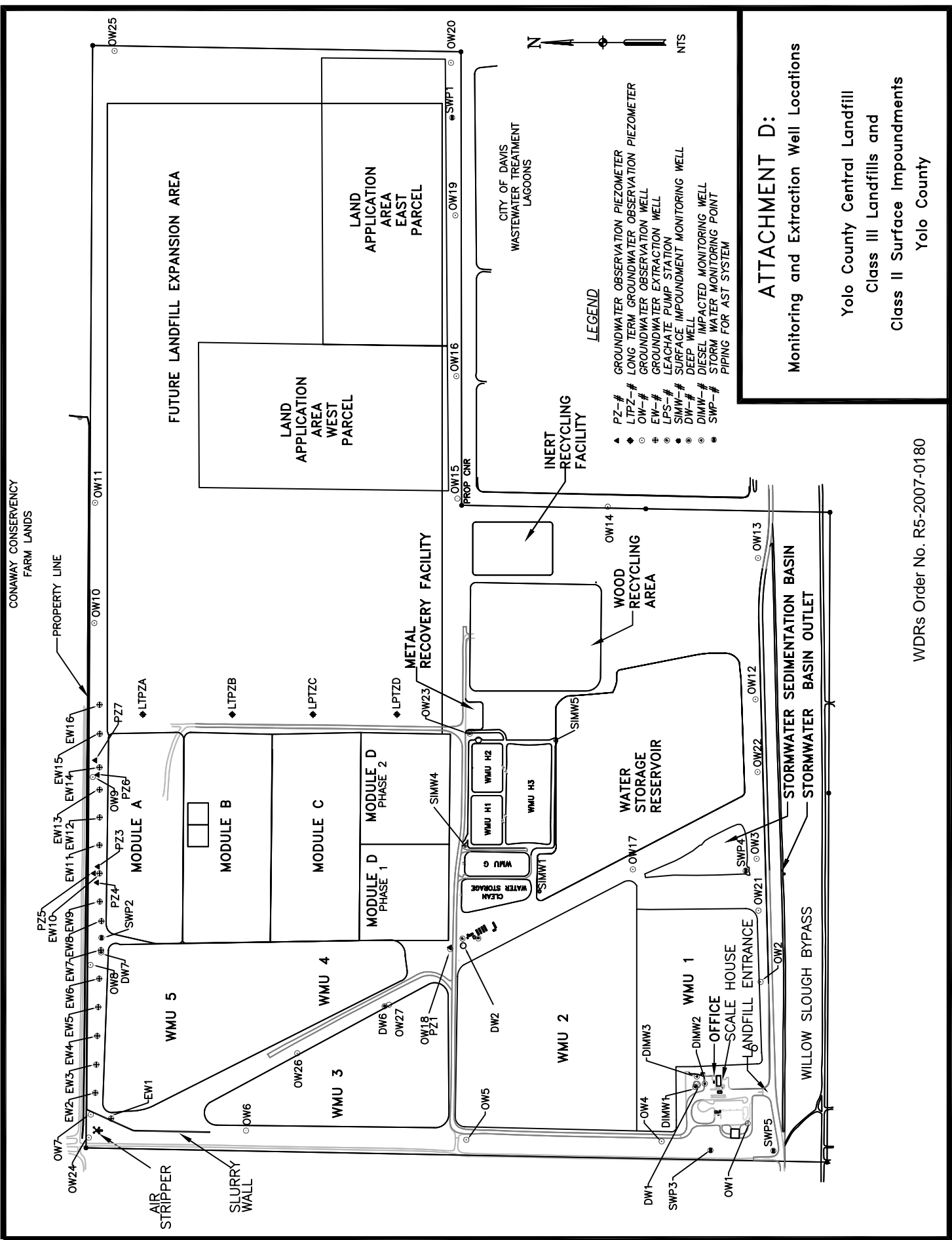
WDRs Order No. R5-2007-0180

LEGEND

- LEAK DETECTION SUMP
- △ LYSIMETER SAMPLING PORT
- LEACHATE SUMP OR PUMP STATION



ATTACHMENT C:
 Lysimeter, Leak Detection,
 and Leachate Sump Locations
 Yolo County Central Landfill
 Class III Landfills and
 Class II Surface Impoundments
 Yolo County



ATTACHMENT D:

Monitoring and Extraction Well Locations

Yolo County Central Landfill
 Class III Landfills and
 Class II Surface Impoundments
 Yolo County

LEGEND

- ▲ PZ-# GROUNDWATER OBSERVATION PIEZOMETER
- ◆ LPTZ-# LONG TERM GROUNDWATER OBSERVATION PIEZOMETER
- OW-# GROUNDWATER OBSERVATION WELL
- ⊕ EW-# GROUNDWATER EXTRACTION WELL
- ⊕ LPS-# LEACHATE PUMP STATION
- SIMW-# SURFACE IMPOUNDMENT MONITORING WELL
- DW-# DEEP WELL
- DIMW-# DIESEL IMPACTED MONITORING WELL
- SWP-# STORM WATER MONITORING POINT
- PIPING FOR AST SYSTEM

WDRs Order No. R5-2007-0180

ATTACHMENT E

MONITORING PARAMETERS & APPROVED USEPA ANALYTICAL METHODS

General

Ammonia as N
Bicarbonate
Chloride
Nitrate
Sulfates
Total Alkalinity
Total Kjeldahl Nitrogen
Total Dissolved Solids

Inorganics ¹	USEPA Method:
Cobalt	6020
Copper	6020
Iron	6010B
Manganese	6010B
Vanadium	6010B
Zinc	6010B
Nickel	6020
Potassium	6010B

1. Leachate, groundwater, and unsaturated zone samples shall be analyzed and reported as dissolved

Volatile Organic Compounds (VOCs)¹ (by USEPA Method 8260B):

Acetone
Acrylonitrile
Benzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)

ATTACHMENT E (CONTINUED)

1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- 1,4-Dichloro-2-butene
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1-Dichloroethylene (1,1-Dichloroethene; Vinylidene chloride)
cis-1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Ethylbenzene
2-Hexanone (Methyl butyl ketone)
Methyl bromide (Bromomethene)
Methyl chloride (Chloromethane)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl tert-butyl ether (MTBE)
4-Methyl-2-pentanone (Methyl isobutylketone)
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC-11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride
Xylenes

1. Report all peaks identified by the EPA test methods.

ATTACHMENT F

**CONSTITUENTS OF CONCERN &
APPROVED USEPA ANALYTICAL METHODS**

Inorganics ¹	USEPA Method:		
Aluminum	6010B	Silver	6020
Antimony	6020	Sodium	6010B
Barium	6010B	Tin	6010B
Beryllium	6010B	Vanadium	6010B
Cadmium	6020	Zinc	6010B
Calcium	6010B	Arsenic	6020
Chromium	6010	Lead	6020
Chromium VI ⁺	7196A	Mercury	7470A
Cobalt	6020	Nickel	6020
Copper	6020	Selenium	6020
Iron	6010B	Thallium	6020
Manganese	6010B	Cyanide, Total	9012A
Magnesium	6010B	Sulfide, Total	376.2
Potassium	6010B		

1. Leachate, groundwater, and unsaturated zone samples shall be analyzed and reported as dissolved, except as noted above.

Volatile Organics (USEPA Method 8260B):

Acetone	cis- 1,3-Dichloropropene
Acetonitrile (Methyl cyanide)	trans- 1,3-Dichloropropene
Acrolein	Ethylbenzene
Acrylonitrile	Hexachlorobutadiene
Allyl chloride (3-Chloropropene)	2-Hexanone (Methyl butyl ketone)
Benzene	Isobutyl alcohol
Bis(2-ethylhexyl) phthalate	Isodrin
Bromochloromethane (Chlorobromomethane)	Methacrylonitrile
Bromodichloromethane (Dibromochloromethane)	Methyl bromide (Bromomethane)
Bromoform (Tribromomethane)	Methyl chloride (Chloromethane)
Carbon disulfide	Methyl ethyl ketone (MEK; 2-Butanone)
Carbon tetrachloride	Methyl iodide (Iodomethane)
Chlorobenzene	Methyl methacrylate
Chloroethane (Ethyl chloride)	Methyl tert-butyl ether (MTBE)
Chloroform (Trichloromethane)	4-Methyl-2-pentanone (Methyl isobutyl ketone)
Chloroprene	Methylene bromide (Dibromomethane)
Dibromochloromethane (Chlorodibromomethane)	Methylene chloride (Dichloromethane)
1,2-Dibromo-3-chloropropane (DBCP)	Naphthalene
1,2-Dibromoethane (Ethylene dibromide; EDB)	Propionitrile (Ethyl cyanide)
o-Dichlorobenzene (1,2-Dichlorobenzene)	Styrene
m-Dichlorobenzene (1,3-Dichlorobenzene)	1,1,1,2-Tetrachloroethane

ATTACHMENT F (CONTINUED)

p-Dichlorobenzene (1,4-Dichlorobenzene)	1,1,2,2-Tetrachloroethane
trans- 1,4-Dichloro-2-butene	Tetrachloroethylene (Tetrachloroethene;
Dichlorodifluoromethane (CFC 12)	Perchloroethylene; PCE)
1,1-Dichloroethane (Ethylidene chloride)	Toluene
1,2-Dichloroethane (Ethylene dichloride)	1,2,4-Trichlorobenzene
1,1-Dichloroethylene (1,1-Dichloroethene;	1,1,1-Trichloroethane, Methylchloroform
Vinylidene chloride)	1,1,2-Trichloroethane
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)	Trichloroethylene (Trichloroethene; TCE)
trans- 1,2-Dichloroethylene (trans-	Trichlorofluoromethane (CFC- 11)
1,2-Dichloroethene)	1,2,3-Trichloropropane
1,2-Dichloropropane (Propylene dichloride)	Vinyl acetate
1,3-Dichloropropane (Trimethylene dichloride)	Vinyl chloride (Chloroethene)
2,2-Dichloropropane (Isopropylidene chloride)	Xylene (total)
1,1 -Dichloropropene	

Semivolatile Organics (USEPA Method 8270B - base, neutral, & acid extractables):

Acenaphthene	Endrin aldehyde
Acenaphthylene	Ethyl methacrylate
Acetophenone	Ethyl methanesulfonate
2-Acetylamino fluorene (2-AAF)	Famphur
Aldrin	Fluoranthene
4-Aminobiphenyl	Fluorene
Anthracene	Heptachlor
Benzo[a]anthracene (Benzanthracene)	Heptachlor epoxide
Benzo[b]fluoranthene	Hexachlorobenzene
Benzo[k]fluoranthene	Hexachlorobutadiene
Benzo[g,h,i]perylene	Hexachlorocyclopentadiene
Benzo[a]pyrene	Hexachloroethane
Benzyl alcohol	Hexachloropropene
alpha-BHC	Indeno(1,2,3-c,d)pyrene
beta-BHC	Isophorone
delta-BHC	Isosafrole
gamma-BHC (Lindane)	Kepone
Bis(2-chloroethoxy)methane	Methapyrilene
Bis(2-chloroethyl) ether (Dichloroethyl ether)	Methoxychlor
Bis(2-chloro-1-methylethyl) ether	3-Methylcholanthrene
(Bis(2-chloroisopropyl) ether; DCIP)	Methyl methanesulfonate
4-Bromophenyl phenyl ether	2-Methylnaphthalene
Butyl benzyl phthalate (Benzyl butyl phthalate)	Naphthalene
Chlordane	1,4-Naphthoquinone
p-Chloroaniline	1-Naphthylamine
Chlorobenzilate	2-Naphthylamine
p-Chloro-m-cresol (4-Chloro-3-methylphenol)	o-Nitroaniline (2-Nitroaniline)
2-Chloronaphthalene	m-Nitroaniline (3-Nitroaniline)
2-Chlorophenol	p-Nitroaniline (4-Nitroaniline)
4-Chlorophenyl phenyl ether	Nitrobenzene
	o-Nitrophenol (2-Nitrophenol)

ATTACHMENT F (CONTINUED)

Chrysene	p-Nitrophenol (4-Nitrophenol)
o-Cresol (2-methylphenol)	N-Nitrosodi-n-butylamine (Di-n-butylnitrosamine)
m-Cresol (3-methylphenol)	N-Nitrosodiethylamine (Diethylnitrosamine)
p-Cresol (4-methylphenol)	N-Nitrosodimethylamine (Dimethylnitrosamine)
4,4'-DDD	N-Nitrosodiphenylamine (Diphenylnitrosamine)
4,4'-DDE	N-Nitrosodipropylamine
4,4'-DDT	(N-Nitroso-N-dipropylamine;
Diallate	Di-n-propylnitrosamine)
Dibenz[a,h]anthracene	N-Nitrosomethylethylamine
Dibenzofuran	(Methylethylnitrosamine)
Di-n-butyl phthalate	N-Nitrosopiperidine
o-Dichlorobenzene (1,2-Dichlorobenzene)	N-Nitrosopyrrolidine
m-Dichlorobenzene (1,3-Dichlorobenzene)	5-Nitro-o-toluidine
p-Dichlorobenzene (1,4-Dichlorobenzene)	Pentachlorobenzene
3,3'-Dichlorobenzidine	Pentachloronitrobenzene (PCNB)
2,4-Dichlorophenol	Pentachlorophenol
2,6-Dichlorophenol	Phenacetin
Dieldrin	Phenanthrene
Diethyl phthalate	Phenol
p-(Dimethylamino)azobenzene	p-Phenylenediamine
7,12-Dimethylbenz[a]anthracene	Polychlorinated biphenyls (PCBs; Aroclors)
3,3'-Dimethylbenzidine	Pronamide
2,4-Dimehtylphenol (m-Xylenol)	Pyrene
Dimethyl phthalate	Safrole
m-Dinitrobenzene	1,2,4,5-Tetrachlorobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)	2,3,4,6-Tetrachlorophenol
2,4-Dinitrophenol	o-Toluidine
2,4-Dinitrotoluene	Toxaphene
2,6-Dinitrotoluene	1,2,4-Trichlorobenzene
Di-n-octyl phthalate	2,4,5-Trichlorophenol
Diphenylamine	2,4,6-Trichlorophenol
Endosulfan I	0,0,0-Triethyl phosphorothioate
Endosulfan II	sym-Trinitrobenzene
Endosulfan sulfate	
Endrin	

Organophosphorus Pesticides (USEPA Method 8141A):

- 0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)
- Dimethoate
- Disulfoton
- Methyl parathion (Parathion methyl)
- Parathion
- Phorate

ATTACHMENT F (CONTINUED)

Chlorinated Herbicides (USEPA Method 8151):

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)

Organochlorine Pesticides (USEPA Method 8081A)

Aldrin
BHCs
Chlordane
4,4'-DDD
4,4'-DDE
4,4'-DDT
Dieldrin
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
Lindane
Methoxychlor
Toxaphene

PCBs (USEPA Method 8082)

PCB-1016
PCB-1221
PCB-1232
PCB-1242
PCB-1248
PCB-1254
PCB-1260