California Regional Water Quality Control Board
Santa Ana Region

April 30, 2004

STAFF REPORT

ITEM: 9

SUBJECT: Waste Discharge Requirements for California Street Landfill, Redlands, Order No. R8-2004-0008

DISCUSSION:

The City of Redlands (hereinafter the Discharger) owns and operates the California Street Landfill (CSL) located at 2151 Nevada Street, Redlands, California. The CSL is an active Class III non-hazardous solid waste municipal landfill, which began accepting wastes generated within the City in 1963.

The Discharger is currently regulated under Waste Discharge Requirements (WDRs) Order No. 81-172 as amended by Order No. 98-99. The WDRs for the site are being updated to reflect the Discharger's request for expansion of the CSL beyond its current permitted footprint, and to implement those portions of the federal regulations (Subtitle D regulations) that are not addressed by, or are more restrictive than, the state's Title 27 regulations. The phased lateral and vertical expansion will increase the current 63-acre disposal area to approximately 115 acres, and will also result in an increase in the final elevation of the landfill from 1,238 to 1,255 feet above mean sea level (MSL). The proposed expansion of the landfill will add approximately 7 million tons of refuse capacity to the current 4.53 million-ton capacity, extending the life of the landfill from Year 2005 to Year 2031.

The Discharger has submitted an Environmental Impact Report (EIR) and a Joint Technical Document (JTD) for the proposed lateral and vertical expansion at the CSL. Regional Board staff has reviewed these documents and determined that there should be no adverse environmental impacts from the expansions, and that adequate protection to water quality will be provided if the project is carried out in a manner that implements all the mitigation measures provided for in the EIR, and the Discharger complies with the proposed order, Order No. R8-2004-0008.

The order requires that the Discharger install a liner and leachate collection and removal system in the expansion area; maintain and operate the existing landfill gas collection system and extend it into the expansion area; monitor groundwater on a quarterly basis; investigate and address any contamination determined to originate from the landfill; and maintain the drainage and erosion control system on all parts of the site.

This order contains waste discharge requirements that implement the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan). A revised Basin Plan was adopted by the Regional Board on March 11, 1994 and became effective on January 24, 1995. The Basin Plan specifies water quality objectives and beneficial uses for the groundwater and surface waters within the Region.

The requirements stipulated in this order implement the Basin Plan and are expected to be protective of water quality in the Region.

RECOMMENDATION:

Adopt Order No. R8-2004-0008, as presented.

Comments were solicited from the following agencies:

State Water Resources Control Board, Division of Clean Water Program – Joseph Mello
State Water Resources Control Board, Office of the Chief Counsel – Jorge Leon
California State Integrated Waste Management Board, Permitting – Sharon Anderson
California Department of Health Services, Sacramento – Bob Hultquist
San Bernardino County Department of Environmental Health Services, LEA – Jacquelyn Adams
City of Redlands Public Works Dept. – Gary Phelps/Gary Van Dorst
3D GeoServices – Mercedes Murillo
Vector Engineering, Inc – Scott Purdy

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SANTA ANA REGION

ORDER NO. R8-2004-0008

WASTE DISCHARGE REQUIREMENTS FOR CITY OF REDLANDS CALIFORNIA STREET LANDFILL CLASS III NON-HAZARDOUS SOLID WASTE DISPOSAL FACILITY SAN BERNARDINO COUNTY

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter Regional Board), finds that:

1. The City of Redlands (hereinafter the Discharger) owns and is responsible for the operation and maintenance of the California Street Landfill (CSL). The CSL is a Class III landfill that has accepted and currently accepts nonhazardous municipal solid waste (MSW) solely from areas within the City.

2. The discharge of waste to land is regulated by Title 27, California Code of Regulations (27 CCR). The terms used in this permit are defined in 27 CCR §20164.

3. The Regional Board adopted order No. 81-172 on September 11, 1981, for discharges of municipal solid wastes (MSW) to land at the CSL. Order No. 81-172 contains discharge requirements, provisions, and monitoring and reporting requirements in accordance with Title 23, Division 3, Chapter 15 of the California Code of Regulations (23 CCR), for landfill design, operations, and groundwater monitoring.

4. Order No. 81-172 was subsequently amended by Waste Discharge Requirements (WDR) Order Nos. 93-57 and 94-17, adopted on September 10, 1993 and March 11, 1994, respectively, to incorporate new federal regulations (Title 40, Code of Federal Regulations [40 CFR], Part 258, known as Subtitle D), and to prescribe uniform drainage and erosion control system requirements for MSW landfills in the Santa Ana Region.

5. On July 18, 1997, the State Water Resources Control Board (SWRCB) and the California Integrated Waste Management Board (CIWMB) enacted the Solid Waste Requirements, Subdivision 1 of new Division 2, Title 27, California Code of Regulations (27 CCR) to replace the non-hazardous waste portions of 23 CCR, Chapter 15.

6. On November 20, 1998, Order Nos. 93-57 and 94-17 were rescinded and replaced by WDR Order No. 98-99. Order No. 98-99 contains additional discharge, monitoring, and reporting requirements that require the Discharger to maintain the CSL in accordance with 27 CCR and with State Water Resource Control Board (SWRCB) Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste.*

7. Landfilling operations at CSL began in 1963. Approximately 63 acres of the original 115-acre site were originally surveyed and permitted for landfilling; the proposed lateral expansion of approximately 52 acres will complete the final landfill footprint. The CSL is located in the NW portion and in the northern half of the NE portion of Section 17, T1S, R3W, SBB&M and is shown on Attachment A, which is hereby made a part of this order. The physical address for the landfill is 2151 Nevada Street, Redlands, California, 92373.

8. The CSL is located in the northeastern portion of the San Bernardino Valley, along a portion of the southern bank of the Santa Ana River channel. Elevations across the site range from 1,150 feet above mean sea level (MSL) to 1,200 feet above MSL (west to east). Natural slopes in the area are nearly flat.

9. The CSL is located within the eastern portion of the Transverse Ranges Physiographic Province. This area of San Bernardino County is underlain primarily by the structurally down-dropped San Bernardino Valley block. This block is located between the northwesterly trending San Andreas and San Jacinto faults, located to the north and south of the site, respectively. The CSL is located in the central portion of the block. Subsidence of this block promoted the accumulation of over 1,000 feet of alluvial sediments in the central San Bernardino Valley. Coalescing alluvial fans emanating from the surrounding mountains and hills formed the alluvial plain which now forms the valley floor. The maximum thickness of alluvium in the area is estimated to be greater than 1,200 feet approximately 1 mile northwest of the landfill. The maximum thickness of alluvium at the landfill is greater than 700 feet.

10. The site is located in an arid to semi-arid environment. The average annual precipitation in the area is 16.4 inches. The estimated precipitation for a 24-hour, 100-year storm event is 5 inches as determined from 1982 National Weather Service (NOAA) data. The mean annual pan evaporation rate for the general area is estimated at 76 inches based on the 1979 California Department of Water Resources data for the City of San Bernardino. These weather data represent the data for the worst-case scenario.

11. The CSL is located along a portion of the southern bank of the Santa Ana River channel, within the Upper Santa Ana River Hydrologic Area, in the Mill Creek Hydrologic Subarea of the Santa Ana River Watershed (Santa Ana Hydrologic Basin). No natural lakes or other bodies of standing water, ephemeral seeps, or springs occur at the site. Depth to groundwater ranges from approximately 135 to 160 feet beneath the site. Groundwater generally flows from east to west across the site, at an average hydraulic gradient of 0.10 foot per foot.

12. Only municipal wastes generated within the City are accepted at CSL. Wastes accepted at CSL include about 50 percent residential wastes, 50 percent commercial and industrial waste, and special waste such as dried sewage sludge from the adjacent City's wastewater treatment plant.

13. The CSL currently operates under Order No. 81-172 as amended by Order No. 98-99. The site capacity under the currently permitted final design of the CSL is estimated to be 4.53 million cubic yards (MCY). If the current design capacity of the CSL is not expanded, landfilling operations will end in 2005. The Discharger proposes to increase the site's final design capacity to 11.4 MCY through various phases of lateral expansion. The proposed expansion of the landfill, which adds approximately 7 million tons of refuse capacity to the current 4.53 million-ton capacity, will extend the life of the landfill by, at least, an additional twenty-six years (from 2005 to 2031).

14. The WDRs for the site are being updated to reflect the Discharger's request for expansion of the CSL beyond its current permitted footprint of approximately 63 acres to 115 acres, and to implement those portions of the federal regulations that are not addressed by, or are more restrictive than, 27 CCR. This order updates and replaces WDR Order No. 81-172, and those portions of WDR Order No. 98-99 that apply to the CSL.

15. This order contains discharge requirements, provisions, and monitoring and reporting requirements in accordance with SWRCB Resolution No. 93-62 (which incorporates federal Subtitle D regulations) and 27 CCR for landfill design, operations, and water quality monitoring.

16. A revised Water Quality Control Plan (Basin Plan) became effective on January 24, 1995. The Basin Plan contains beneficial uses and water quality objectives for waters in the Santa Ana Region.

17. Surface drainage from the landfill property is to the Santa Ana River, Reach 5, the beneficial uses of which include:

    a. Municipal and domestic supply (applies to upstream of Orange Avenue in Redlands),
    b. Agricultural supply,
    c. Groundwater recharge,
    d. Water contact recreation (access prohibited in some portions by San Bernardino County Flood Control),
    e. Non-contact water recreation,
    f. Warm freshwater habitat,
    g. Wildlife habitat, and
    h. Rare, threatened, or endangered species habitat.

18. Groundwater from the alluvial deposits beneath the landfill property flows into the Bunker Hill II Groundwater Subbasin, the beneficial uses of which include:

    a. Municipal and domestic supply,
    b. Agricultural supply,
    c. Industrial service supply, and
    d. Industrial process supply.

19. Storm water discharges from CSL are regulated under the State Water Resources Control Board (SWRCB) Water Quality Order No. 97-03-DWQ, NPDES General Permit No. CAS000001, for discharges of storm water associated with industrial activities.

20. The environmental control systems consist of a landfill gas collection and removal system, a landfill gas condensate collection and removal system, a landfill gas monitoring system, an unsaturated (vadose) zone monitoring system, and a groundwater monitoring system.

21. The existing landfill gas (LFG) collection and extraction system consists of a series of horizontal collectors and vertical wells located in each operating or completed phase. LFG condensate is currently collected and conveyed through a series of horizontal collectors and sumps to the 1-megawatt co-generation facility located at the adjacent wastewater treatment plant owned by the Discharger. A series of LFG monitoring probes are located around the perimeter of the existing landfill footprint and along the southern boundary of the property. Additional gas extraction wells and perimeter gas monitoring probes will be installed as the site expands.

22. Water quality at the site is currently monitored under a Detection Monitoring Program (DMP) in accordance with the parameters and schedules set forth in Monitoring and Reporting Program (M&RP) No. 98-99-04. Water quality monitoring, sampling, and analyses are conducted and reported on a quarterly basis. The water quality monitoring program for CSL currently includes groundwater and unsaturated (vadose) zone monitoring.

23. The CSL has had infrequent, irregular low-level releases of volatile organic compounds (VOCs) in the past, but each release was successfully and immediately mitigated by conducting repairs, maintenance, and improvements to the landfill cover and/or the gas collection system. From the nature of the waste stream (see Finding 12, above) accepted at the CSL, it is likely that any future landfill-related releases to the environment will continue to be the result of migration of leachate and landfill gas, the by-products of waste decomposition, through the unsaturated zone.

24. Low levels of VOCs such as trichloroethylene (TCE), tetrachloroethylene (PCE), and dichloroethylene (DCE) were consistently detected in the groundwater from December 1998 to October 1999. Perchlorate has been consistently detected at background and compliance groundwater monitoring points at the site since September 1999. Perchlorate and VOC groundwater contamination plumes that are attributed to sources other than the CSL have degraded groundwater quality beneath, and adjacent to the landfill for sometime. These plumes, collectively known as the Crafton-Redlands Plume, were first documented in 1998 from earlier detections as the leading edges of contamination passed adjacent to and underneath the landfill.

    In September 1999 and January 2001, the Discharger submitted demonstration reports, reinforcing earlier evidence that sources in addition to the landfill might have contributed to VOCs detected in groundwater monitoring points at the site. In January 2002, the Discharger submitted additional water quality data to further demonstrate non-detections of VOCs for a period of eight quarters. On February 20, 2002, Board staff accepted the Discharger's demonstration reports, and concluded that detections of perchlorate, PCE,

TCE, and DCE in the groundwater at the site are caused by offsite sources, and returned the site to DMP.

25. Recent groundwater monitoring data from four newly installed wells (B-11 through B-14[1]) for the expansion area indicates that groundwater, both upgradient and downgradient of the expansion area, is impacted by perchlorate, PCE, TCE, and dibromochloropropane (DBCP). DBCP is a currently banned nematocide formerly used as a soil fumigant. The potential sources of DBCP in the groundwater could be attributed to any historical use of DBCP in citrus groves located east and south of the landfill. On March 8, 2004, the Discharger submitted a report, as required under Contingency Response D.6.a.ii of Order No. 98-99, which successfully demonstrated that DBCP originated from sources other than the landfill, and reaffirmed that PCE, TCE, and DCE continued to originate from offsite sources.

26. The existing landfill footprint consists of the inactive East Side Landfill and the active West Side Landfill. These existing units are shown on Attachment B, which is hereby made a part of this order. These waste management units (WMUs) are unlined because they were constructed prior to the adoption of Chapter 15 regulations. The cells were constructed on the existing grade, or a slightly excavated grade at the time of construction. The underlying material has a permeability of greater than 1×10^{-6} cm/s.

27. Provision C.2 of Order No. 98-99, 27 CCR §20330, SWRCB Resolution No. 93-62, and 40 CFR §258, stipulate that, as of October 9, 1993, a prescriptive composite liner[2] design (prescriptive standard design or PSD) must be included in all new waste containment systems at MSW landfills. This design must include, at a minimum, an upper synthetic flexible membrane[3] liner (FML) that is at least 60-mils[4] thick (if high density polyethylene is used), and a lower component of soil that is at least two feet thick and with a hydraulic conductivity of no more than 1×10^{-7} centimeters per second (cm/s). However, Regional Board Order No. 98-99, SWRCB Resolution No. 93-62, and 27 CCR §20080 allow for engineered alternatives to the prescriptive liner requirements, provided the performance criteria contained in 40 CFR §258.40(a)(1) and (c), Part III.A.1.b of SWRCB Resolution No. 93-62, and 27 CCR §20080(b), are satisfied.

28. The Discharger submitted an application on January 27, 2003, to expand the permitted footprint of the CSL. The application, which was submitted in the form of a Joint Technical Document (JTD), was considered complete by Regional Board staff on July 1, 2003. The phased lateral and vertical expansion will increase the current 63-acre disposal area to approximately 115 acres, and result in an increase in the final elevation of the landfill from 1,238 to 1,255 feet above MSL. The 52-acre landfill expansion area is shown on Attachment B.

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[1] These well locations are shown on Attachment B, which is hereby made a part of this order.
[2] A liner is a containment system, usually constructed of low permeability materials such as clay or plastic, which is placed at the bottom of a landfill, between the refuse and the natural subgrade. The purpose of the liner is to prevent, as much as is possible, the infiltration of contaminated water from the landfill into groundwater, and is a requirement of current, applicable regulations (40 CFR, 27 CCR, and the CWA).
[3] A membrane or geomembrane is a thin, impermeable material used as a liquid or vapor barrier.
[4] A "mil" is a unit of length equal to 1/1000 inch (0.0254 millimeters), used in measuring the diameter of wire, fabrics, or geosynthetics. "Geosynthetic" is a general term for all synthetic materials, such as geotextiles, geocomposites, geogrids, geonets, and geomembranes, used in geotechnical engineering applications.

29. A Final Environmental Impact Report (EIR) for the expansion was prepared in accordance with §15167 of the California Environmental Quality Act (CEQA) Guidelines. The Redlands City Council certified the EIR for expansion of the CSL on October 1, 2002. A Notice of Determination was filed with the Clerk of the County of San Bernardino on October 10, 2002 and the State Clearinghouse on October 16, 2002.

30. Regional Board staff has reviewed and commented on the EIR. If the project is carried out in a manner that implements all the mitigation measures provided for in the EIR, and the Discharger complies with this order, adequate protection to water quality will be provided, and there should be no adverse environmental impacts from the expansion.

31. California Water Code (CWC) §13263(a) requires that waste discharge requirements implement relevant water quality control plans. The requirements contained herein are intended to assure compliance with the Basin Plan, including water quality objectives and beneficial uses. The Discharger is proposing to implement a waste containment system that is performance-based, and considered equal to or more stringent than that required by SWRCB Resolution No. 93-62 and 27 CCR to protect water quality.

32. As part of the permit application for the expansion of the CSL, the Discharger has requested the use of an engineered alternative design (EAD) for the drainage layer component of the liner system in place of the prescriptive standard design (PSD) set forth in SWRCB Resolution No. 93-62 and 27 CCR for all new cells in the expansion area.

33. An engineered alternative design to the leachate drainage gravel layer is proposed because it will save installation time and will cost less while providing superior leachate drainage, and thus, better protection against water quality impairment than that offered by the drainage gravels.

34. The profiles of the PSD and the proposed EAD for both the sideslope and bottom liner systems are described below, from the top down, and are illustrated on Attachment C, which is hereby made a part of this order:

PSD	EAD
Refuse	Refuse
24-inch protective soil cover	24-inch protective soil cover
Geotextile filter fabric	Geocomposite drainage layer (8-oz/yd^2 non-woven geotextile bounded to geonet)
12-inch $1x10^{-2}$ cm/s drainage gravel layer	
Geotextile cushion fabric	
Minimum 60-mil high density polyethylene (HDPE) liner	Minimum 60-mil high density polyethylene (HDPE) liner
24-inch $1x10^{-7}$ cm/s low permeability layer	24-inch 1x10-7 cm/s low permeability layer
Prepared subgrade	Prepared subgrade

The sideslope liner system will be installed on 3:1 slopes in the Phase 1 expansion area. Stability analyses of the CSL expansion area have been performed to ensure that the liner systems and the leachate collection system will perform adequately during the operating life of the CSL and after closure. The global slope stability analysis indicated that the critical failure will occur through the refuse and along the liner surface, using a static and pseudo-static (earthquake) factor of safety (FS) of 1.5 and 1.0, respectively. A displacement (deformation) analysis was performed for the global stability failure surface with a pseudo-static FS of 1.0. The displacement analysis indicated that horizontal deformation along the geomembrane bottom liner, between the geonet and the 60-mil HDPE geomembrane, might be about 6 inches.

35. Title 27 CCR §20240(c) stipulates that there shall be a five-foot separation zone between MSW and the highest anticipated elevation of underlying groundwater. The highest groundwater elevation observed at the CSL since groundwater monitoring was implemented at the site is about 80 feet below the bottom of refuse. There are no portions of the CSL expansion area where natural groundwater seeps have been observed at the ground surface.

36. Regional Board staff has reviewed the JTD, which includes the performance equivalency demonstration report; slope stability analyses; the construction quality assurance/ construction quality control (CQA/ CQC) plan; post-closure maintenance plan (PCMP); financial assurance plan; and the design, operation, and drainage control plans for the expansion area. Regional Board staff has commented on the JTD and received responses from the Discharger during the JTD review period. On July 1, 2003, Regional Board staff issued an approval letter for the CSL JTD.

37. The capability of the liner system to afford water quality protection depends largely on good quality control during manufacturing of the materials to be used during construction, and diligent CQA/ CQC during the installation of these materials.

38. The Discharger is proposing to implement a rigorous CQA/ CQC program for all phases of project construction. The goal of the CQA/ CQC program is to ensure that only materials and installation procedures that meet the construction specifications are utilized for the liner system construction.

39. In March of 2004, the Discharger completed the former closure of the East Side Landfill, and will submit a final closure report for approval of the Executive Officer of the Regional Board. The West Side Landfill will reach its full capacity by December, 2005; the Discharger plans to close this portion of the landfill in accordance with 27 CCCR §21090(b)(1)(D).

40. The proposed post-closure land use is non-irrigated open-space graded to blend in with the natural surroundings and landscaping with low-maintenance ground cover and native plants and shrubs.

41. The Discharger has indicated in the CSL Post-closure Maintenance Plan (PCMP) that the deed to the landfill property, or some other instrument that is normally examined during title search, will be modified to include, in perpetuity, a notation advising any potential purchaser of the property that:

    a. The parcel has been used as a MSW landfill,
    b. The land use options for the parcel are restricted in accordance with the post-closure land uses set forth in the PCMP in the JTD, and
    c. In the event that the Discharger defaults in carrying out either the PCMP or any corrective action needed to address a release, then the responsibility for carrying out such work falls to the property owner, if other than the Discharger.

42. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe revised WDRs for the CSL.

43. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that the Discharger, in order to meet the applicable provisions contained in the California Water Code (CWC), Title 27 (27 CCR), SWRCB Resolution No. 93-62, and Subtitle D of the Federal Code of Regulations (40 CFR §258), shall comply with the following:

A. DISCHARGE SPECIFICATIONS

1. **Groundwater -** The existing units (East Side and West Side Landfills) at the California Street Landfill (CSL) are currently monitored under a Detection Monitoring Program (DMP). For all existing and new cells, including any cells constructed in the 52-acre expansion area, the discharge shall neither cause nor contribute to the contamination or pollution of ground water via the release of waste constituents in either the liquid or gaseous phase.

2. **Surface Water**

   The discharge shall neither cause nor contribute to any surface water contamination, pollution, or nuisance, including, but not limited to:

   a. Floating, suspended, or deposited macroscopic particulate matter or foam;
   b. Increases in bottom deposits or aquatic growth;
   c. An adverse change in temperature, turbidity, or apparent color change beyond natural background levels and occurrences;
   d. The creation or contribution of visible, floating, suspended, or deposited oil or other products of petroleum origin; and
   e. The introduction or increase in concentration of toxic or other pollutants/ contaminants resulting in unreasonable impairment of beneficial uses of the waters of the State.

3. **Unsaturated (Vadose) Zone** - The existing units at the CSL are currently monitored under a DMP. For all existing and new cells, including any cells constructed in the 52-acre expansion area, the discharge shall not cause any increase in the concentration of waste constituents in soil-pore gas, soil-pore liquid, soil, or other geologic materials outside of the CSL if such waste constituents could migrate to the waters of the State and cause a condition of contamination, pollution, or nuisance.
4. **Constituents of Concern** - The existing units at the CSL are in a DMP. For all existing and new cells, including any cells constructed in the 52-acre expansion area, the discharge shall not cause the concentration of any constituent of concern (COC) or monitoring parameter to exceed its respective background value in any monitored medium at any monitoring point pursuant to the attached Monitoring and Reporting Program (M&RP) No. R8-2004-0008.
5. The discharge of wastes shall not cause the release of pollutants or waste constituents in a manner that could cause a condition of contamination, pollution, or nuisance to occur, as indicated by the most appropriate statistical or non-statistical data analytical method and retest method listed in the attached M&RP No. R8-2004-0008.
6. There shall be no discharge of wastes that contain any substances in concentrations toxic to human, animal, or plant life, such that these wastes could commingle with waters of the State.
7. The treatment or disposal of wastes shall not cause a nuisance or pollution, as defined in the California Water Code (CWC), §13050.

B. DISCHARGE PROHIBITIONS

1. **Liquid Usage**
   a. The discharge of liquids, including groundwater, leachate or landfill gas condensate, or their use for dust control or irrigation, at a municipal solid waste (MSW) landfill is prohibited, unless the following conditions are met:
      i. The liquids are being returned to or used at the landfill that produced it; and
      ii. The portion of the landfill to which these liquids are discharged is equipped with a containment system meeting the requirements of Section B of this order; or
      iii. The liquids generated from the site are disposed of in accordance with a disposal plan approved by the Executive Officer of the Regional Board.

   b. This section shall not apply to groundwater, leachate, and landfill gas condensate generated from an MSW landfill that is treated in accordance with an approved plan prior to being used for dust control or irrigation over the lined portions of the site.

2. **Containment Systems Installed Beyond the Existing Footprint** – The discharges of MSW to any area of the CSL beyond the existing footprint of the site is prohibited unless approved by the Regional Board, and such discharge is to an area equipped with a containment system that is constructed in accordance with the standard of the industry, and that meets the additional requirements for both liners and leachate collection systems in accordance with an approved JTD or JTD addendum, and any additional requirements of 27 CCR §20080, §20330, and §20340, and State Board Resolution No. 93-62.

3. The discharge of hazardous or designated wastes at the site is prohibited

C. PROVISIONS

1. The Discharger shall comply with all discharge specifications, discharge prohibitions, provisions, and monitoring and reporting requirements of this order immediately upon its adoption.

2. The Discharger shall implement the attached M&RP No. R8-2004-0008 in order to detect, at the earliest opportunity, any unauthorized discharge of waste constituents from the Unit, or any impairment of beneficial uses caused by or associated with discharges of waste to the Unit.

3. All wastes shall be maintained on property owned or controlled by the Discharger.

4. The operation of the CSL shall not cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Clean Water Act (CWA), including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements, pursuant to CWA § 402.

5. During the months when precipitation can be expected, disposal activities shall be confined to the smallest area possible based on anticipated quantity of wastes that will be received and on operational procedures.

6. The Discharger the months when precipitation can be expected, disposal activities shall be confined to the smallest area possible based on anticipated quantity of wastes that will be received and on operational procedures.

7. The Discharger shall remove and properly dispose of any wastes that are placed at the site in violation of these requirements.

8. All sewage treatment plant grit and screening residues disposed of at the site must be segregated from public access and shall meet the following criteria:

   a. A moisture content of less than 50 percent;

   b. Disinfection in accordance with a method approved by the local Department of Environmental Health and the Regional Board; and

   c. An analysis for heavy metals.

9. All water treatment sewage sludge disposed of at the site must be segregated from public access and shall meet the following criteria:

    a. The sludge does not contain any wastes at hazardous levels;

    b. The sludge contains at least 20 percent solids (by weight) if primary sludge, or at least 15 percent solids if secondary sludge, mixtures of primary and secondary sludges; and

    c. A minimum solids to liquid ratio of 5:1 by weight shall be maintained to ensure that the codisposal will not exceed the initial moisture holding capacity of the nonhazardous solid waste, or a solids to liquid ratio as determined by the Executive Officer of the Regional Board based on site specific conditions.

10. The Discharger shall establish and maintain permanent monuments in California coordinates (or equivalent) to define the boundary of the footprint of the landfill. The benchmarks shall be certified by a licensed surveyor or a professional civil engineer authorized to practice in California.

11. Prior to the initiation of waste discharge in the proposed expansion area, the Discharger shall install an approved groundwater monitoring network.

12. The water used during landfill operations shall be limited to the minimum amount reasonably necessary for dust control purposes, fire suppression, and minor maintenance.

13. Except for the active face, at all times, all portions of the landfill shall have an approved intermediate or final cover.

14. At the end of each operating day, as defined in the CSL's Solid Waste Facility Permit (SWPF), or if landfilling operations cease for more than a 12-hour period, daily cover or an approved alternative daily cover (ADC) must be placed over the active face in a quantity and to a depth sufficient to prevent any waste from daylighting, or as directed by Regional Board staff.

15. The Discharger may file a written request, including appropriate supporting documents, with the Executive Officer of the Regional Board at any time, proposing modifications to M&RP No. R8-2004-0008. The Discharger shall implement any changes in the revised M&RP approved by the Regional Board's Executive Officer upon receipt of a signed copy of the revised M&RP.

16. **Alternative Liner Design**

    a. The Discharger has demonstrated that the engineered alternative design (EAD) for the drainage layer component of the 52-acre expansion area liner system satisfies the criteria for an engineered alternative to the prescriptive standard design (PSD) [as provided by 27 CCR, §20080 (b) and Part III.A.1.b. of SWRCB Resolution No. 93-62]. If the EAD fails to perform as expected, the Regional Board reserves the right to require additional protective measures at the landfill.

b. For any proposed EAD liner not approved by the Executive Officer of the Regional Board, the Discharger shall submit a Joint Technical Document (JTD) Addendum, demonstrating that the proposed EAD(s) satisfies the criteria for an engineered alternative to the PSD, as provided by 27 CCR §20080 (b). The Discharger shall submit a JTD Addendum for a proposed EAD at least 180 days prior to the estimated start date of the liner construction project.

17. **Subsequent Phase Expansion** – The Discharger intends to construct the liner system in phases. For each sequential phase of the 52-acre expansion, the following shall apply:

    a. An approved construction quality assurance/ quality control (CQA/ CQC) program shall be implemented during each phase of liner system construction. Preliminary construction documents and CQA plan, prepared in accordance with 27 CCR §20323, shall be submitted to the Executive Officer for review and approval 120 days prior to the anticipated start date of the liner construction project.

    b. The Discharger and its contractors shall submit progress reports on a daily basis to the Regional Board during each phase of liner system construction so that compliance with Item (a), above, can be determined.

    c. Within 90 days of completion of the liner system construction, the Discharger shall submit a final (as-built) report including drawings, maps, and CQA/ CQC certification.

18. **Water Quality Protection Standard** - Unless the Discharger proposes, and the Regional Board approves, an alternative water standard that meets the requirements of both 27 CCR §20390 and §20425, and 40 CFR § 258.50 et seq., the Discharger shall monitor compliance with this order using the water quality protection standard established by M&RP No. R8-2004-0008.

19. Should the initial statistical or non-statistical comparison of the data under 27 CCR §20415 for any Constituents of Concern (COC) or Monitoring Parameters (MP) indicate that a release is tentatively identified, the Discharger shall provide immediate verbal notification to their designated Regional Board staff contact. The Discharger shall also provide written notification by certified mail within seven days of such determination [27 CCR, §20420(j)(1)], and shall carry out two discrete retests within 30 days of the discovery of a tentative release in accordance with 27 CCR, §20415(e)(8)(E). The Discharger shall only analyze the retest samples for the constituents detected in the tentative release. The Discharger shall inform the Regional Board of the outcome of the retests as soon as the results are available, following up with written results submitted by certified mail within seven days of completing the retest. In addition, the Discharger shall include a compliance summary of the tentative release and the verification procedures in the quarterly report, prepared in accordance with Reporting C.1 of M&RP No. R8-2004-0008, for that monitoring period.

20. In the event that the CSL has a confirmed release, the Discharger shall comply with the following requirements, in order to bring the site into compliance with 27 CCR §20425 and 40 CFR §258.55):

a. 27 CCR 20420(k)(1) - Upon detection of a measurable significant release based upon monitoring parameter analysis performed in accordance with paragraphs A.5 and A.6 of M&RP No. R8-2004-0008, the Discharger shall collect a single sample from each monitoring point and analyze the samples for Constituents of Concern (COC). The Appendix II constituents are listed in Attachment D, Table 2 of M&RP No. R8-2004-0008. If detection of a new Appendix II constituent is verified, it must be noted in the operating record within 14 days of receipt of the verification, and added to the monitoring parameter list.

b. 27 CCR 20420(k)(5) - Within 90 days of determining "measurably significant" evidence of a release from the CSL, the Discharger shall file a JTD Addendum with the Regional Board to establish an evaluation monitoring program (EMP) (27 CCR §20425) and a federal Assessment Monitoring Program (AMP) (40 CFR §258.55).

c. 27 CCR 20420(k)(6) - Within 180 days of confirming a release, the Discharger shall submit a preliminary Engineering Feasibility Study (EFS) for a corrective action program necessary to meet the requirements of 27 CCR 20430.

d. The water quality monitoring at the CSL shall be conducted in accordance with 27 CCR §20425, EMP, and 40 CFR §258.55, AMP. The Discharger shall begin an Assessment of Corrective Measures (ACM) and Selection of Remedy (SOR) under 40 CFR §258.55, §258.56, and §258.57, respectively, <u>to the extent that these federal requirements are not addressed by the EMP.</u>

e. The Discharger shall continue to conduct annual Appendix II leachate analysis (for lined cells only) for all Appendix II constituents not yet detected in leachate, and to perform verification resampling within six (6) months of the preliminary identification of any new constituents. Any newly detected and verified constituents shall be added to the landfill's COC list and its monitoring parameter list for at least two years.

f. Install assessment wells as needed for the AMP and EMP;

g. Notify off-site affected parties within 30 days after discovery or confirmation of off-site migration of pollutants.

21. In the event that the CSL has a measurably significant release, the ACM must address the following issues:

a. The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual pollution;

b. The time required to begin and complete the remedy;

c. The costs of implementing the selected remedy;

d. State or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy.

22. In the event that the CSL has a measurably significant release, the SOR must address the following:
    a. The selected remedy must meet the following goals and standards:
        i. Protection of human health and the environment;
        ii. Attainment of the ground water protection standard [of 40 CFR §258.57(h or i)];
        iii. Control of the source(s) of releases so as to reduce or eliminate further releases of Appendix II constituents;
        iv. Compliance with standards for management of wastes as specified in 40 CFR §258.58(d).
    b. In selecting a remedy, the Discharger must consider the evaluation factors contained in 40 CFR §258.57(c); and
    c. The Discharger must propose a schedule, effective upon approval by the Executive Officer of the Regional Board, for initiating and completing the remedial activities as set forth in 40 CFR §258.57(d)(1-8).
    d. In the event that the release extends beyond the facility boundary, the Discharger must provide the Executive Officer of the Regional Board with a list of all persons who own or reside upon land that overlies the release, per 40 CFR §258.55(g)(1)(ii and iii), so that the Regional Board can invite these affected individuals to the Board Meeting at which the proposed corrective measures are chosen.
23. This Order supersedes and replaces WDR Order No. 81-172, as amended by Order No. 98-99, which is hereby rescinded. This order also replaces all portions of WDR Order No. 98-99 that are specific to the CSL; therefore, Order No. 98-99 is no longer applicable to the CSL.

D. DRAINAGE AND EROSION CONTROL

1. Waste management units shall be designed, constructed, and maintained to prevent, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, and washout which could occur as a result of precipitation from a 100-year, 24-hour frequency storm. This shall be accomplished by, at a minimum, the following:
    a. Top deck surfaces shall be constructed to achieve a minimum of one percent (1%) slope, including structures that direct water to down-drains;
    b. Downdrains and other necessary drainage structures must be constructed for all side slopes as necessary; and
    c. All components of the facility drainage system must be designed and constructed to withstand site-specific maximum intensity precipitation (peak flow[5]) from a 100-year, 24-hour storm.

[5] Peak flow is the maximum expected flow of run-on and runoff resulting from precipitation both on and off site for a given recurrence interval.

2. Leachate and landfill gas condensate containment system structures shall be protected and maintained continuously to ensure their effectiveness and to prevent commingling of leachate and gas condensate with surface run-on and runoff.

3. The Discharger shall design, construct, and maintain:

   a. A run-on drainage control system to prevent flow from off-site sources onto the disposal areas of the landfill (active or inactive portions), and to collect and divert both the calculated volume of precipitation and the peak flow from off-site sources that result from a 100-year, 24-hour storm;

   b. A runoff drainage control system to minimize sheet flow from the disposal areas, and to collect and divert both the calculated volume of precipitation and the peak flow from on-site surface runoff that results from a 100-year, 24-hour storm; and

   c. Drainage control structures to divert natural seepage from native ground and to prevent such seepage from entering the waste management units.

4. All drainage structures shall be protected and maintained continuously to ensure their effectiveness.

5. Annually, **by October 1**, all drainage control system construction and maintenance activities shall be completed. By December 31 of each year, the Discharger shall submit a drainage control system maintenance report to the Executive Officer of the Regional Board. The drainage control system maintenance report shall include, but not be limited to, the following information:

   a. For the previous 12 months, a summary of the adequacy and effectiveness of the drainage control system to collect and divert the calculated volume of precipitation and peak flows resulting from a 100-year, 24-hour storm;

   b. A tabular summary of both new and existing drainage control structures, including the types and completion dates of maintenance activities performed for each of these structures; and

   c. An 11"x17" or larger site map indicating the locations of the elements listed in Item b., above, and the flow direction of all site drainage.

6. At least 30 days prior to the construction of any new elements of the drainage control system, the Discharger shall submit a workplan outlining all design parameters and calculations, construction details, and a construction quality assurance plan for approval by the Executive Officer of the Regional Board.

7. The Discharger shall submit as-built drawings within 4 weeks of completing construction of any new elements of the drainage control system at the site.

8. All design plans, construction plans, and operation and maintenance plans shall be prepared by, or prepared under the direct supervision of, a registered civil engineer or a certified engineering geologist.

9. Periodic inspection of the waste management units, the drainage control system, and all containment structures shall be performed to assess the conditions of these facilities and to initiate corrective actions necessary to maintain compliance with Provisions E.1 through E.5 of this order.

10. The facility shall be surveyed once a year either by aerial surveillance or by a licensed surveyor to assure compliance with the one percent slope requirements. By December 31 of each year, a map compiled from the survey data shall be submitted to the Regional Board, showing landfill elevations, the flow direction of all site drainage, the drainage control system, and containment structures.

11. The Discharger shall maintain a copy of this order at the site so as to be available at all times to site operating personnel.

12. The Discharger shall permit the Regional Board:

    a. Entry upon premises where a discharge source is located;

    b. To copy any records required to be kept under terms and conditions of this order;

    c. To photograph or videotape any structures, facilities, activities, or other phenomena that could result in adverse impacts to water quality and that are pertinent to compliance of the landfill with its WDRs; and

    d. To sample any discharges.

E. REQUIRED REPORTS AND NOTICES

1. REPORTING PROVISIONS

a. All applications, reports, or information submitted to the Regional Board shall be signed and certified in accordance with 27 CCR §21710(d).

b. The Discharger shall furnish, within a reasonable time, any information the Regional Board may request to determine whether cause exists for modifying, reissuing, or terminating this order. The Discharger shall also furnish to the Regional Board, upon request, copies of records that this order requires the discharger to maintain.

2. The Discharger shall file a JTD Amendment with the Regional Board at least 120 days before making any material change or proposed change in the character, location, volume, treatment, or disposal methods of any discharge of waste.

3. Prior to discharging any waste in the proposed expansion area, the Discharger shall file with the Regional Board an operations plan for approval by the Executive Officer, which shall be updated whenever substantial changes in operations are made. A report documenting conformance with the operations plans shall be submitted annually. The operations plan shall include the information required by 27 CCR §21760(b).

4. The operations plan shall also include the following:

    a. A map showing the boundaries of the disposal site and waste disposal areas;

    b. A description of the waste materials anticipated to be received;

    c. A general description of disposal site operations;

d. Measures proposed for control of drainage, leachate, and landfill gases;
e. A description of the ground water monitoring program for the new cell and
f. Anticipated land use after termination of disposal operations.

5. **CLOSURE AND POST-CLOSURE PLANS**:

   In accordance with 27 CCR §21780 (c)(3), final closure and postclosure maintenance plans (PCMPs) for solid waste landfills shall be submitted two years prior to the anticipated date of closure. Within five years of the anticipated date of closure, the operator may submit the final closure and PCMPs in lieu of submitting new or updated preliminary closure and PCMPs.

6. **FINANCIAL ASSURANCE PLANS**

   The Discharger shall obtain and maintain assurances of financial responsibility for:

   a. Closure activities pursuant to 27 CCR § 22207;
   b. Post-closure maintenance activities pursuant to 27 CCR §22212; and
   c. Corrective action activities pursuant to 27 CCR §22222.

7. **REGIONAL BOARD NOTIFICATION** – The Discharger shall give advance notice to the Regional Board of any planned changes in the permitted facility or site activities that may result in noncompliance with these WDRs.

8. In the event of any change in control or ownership of land or waste discharge facilities currently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this order by letter. A copy of this letter shall be signed by the new owner accepting responsibility for complying with this order, and shall be forwarded to the Executive Officer of the Regional Board.

9. The Discharger shall notify the Regional Board in writing of any proposed change in ownership or responsibility for construction, operation, closure or post-closure maintenance of the landfill. This notification shall be given prior to the effective date of the change and shall include a statement by the new discharger that construction, operation, closure, and post-closure maintenance will be in compliance with any existing WDRs and any revisions thereof.

10. The Discharger shall notify the Executive Officer of the Regional Board by telephone (909-782-4130) within 24 hours of any failure of facilities necessary to maintain compliance with the requirements in this order. Within five days, the notification shall be submitted in writing to the Executive Officer.

11. The Discharger shall notify the Regional Board immediately of any slope failure occurring in a waste management unit. Any failure that threatens the integrity of containment features or the landfill shall be promptly corrected after approval of a remediation workplan and schedule by the Executive Officer of the Regional Board.

F. PERMIT REVISION

1. If more stringent applicable water quality standards are promulgated or approved pursuant to section 303 of the federal CWA, 40 CFR, SWRCB Resolution No. 93-62, or 27 CCR, or amendments thereto, the Regional Board will revise and modify this order in accordance with such standards.

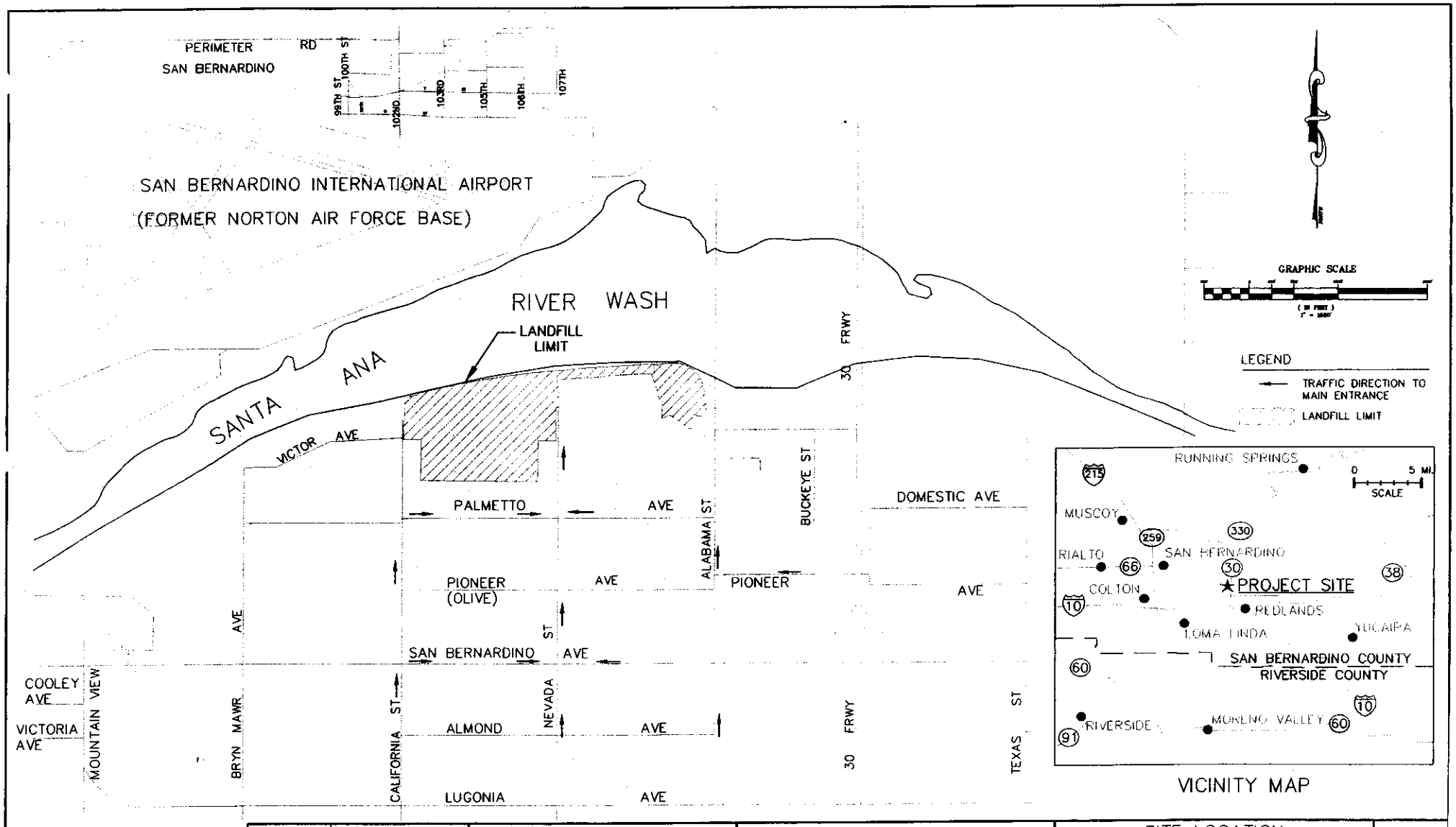
2. This order may be revised to address any changes in state or federal plans, policies, or regulations that would affect the water quality standards for the discharges.

3. Any noncompliance with this order constitutes a violation of the CWC and 27 CCR, and is grounds for enforcement action.

4. This order may be revised or terminated for cause. The filing of a request by a discharger for revision or termination of this order, or a notification of anticipated noncompliance, does not stay any condition of this order.

I, Gerard J. Thibeault, 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, Santa Ana Region, on April 30, 2004.

_____
Gerard J. Thibeault
Executive Officer



Job No.	981020.12
Date:	05/15/03
Approval By:	TVR
Drawn By:	JMA/JVR
Scale:	1" : 1500'

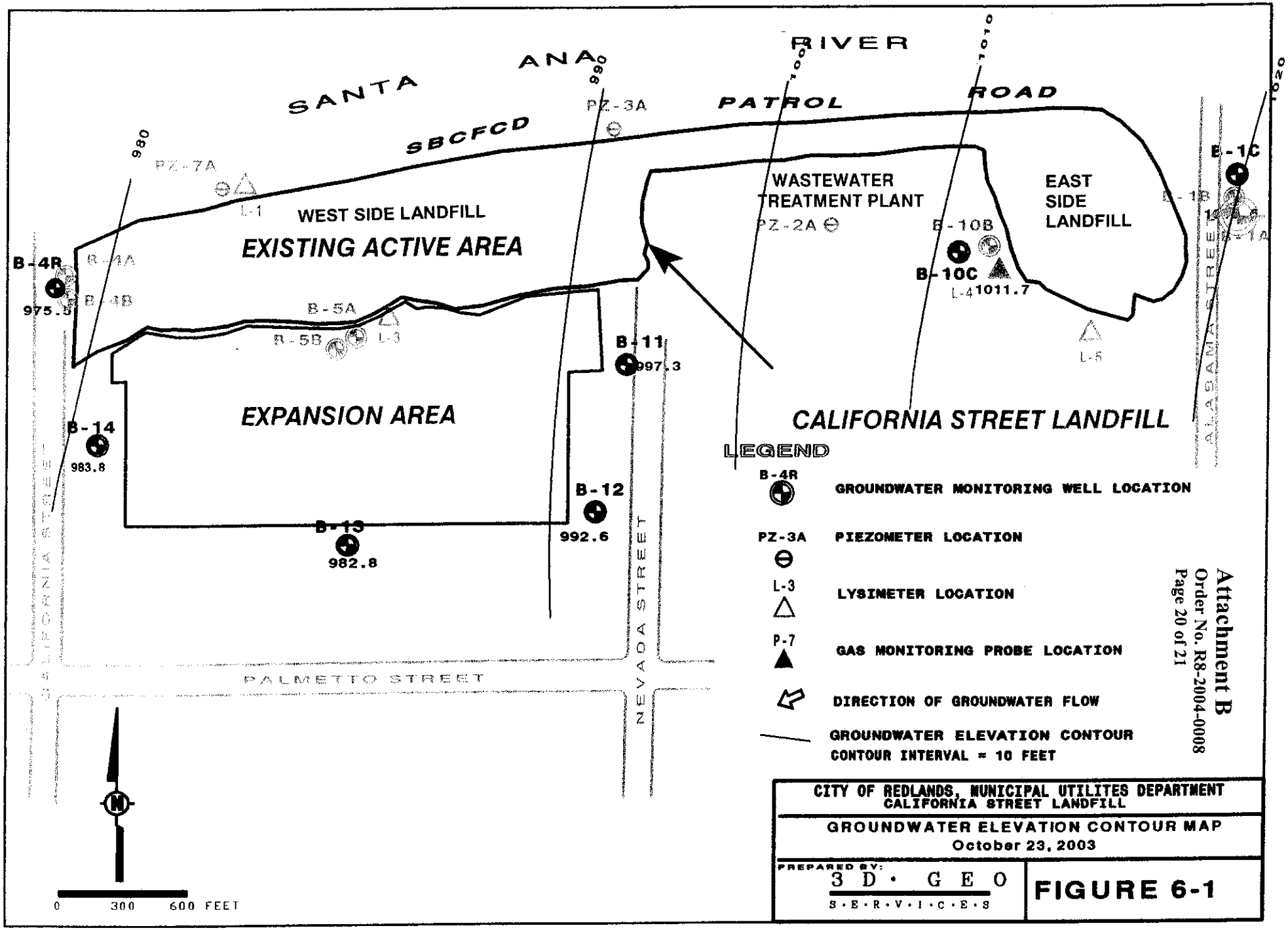
CITY OF REDLANDS
MUNICIPAL UTILITIES DEPARTMENT

VECTOR ENGINEERING, INC.
Grass Valley, CA • Houston, TX • Chile • Argentina • Peru • Philippines

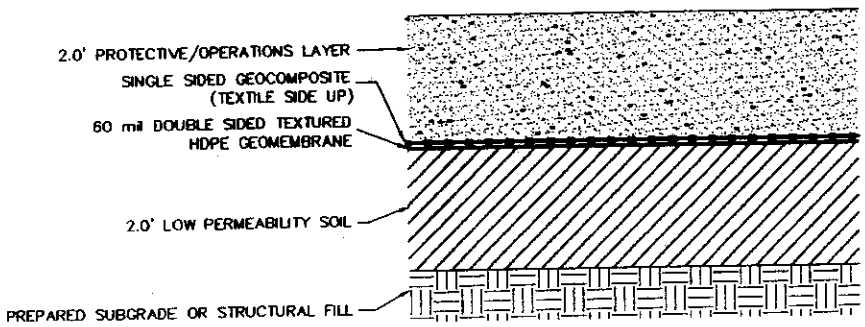
SITE LOCATION
CALIFORNIA STREET LANDFILL

FIGURE
1—1

Attachment A
Order No. R8-2004-0008
Page 19 of 21



Attachment B
Order No. R8-2004-0008
Page 20 of 21



TYPICAL LINER SYSTEM

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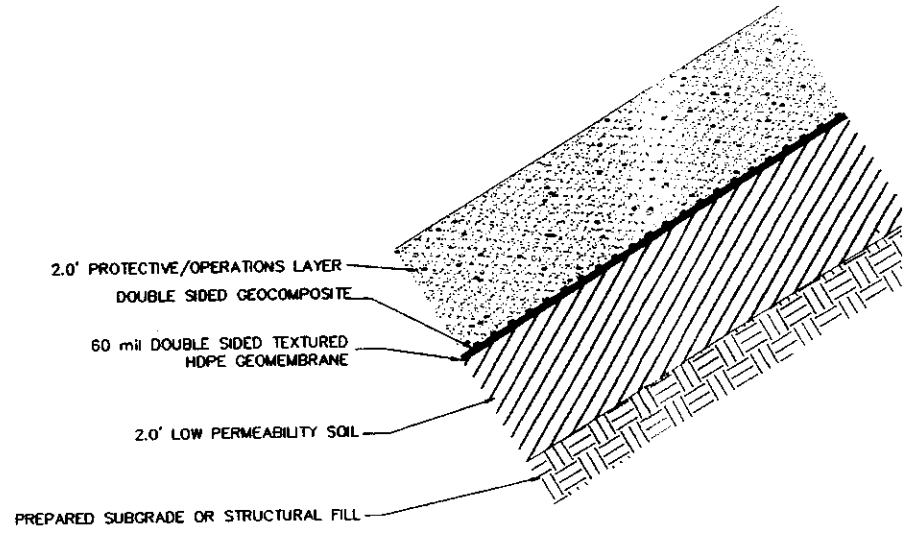

TYPICAL SIDE SLOPE LINER SYSTEM

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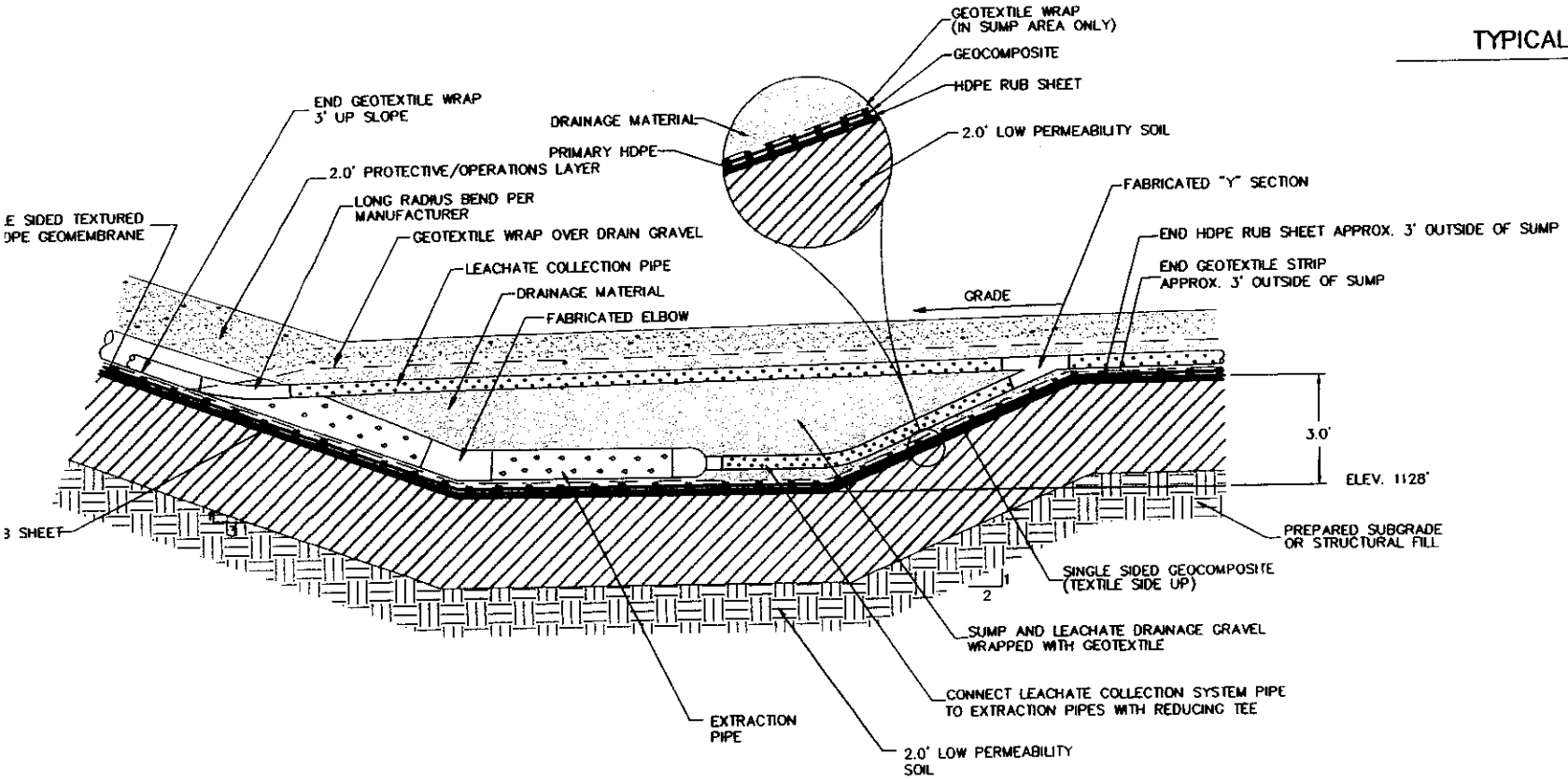

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SANTA ANA REGION

ORDER NO. R8-2004-0008

MONITORING AND REPORTING PROGRAM (M&RP) NO. R8-2004-0008
FOR

THE CITY OF REDLANDS

CALIFORNIA STREET LANDFILL
CLASS III SOLID WASTE DISPOSAL SITE
SAN BERNARDINO COUNTY

A. GENERAL

1. Groundwater beneath the California Street Landfill (CSL) exceeds the Ground Water Protection Standard (water standard) of Title 27, California Code of Regulations (27 CCR) § 20390, §20395, and §20400, or Title 40, Federal Code of Regulations (40 CFR) §§258.50 et seq., for tetrachloroethylene (PCE), trichloroethylene (TCE), dichloroethylene (DCE), dibromochloropropane (DBCP), and perchlorate. All of these exceedences have been attributed to sources other than the CSL. The City of Redlands (hereinafter "the Discharger") shall perform monitoring activities to track constituents already detected in groundwater and to detect any constituents of concern at the CSL attributable to landfill activities. The Discharger shall implement appropriate data analysis methods in accordance with 27 CCR §20415(e)(6 through 10) for groundwater data collected.

2. The concentration limit for any given Monitoring Parameter (MP)[1] or Constituent of Concern (COC)[2] in a given monitored medium (e.g., the uppermost aquifer) at a municipal solid waste (MSW) landfill shall be established in accordance with paragraphs A.4.a and A.4.e of this Monitoring and Reporting Program (M&RP). These concentration limits shall be used as the basis of comparison with data from the monitoring points in that monitored medium.

3. Compliance and background monitoring points for the existing permitted and new expansion areas of the CSL shall be established and monitored in accordance with 27 CCR §20405 (Detection Monitoring Program) and 40 CFR §258.54 (Detection Monitoring Program), in accordance with the monitoring parameters (see Attachment D, Table 1, MPs for groundwater, surface water, soil pore liquids, landfill gas, etc.), monitoring and reporting schedules (see Attachment D, Table 5), and analytical methods (see Attachment D, Table 6) outlined in this M&RP:

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[1] See Attachment D, Table 1 and paragraph A.6, below, of this M&RP for a list of monitoring parameters and data analysis.
[2] See Attachment D, Table 1 and paragraph A.7, below, of this M&RP for COC lists.

a. **Monitoring Parameters (MP)** – The Discharger shall analyze all groundwater monitoring points in accordance with the monitoring frequency and for the MP listed in Attachment D, Table 1 of this M&RP. The MP list shall be updated whenever a constituent, not already on the MP list, is detected and verified in a retest during the five-yearly Constituent of Concern (COC) scan (see paragraph 3.b, below).

b. **Five-Yearly COC Scan** — Every five years, subsequent to 2004, the Discharger shall analyze all ground water monitoring points for the detectable presence (including trace determinations) of all COCs in COC-List 1 and COC-List 2 (see Attachment D, Table 1). This constitutes the means by which the Discharger will meet or exceed the requirements of 40 CFR §258.54.

   i. A minimum of one sample from each groundwater monitoring well must be collected and analyzed during each COC scanning event. If a COC is detected that is not yet on the monitoring parameter list, the Discharger shall, within 30 days, take a single resample from the indicating well(s) and reanalyze it only for the indicated constituent(s).

   ii. Any COC detected in samples collected from a groundwater monitoring well, and verified by a retest, automatically becomes part of the MP list for the facility. The Discharger shall notify Regional Board staff (see paragraph C.7 of this M&RP) of any such change immediately, via phone or e-mail, shall note it in the operating record within 14 days of the verification, and shall note prominently the constituent(s) added to the MP list in the next scheduled monitoring report.

4. STATISTICAL DATA ANALYSIS METHODOLOGY

a. Intra-well comparison methods shall be used for all compliance wells for all constituents that are detectable at concentrations above their respective Method Detection Limit[3] (MDL) in 10% or more of the background data to date. Therefore, the concentration limit for such a constituent, at any given compliance well, shall be the background value as indicated by all validated data from that compliance well in the period including the years 1996 and through 2004. Every two years, at the beginning of the second (spring) quarter monitoring period (April 1), newer data shall be added to the background data set for each compliance well after being validated by a method approved by the Executive Officer of the Regional Board. At any time, the background data set shall consist of, at a minimum, the last five (5) years of monitoring data, except for newly detected monitoring parameters for which there is less than 5 years of data available.

b. If a control chart approach is used to evaluate water quality monitoring data, the Discharger shall performance the analysis in accordance with 27 CCR §20415(e)(9)(C).

c. In the event that an approved data analysis method provides a preliminary indication that a given monitoring parameter has a measurably significant increase at a given well, the Discharger shall conduct a verification procedure (two discrete retests) in accordance with 27 CCR §20415(e)(8)(E).

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[3] The method detection limit, or MDL, is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in 40 CFR §136, Appendix B.

d. The verification procedure shall be performed only for the constituent(s) or parameter(s) that has shown "measurably significant" (see 27 CCR §20164 for definition) evidence of a release, and shall be performed only for those monitoring points at which a release is indicated.

e. For any monitoring parameter that is detectable at concentrations above its respective MDL in 10% or less of the background data to date, the constituent's concentration limit shall be its MDL. A measurable exceedance of this concentration limit shall be determined by application of the non-statistical analysis method described in paragraph A.5 of this M&RP.

f. Water Quality Monitoring Approach — Except for COC scans, discussed under paragraph A.3.b of this M&RP, the monitoring approach used for each MP at each compliance well (well/MP pair) shall be controlled by whether that MP has exhibited a measurably significant increase at that well. Therefore, the Discharger shall monitor each well/MP pair in one of two modes, as follows:

   i. **Detection Mode** — For a MP that has not shown a measurably significant increase at that compliance well, the purpose of monitoring, for that well/MP pair, is to watch for the MP's arrival at that well at a concentration strong enough to trigger a measurably significant release using an appropriate statistical or nonstatistical data analysis method. Once an MP shows a measurably significant increase at a well, future monitoring of that well/MP pair is done in "tracking mode"; or

   ii. **Tracking Mode** — For a MP that has produced a measurably significant increase at that well, the purpose of the monitoring, for that well/MP pair, is to verify the suitability and effectiveness of the existing or proposed corrective action measures by tracking changes in the MP's concentration at that location via a concentration-versus-time plot.

g. **Detection Mode Data Analyses** — The following applies to all detection mode data analyses (i.e., this paragraph does not apply to the COC scans under paragraphs A.3.b or B.1.b.v.):

   i. **Monitoring Parameters Readily Detectable in Background** — At any given monitoring point, the Discharger shall apply an appropriate statistical analysis for each detection mode monitoring parameter that exceeds its-respective MDL <u>in at least 10%</u> of the applicable background data set. The Discharger is currently using the inter-well, Parametric and non-Parametric ANOVA methods for statistical data analysis. In accordance with 27 CCR §20415(e)(7)(B)(2), the Discharger shall not change the data analysis method unless as directed or approved by the Executive Officer of the Regional Board.

   ii. **Monitoring Parameters Not Readily Detectable in Background** — For any monitoring point at which one or more monitoring parameters, in detection mode, exceed their respective MDL in <u>less than 10%</u> of the applicable background data set, the Discharger shall analyze the data for these monitoring parameters via the California Non-Statistical Data Analysis Method (CNSDAM) test described in paragraph A.5 of this M&RP.

5. **CALIFORNIA NON-STATISTICAL DATA ANALYSIS METHOD (CNSDAM)**

   a. **Non-Statistical Method For Seldom-Detected Monitoring Parameters in Detection Mode -** For any given compliance (downgradient) well, regardless of the monitoring program in effect (DMP, EMP, AMP, or CAP), the Discharger shall use this data analysis method, jointly, for all constituents on the "scope list" of paragraph A.5.a.i of this M&RP (or, for each retest sample using the modified scope list of paragraph A.5.b.ii).

      i. **Scope List** — Create a current "scope list" showing each detection mode monitoring parameter, at that well, that exceeds its MDL in <u>less than 10%</u> of its background data (see paragraph A.4.f.i of this M&RP).

      ii. **Two Triggers** — From the scope list made under paragraph A.5.a.i, above, for an initial test (or, for a retest using the modified scope list under A.5.b.ii, below), identify each monitoring parameter in the <u>current</u> sample from that compliance well that exceeds its respective MDL or Practical Quantitation Level (PQL)[4]. The Discharger shall conclude that these identified monitoring parameters provide a tentative indication (or, for a retest, provide a measurably significant indication), of a change in the nature or extent of the release at that well, if ***either:***

         (a) Two or more of the monitoring parameters exceed their respective MDL, *or*
         (b) At least one monitoring parameter equals or exceeds its PQL.

   b. Discrete Retest [27 CCR §20415(e)(8)(E)]:

      i. In the event that the Discharger concludes (pursuant to paragraph A.5.a.ii, above) that there is a tentative indication of a release, then the Discharger shall immediately notify Regional Board staff by phone or e-mail and, within 30 days of such indication, shall collect two new (retest) samples from the indicating compliance well.

      ii. The Discharger shall analyze the retest samples only for those constituents indicated in the original test, under paragraph A.5.a.ii, above, and these indicated constituents shall comprise the "modified scope list." As soon as the retest data are available, the Discharger shall apply the same test (under paragraph A.5.a.ii, above, but using this modified scope list) to separately analyze each of the two suites of retest data at that compliance well.

      iii. If either (or both) of the retest samples trips either (or both) of the triggers under paragraph A.5.a.ii, then the Discharger shall conclude that there is a change in the nature or extent of the known release for the constituent(s) at that well, as indicated in the validating retest sample(s). Furthermore, thereafter, the Discharger shall monitor the indicated constituent(s) in tracking mode (see paragraph A.4.f.ii of this M&RP) at that well, shall remove the constituent(s) from the scope list created (under paragraph A.5.a.i of this M&RP) for that well, and shall highlight this conclusion and these changes in the next scheduled monitoring report.

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[4] The practical quantitation level, or PQL, is the lowest concentration of a substance that can be consistently determined within +/- 20% of the true concentration by 75% of the laboratories tested in a performance evaluation study. Alternatively, if performance data are not available, the PQL for carcinogens is the method detection limit (MDL) multiplied by 5, and for noncarcinogens is the MDL x 10. Estimated PQLs are listed in Appendix II to 40 CFR258.

6. MONITORING PARAMETERS

a. The Discharger shall analyze separate samples from each water-bearing medium (e.g., surface water, including seeps and springs, the uppermost aquifer beneath the site, perched zones, subdrains, or soil-pore liquid [from the vadose zone[5]], and from landfill gas [LFG]) for the approved monitoring parameters and frequencies listed in Attachment D, Table 1 of this M&RP. The monitoring parameters include metal surrogates and the VOCs listed in Appendix I pursuant to 40 CFR 258.54(a)(2). The monitoring parameters must be analyzed in accordance with the methods listed in Attachment D, Table 6 of this M&RP.

b. For any constituents that are detected at concentrations above their respective MDL in 10% or less of the background data to date, the constituent's concentration limit shall be its MDL at any given time. The Discharger shall analyze the data for these monitoring parameters using the CNSDAM described in paragraph A.5 of this M&RP.

c. For any constituents that are detected at concentrations above their respective MDL in more than 10% of the background data to date, the constituent's concentration limit shall be its background value at any given time. The Discharger shall analyze the data for these monitoring parameters using an appropriate statistical data analysis method as allowed in paragraph A.4 of this M&RP.

d. The Discharger shall test the analytical data from all monitored media, except leachate, LFG, and LFG condensate, using the **statistical methods** as allowed in paragraph A.4 of this M&RP and 27 CCR §20415(e)(8) for the following parameters:

   i. **General Chemistry** — Bicarbonate, Carbonate, Chemical Oxygen Demand (COD), Chloride, Nitrate (as Nitrogen), Sulfate, Total Dissolved Solids (TDS), pH, Hydroxide, Dissolved Carbon Dioxide, and Total Alkalinity;

   ii. **Leachate Indicator Metals** — Calcium, Iron, Magnesium, Manganese, Potassium, and Sodium;

   iii. **Detectable VOCs in Background** — Each VOC that exceeds its respective MDL in at least ten percent (10%) of the applicable background data set for a monitored water-bearing medium during a given reporting period;

   iv. **Other Monitoring Parameters** — Any monitored Appendix II constituent not covered under paragraphs A.6.d.iii, above, that exceeds its respective MDL in at least 10% of the applicable background data set for a monitored water-bearing medium during a given reporting period.

e. Monitoring parameters for the required monitoring program at the CSL shall be approved by the Executive Officer of the Regional Board. The Executive Officer may approve alternative monitoring parameters that meet the requirements of both 27 CCR §20380 et seq. and 40 CFR §258.54. The Executive Officer may also approve alternative statistical or non-statistical methods that meet the requirements of 27 CCR §20415(e) and 40 CFR §258.53.

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[5] The vadose zone, or zone of aeration, is a subsurface zone that is located directly above the water table and contains water at less than atmospheric pressure. The vadose zone includes water held by capillarity, and air or gases held generally under atmospheric pressure.

7. **CONSTITUENTS OF CONCERN (COC)**

   a. For unlined portions of the landfill, i.e. West and East Landfills, COC-List 1 shall consist of those constituents listed in Attachment D, Table 1 of this M&RP.

   b. For the lined portion of the landfill, the Discharger shall develop and maintain COC-List 2 (Attachment D, Table 7 of this M&RP) under 27 CCR §20395 as follows:

      i. **Initial COC-List 2** – The Discharger shall analyze the first annual leachate sample for all Appendix II constituents (see Attachment D, Table 4 for a list of Appendix II constituents). The initial COC-List 2 shall consist of those Appendix II constituents that are detected in the first annual leachate sample and confirmed in its leachate retest sample collected from the lined cell; and

      ii. **Building and augmenting COC-List 2** – The initial COC-List 2 shall be updated annually through annual leachate testing of any Appendix II constituents that are not already on the COC-List 2. The COC-List 2 shall be augmented by adding an Appendix II constituent not already on the COC-List 2 that was both:

         (a) Detected in the annual October sampling of the landfill's leachate (see paragraph B.1.b.v. of this M&RP); and

         (b) Also detected in the retest of a leachate sample collected the following April.

8. **ESTABLISHING BACKGROUND VALUES**

   a. **For Existing Monitoring Points** — Whenever a new COC is established, under paragraphs A.3.b.ii of this M&RP, the Discharger shall establish the prevailing concentration of that constituent by taking one sample at least quarterly for two years at each background and downgradient monitoring point. The Discharger shall use these data:

      i. To validate downgradient monitoring well data relative to upgradient well data via box-and-whiskers plots;

      ii. To show that it is reasonable to assume that each downgradient well's data do not reflect a release; and

      iii. Subsequent to such validation, to serve as the initial background data set for intra-well comparisons at that well.

   b. **For New Monitoring Points** — For any new upgradient or downgradient well installed <u>less than two years prior to or after</u> the effective date of this M&RP, the Discharger shall establish the prevailing concentration for each COC by taking at least one sample quarterly for two years. These data shall be used, as described in i) and ii) of paragraph A.8.a, above.

9. **UNSATURATED (VADOSE) ZONE MONITORING**

   The purpose of an unsaturated zone monitoring program is to provide the best assurance of the earliest possible detection of a release from the landfill. Soil pore liquids from the existing lysimeters, and landfill gas from the perimeter gas probe with the highest methane reading, shall be collected and analyzed for the monitoring parameters listed in Attachment D, Table 1 on a quarterly basis. Monitoring of LFG is considered necessary in order to provide a method for detecting LFG-transported constituents that may not be

detected in soil pore liquids and that could impact groundwater beneath the facility. After two years of LFG data have been collected and compared to the other water quality monitoring parameters at the site, the Discharger may request a decrease in the frequency of monitoring or in the number of perimeter probes monitored for water quality purposes if it can be shown that the quality and types of the data collected at the site will not be adversely impacted.

B. MONITORING PROGRAM

1. WATER QUALITY MONITORING:

a. Sample collection, storage, and analysis shall be performed according to the most recent version of Standard United States Environmental Protection Agency (USEPA) Methods (USEPA Publication "SW-846").

b. The Discharger shall comply with the requirements of 27 CCR §20415 for any water quality monitoring program developed to satisfy 27 CCR §20420, §20425, §20430, and the requirements of this order.

   i. The groundwater monitoring shall meet the requirements of 27 CCR §20415(b) and 40 CFR §258.51 (a, c, and d).

   ii. The surface water monitoring shall meet the requirements of 27 CCR §20415(c). In addition, whenever possible, volumetric flow rate shall be measured, or, at a minimum, visually estimated, for surface water and seeps or springs monitored at the site.

   iii. Unsaturated zone monitoring shall meet the requirements of 27 CCR §20415(d) and shall be conducted in accordance with paragraph A.9 of this M&RP.

   iv. All general monitoring requirements shall be in accordance with 27 CCR §20415(e).

   v. Pursuant to 40 CFR §258.55 (b), the October leachate sample(s)[6] shall be analyzed for all the constituents of Appendix II (to 40 CFR §258) that have not, to date, been detected in the landfill's leachate and shall be verified by resampling. If the October leachate testing identifies any new Appendix II constituents that have not been previously detected in the leachate, the Discharger shall obtain a single leachate retest sample the following April and analyze it for the new constituents. Any such new constituents verified in the April retest become part of the landfill's COC-List 2. For each newly detected COC, the Discharger shall establish an initial background data set in accordance with paragraph A.8 of this M&RP. A new COC detected and verified in the groundwater shall be added to the MP list in accordance with paragraph A.3.b.ii of this M&RP.

c. In the event that a release is identified at the CSL, the Discharger must implement both the state EMP and the federal AMP within 90 days of the confirmation of the release. The EMP must meet the requirements contained in 27 CCR §20425, and the federal AMP must meet any additional requirements contained in 40 CFR §258.55. Therefore, the Discharger shall:

   i. Within 30 days of the confirmation of the release, submit a proposal and compliance schedule for implementing an EMP and an AMP.

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[6] The October leachate sampling is only required for the lined portion of the landfill.

ii. Within 90 days of the confirmation of the release, submit a preliminary Engineering Feasibility Study (EFS) under 27 CCR §20425. The Discharger shall also begin an Assessment of Corrective Measures (ACM) and Selection of Remedy (SOR) under 40 CFR §§258.55, 258.56, and 258.57, respectively, to the extent that these federal requirements are not addressed by the EMP or the landfill's current monitoring program. The preliminary EFS shall include a substantiated list of proposed realistic dates for meeting all applicable milestones of the EMP/ AMP, ACM, and SOR.

iii. Within 180 days of the confirmation of the release, submit an EMP progress report, a final EFS, and a draft amended Joint Technical Document (JTD), meeting the requirements of 27 CCR §20425(c) and (d) and 40 CFR §258.56, §258.57, and §258.58, to establish a CAP.

d. Regardless of the monitoring program in effect (EMP/ AMP or CAP), the Discharger shall continue to monitor groundwater for all well/MP pairs in accordance with paragraph A.4.f of this M&RP.

2. **GENERAL SITE MONITORING**

a. All general site inspections shall be documented; all deficiencies identified during general site monitoring shall be transmitted to the Regional Board via facsimile (FAX), e-mail, or other approved method, within 48 hours of occurrence. This same documentation must also be submitted as part of the reports described in paragraph C.4.b. of this M&RP.

b. At a minimum, all systems, such as landfill gas condensate and leachate containment structures, subdrains, sumps, and lysimeters, shall be inspected and evaluated on a weekly basis for their effectiveness. All deficiencies identified, and the dates and types of corrective action taken, shall be recorded in a permanent log. All deficiencies shall be photographed (if possible) for the record. The volume of liquids collected in each containment structure shall be recorded weekly for active sites. Liquid samples, such as gas condensate and leachate, shall be collected in accordance with the appropriate monitoring frequency, and analyzed for constituents specified in Attachment D, Table 1 of this M&RP.

c. Monthly, the Discharger shall inspect all waste management units and shall evaluate their effectiveness to comply with Drainage and Erosion Control D.1 of Order No. R8-2004-0008. All areas of slope failure, differential settlement, fissuring, erosion, ponding, leachate staining, and seepage into or from the landfill shall be identified, field-marked, documented, and mitigated. In the event seepage is discovered, the location of each seep shall be mapped and a mitigation plan submitted for the approval of the Executive Officer of the Regional Board. All findings shall be photographed for the record.

d. At a minimum, all run-on and runoff drainage control structures shall be inspected and evaluated monthly for their effectiveness. During dry weather conditions, the effectiveness of the drainage control system shall be evaluated on the basis of its conformance to the as-built drawings, or revised drawings, for the system. All deficiencies shall be identified, recorded and mitigated. Any failure of the drainage and erosion control system at the site must be reported to the Executive Officer of the Regional Board within 24 hours of the occurrence of the event, and repairs implemented immediately.

e. Annually, **by October 15**, an aerial or ground survey of the landfill facility shall be performed in accordance with the schedule in Attachment D, Table 5 of this M&RP.

C. REPORTING

1. **Monitoring report contents** — All reports shall be submitted no later than one month following the end of their respective monitoring period. The reports shall be comprised of at least the following, in addition to the specific contents listed for each type of report:

   a. **Transmittal letter** — A letter summarizing the essential points in the report. This letter shall include a discussion of any violations or deficiencies found since the last such report was submitted, and shall describe corrective actions taken or planned;

   b. **Compliance evaluation summary** — For groundwater monitoring and COC reports, a compliance evaluation summary shall be included which references the sampling and quality assurance plans. The compliance evaluation summary shall include at least the following:

      i. **Flow rate/direction** — For each monitoring point addressed by the report, a tabular summary and graphical presentation of the measured groundwater elevation data for the previous 5 years, and a description and graphical presentation (e.g., arrow on a map) of the velocity and direction of groundwater flow under/around CSL, based upon water level elevations taken during the collection of the water quality samples;

      ii. **Well information** — For each monitoring well addressed by the report, a description of the method and time of water level measurement, and a description of the method of purging used to remove stagnant water in the well before sampling, pursuant to 27 CCR §20415(e)(12)(B);

      iii. **Sampling Information** — For each monitoring point addressed by the report, a description of the type of pump or other device used and its vertical placement for sampling, and a detailed description of the sampling procedures (number and description of the samples, field blanks, travel blanks, and duplicate samples taken, the type of containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking the samples, and any other observations); and

      iv. A discussion of any activities that deviated from the sampling and quality assurance plans.

   c. **Map** — A map (or copy of an aerial photograph) showing the locations of observation stations and monitoring points;

   d. **Laboratory data** — The laboratory results of all analyses shall be submitted in accordance with paragraph C.4.a of this M&RP, and shall indicate for each analyte that is detected at less than its respective PQL:

      i. The PQL or the estimated MDL;

      ii. An indication as to whether the constituent was detected or not; and

      iii. In the case of a trace detection, the estimated concentration, if possible.

e. **Statistical verification procedure and reporting** — Per 27 CCR §20415(e)(8)(E)(6), the Discharger shall notify the Executive Officer of the Regional Board by certified mail of the results of both the initial statistical test and the results of the verification procedure, as well as all concentration data collected for use in these tests within seven (7)days of the last laboratory analysis of the samples collected for the verification procedure;

f. **Landfill gas condensate and leachate containment systems, subdrain, and lysimeter monitoring** — A statement as to the condition and performance of these systems and monitoring points;

g. **Permanent and interim drainage and erosion control systems** — A statement as to the condition and performance of these systems;

h. **Waste type and placement** — The quantity and types of wastes discharged and a map indicating the locations in the landfill where waste has been placed since submittal of the last such report; and

i. If alternative daily cover (ADC) is used at the site that meets the requirements of 27 CCR §20705(e), and has been approved by Regional Board staff, the type, amount (including, if applicable, average thickness), method of placement, and any problems or deficiencies encountered must be noted in the report.

2. **October leachate sampling results** — The Discharger shall report to the Regional Board, no later than **January 31 of each year**, the analytical results of the leachate sample taken the previous October, including an identification of all detected Appendix II constituents that are not on the landfill's COC-List 2 (non-COCs).

3. **April retest results** — If the annual leachate sample taken in October identifies any non-COCs, the Discharger shall collect and analyze a retest sample the following April. The retest sample shall be analyzed only for the non-COCs detected in the October sample. During any year in which an April leachate retest is carried out, the Discharger shall submit a report to the Regional Board no later than August 1 of that year. This report must identify all constituents that were detected in both the previous calendar year's October sample and in the April retest sample, and must permanently add these constituents to the landfill's COC-List 2. The report shall also include an updated COC-List 2 that includes the Appendix II constituents that are newly detected in both the October and April leachate samples.

4. **Compliance monitoring reports**

a. The Discharger shall submit water quality monitoring and analytical data (pursuant to paragraphs B.1 of this M&RP) for the monitoring periods and reporting due dates specified in Attachment D, Table 5 of this M&RP. The Discharger may propose an alternate schedule, and the Executive Officer may approve the proposal, or may require the Discharger to comply with an alternate reporting frequency.

b. General site monitoring and analytical data (pursuant to paragraphs B.2.a, b, c, and d of this M&RP) shall be submitted for the monitoring periods and reporting due dates specified in Attachment D, Table 5 of this M&RP. When necessary, abbreviated reports shall also be submitted under the following conditions:

i. Within 48 hours of the occurrence or identification of any deficiencies or failures of on-site systems such as landfill gas condensate and leachate containment structures, groundwater extraction and treatment systems, subdrains, and lysimeters. A brief synopsis, including the identified deficiencies, pertinent photographs, and the date and type of corrective action that has, or will be, taken to correct these deficiencies, shall be forwarded to Regional Board staff.

ii. If any areas of slope failure, differential settlement, fissuring, erosion, ponding, leachate staining, and/ or seepage into or from the landfill are identified, a brief report with pertinent photographs and the date and type of corrective action that has, or will be, taken to correct these deficiencies, shall be submitted to Regional Board staff within 48 hours of the occurrence of the event.

iii. During the rainy season, the Discharger shall submit a brief "storm report" within 48 hours of a major storm event (defined as any storm that results in the site receiving more than 0.5 inches of precipitation within a 24-hour period). This report shall include pertinent photographs, the identification of any deficiencies, and the date and type of corrective action that has, or will be, taken to correct these deficiencies.

5. **Annual summary report** — The Discharger shall submit an annual report to the Regional Board covering the previous monitoring year (April 1 of the previous year through March 31 of the following year). The annual summary reports are due on **April 30** (see Attachment D, Table 5 of this M&RP). This report may be combined with the monitoring report period ending March 31, and shall meet the following requirements:

a. **Graphical Presentation** — All graphs shall include, at a minimum, the last five (5) years of available data for that monitoring point or constituent. Trend analyses shall include analysis of trends that have been identified over the last monitoring year, and analysis of any newly identified trends, significant changes in a known trend, or trend reversals identified in the historical data collected over the last 5 years for groundwater, surface water (including seeps and springs), and vadose zone monitoring points (subdrains, lysimeters, or LFG);

i. Graphing of the Analytical Data shall be in accordance with 27 CCR §20415(e)(14):

(a) All graphs shall be at a scale appropriate to show trends or variations in water quality;

(b) All graphs for a given constituent shall be plotted at the same scale to facilitate visual comparison of monitoring data;

(c) Each graph shall represent data from one compliance or background monitoring point and one COC or monitoring parameter.

ii. Graphing of analytical data shall also include pertinent constituent trend charts for groundwater, surface water, vadose zone monitoring points, or other mediums of interest that provide a comparison of both the background and compliance monitoring data, and an indication of the behavior of constituents in the various media at the site.

b. **Hydrographs** shall be provided for analysis and identification of any historical groundwater elevation fluctuations at the site. Background wells and compliance wells within the same aquifer shall be plotted on the same graph for comparison.

c. **Table and diskette(s)** — Data for all monitoring parameters detected at measurably significant concentrations (at or above the MDL) during the previous twelve months shall be presented in hard copy tabular form as well as on floppy disk, CD-ROM, or in a commonly available compressed format (e.g., WinZip or NORTON BACKUP) in accordance with 27 CCR §20420(h). The data shall be presented in MS-DOS/ASCII format, EXCEL, or other file format acceptable to the Executive Officer of the Regional Board. This data set shall also include the background data used as a reference in detecting the measurably significant increase.

d. **Compliance record discussion** — A comprehensive discussion of the compliance record, and of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the landfill's waste discharge requirements.

e. **Waste allocation map** — A map showing the area, if any, in which filling has been completed during the previous calendar year.

f. **Summary of changes** — A written summary of monitoring results and monitoring and control system(s), indicating any changes made or observed since the previous annual report.

g. **Leachate and gas control** — For units having leachate and gas monitoring/ control facilities, an evaluation of the effectiveness of the liquid waste containment units, pursuant to 27 CCR §20340 (b, c, & d). The evaluation shall also include a tabular summary of a list of deficiencies identified and the dates and types of corrective actions taken to achieve compliance with the requirements contained in this order.

6. **Annual drainage control and maintenance report** — By October 1 of each year, all drainage and erosion control system construction and maintenance activities shall be completed. In accordance with Drainage and Erosion Control D.5 of Order No. R8-2004-0008, annually, by **December 31**, a site drainage control and maintenance report containing the following information shall be submitted:

   a. For the previous 12 months, a summary of the adequacy and effectiveness of both permanent and interim drainage control systems to collect and divert the calculated volume of precipitation and peak flows resulting from a 100-year, 24-hour storm.

   b. A tabular summary of the new and existing drainage control structures, including the type of structure and its dimensions (especially for conveyance structures), and the completion dates of maintenance activities performed for each of the structures.

   c. An 11 x 17 inch or larger facility site map indicating the location of the elements listed in item b, above, of this M&RP, and the flow direction of site drainage.

7. **Five-Year COC Scan** — In conducting the five-yearly COC scan, under paragraph A.3.b of this M&RP:

   a. If a previously undetected COC is discovered and verified in any monitoring well, the Discharger shall inform Regional Board staff by telephone of the well and constituent involved, and shall take and analyze a retest sample from the indicating well within 30 days, analyzing only for the newly detected constituent.

   b. If the retest sample verifies the presence of the constituent, then, within 7 days:

      i. The Discharger shall communicate the verification to Regional Board staff by phone,

ii. The constituent shall be added to the monitoring parameter list for the site,

iii. The Discharger shall insert a dated copy of the revised monitoring parameter list in the Operating Record, and

iv. The Discharger shall report the new monitoring parameter prominently in the next monitoring report thereafter.

8. **Reporting Schedule** - The Discharger shall submit all reports and documents in accordance with the deadlines specified in Attachment D, Table 5 of this M&RP.

9. **Signature** - All reports shall be signed by a responsible officer or a duly authorized representative of the Discharger and shall be submitted under penalty of perjury.

I, Gerard J. Thibeault, 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, Santa Ana Region.

_____

Gerard J. Thibeault
Executive Officer

April 30, 2004

Attachment D - Table 1

Program	Monitoring Parameters	Monitoring Frequency
Detection monitoring	pH, total dissolved solids, chloride, sulfate, nitrate (as nitrogen), bicarbonate, carbonate, chemical oxygen demand (COD), hydroxide, dissolved carbon dioxide, total alkalinity, and 47 Appendix I VOCs[7]	Quarterly
COC-List 1 analysis[7]	Appendix I constituents[8] and General minerals[9]	Once every five years
COC-List 2 analysis[10]	[11]	Once every five years
Vadose zone monitoring	Methane (field), total gaseous non-methane organic (TGNMO), and the 17 core group VOCs per SCAQMD Rule 1150.1	Quarterly
Surface water monitoring[12]	pH, total dissolved solids, chloride, sulfate, nitrate (as nitrogen), bicarbonate, carbonate, chemical oxygen demand (COD), hydroxide, dissolved carbon dioxide, total alkalinity, and 47 Appendix I VOCs	Quarterly
Leachate monitoring	General minerals and Appendix II constituents[13]	Annually

[7] COC analysis for Monitoring Wells BC-1C, 10C, and 4R and any subsequent new/replacement wells installed for the existing units (East and West Side Landfills).
[8] See Table 3.
[9] See Table 2.
[10] COC analysis for Monitoring Wells B-11, 12, 13, and 14, and any subsequent new/replacement wells installed for the expansion area.
[11] See Table 7.
[12] Water samples, one upstream and one downstream of the landfill site, shall be collected from the Santa Ana River Channel whenever available and accessible.
[13] See Table 4.

Attachment D - Table 2

LIST OF GENERAL MINERALS

Parameter	USEPA Method	Parameter	USEPA Method
Total Hardness	130	Total Dissolved Solids	160.1
Bicarbonate (HCO_3)	310.1	Chemical Oxygen Demand	410.4
Carbonate ($CaCO_3$)	310.1	Phenols	420.1
Total Alkalinity	310.1	Total Organic Carbon	415
Total Cations	[14]	Total Organic Halogens	450.1
Total Anions	[14]	Calcium (Ca)	200.7/215
Hydroxide (OH)	[15]	Magnesium (Mg)	200.7/242.1
Chloride (Cl)	325	Manganese (Mn)	200.7/243.1
Fluoride (F)	340	Potassium (K)	200.7/258.1
Nitrate (NO_3) as Nitrogen	353.2	Sodium (Na)	200.7/273.1
Sulfate (SO_4)	375	Iron (Fe)	200.7/236.1
Phosphate (PO_4)	365.2	Zinc (Zn)	200.7/289.1
Total Phosphorus	365.1/365.2		
Boron (B)	212.3/200.7		
Specific Conductance (Electrical Conductivity - EC)	120.1		
pH	150.1		

[14] Total cations and anions are determined by the summation of all cations and anions, respectively, in the sample analyzed.

[15] The standard method, SM 2330B, in the "Standard Methods for the Examination of Water and Wastewater" for hydroxide ion analysis shall be used.

Attachment D - Table 3

LIST OF APPENDIX I CONSTITUENTS

Inorganic Constituents	**Organic Constituents – continued**
Antimony	p-Dichlorobenzene; 1,4-Dichlorobenzene
Arsenic	trans-1,4-Dichloro-2-butene
Barium	1,1-Dichloroenthane; Ethylidene chloride
Beryllium	1,2-Dichloroethane; Ethylene dichloride
Cadmium	1,1-Dichloroethylene; 1,1-Dichloroethane; Vinylidene chloride
Chromium	cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene
Cobalt	trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene
Copper	1,2-Dichloropropane; Propylene dichloride
Lead	cis-1,3-Dichloro propene
Nickel	trans-1,2-Dichloropropene
Selenium	Ethylbenzene
Silver	2-Hexanone; Methyl butyl ketone
Thallium	Methyl bromide; Bromomethane
Vanadium	Methyl chloride; Chloromethane
Zinc	Methylene bromide; Dibromomethane
	Methylene chloride; Dichloromethane
Organic Constituents	Methyl ethyl ketone; MEK; 2-Butanone
Acetone	Methyl iodide; Iodomethane
Acrylonitrile	4-Methyl-2-pentanone; Methyl isobutyl ketone
Benzene	Styrene
Bromochloromethane	1,1,1,2-Tetrachloroethane
Bromodichloromethane	1,1,2,2-Tetrachloroethane
Bromoform; Tribromomethane	Tetrachloroethylene; Tetrachloroethene; Perchloroethylene
Carbon disulfide	Toluene
Carbon tetrachloride	1,1,1-Trichloroethane; Methylchloroform
Chlorobenzene	1,1,2-Trichloroethane
Chloroethane; Ethyl chloride	Trichloroethylene; Trichloroethene
Chloroform; Trichloromethane	Trichlorofluoromethane; CFC-11
Dibromochloromethane; Chlorodibromomethane	1,2,3-Trichloropropane
1,2-Dibromo-3-chloropropane; DBCP	Vinyl acetate
1,2-Dibromoethane; Ethylene dibromide; EDB	Vinyl chloride
o-Dichlorobenzene; 1,2-Dichlorobenzene	Xylenes

Attachment D - Table 4

APPENDIX II CONSTITUENTS

Acenaphthene
Acenaphthylene
Acetone
Acetonitrile; Methyl cyanide
Acetophenone
2-Acetylaminofluorene; 2-AAF
Acrolein
Acrylonitrile
Aldrin
Allyl chloride
4-Aminobiphenyl
Anthracene
Antimony (total)
Arsenic (total)
Barium (total)
Benzene
Benzo[a]anthracene; Benzanthracene
Benzo[b] fluoranthene
Benzo[k] fluoranthene
Benzo[ghi] perylene
Benzo[al pyrene
Benzyl alcohol
Beryllium (total)
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC; Lindane
Bis(2-chloroethoxy) methane
Bis(2-chloroethyl) ether; Dichloroethyl ether
Bis(2-chloro-1-methylethyl) ether; 2,2-Dichlorodiisopropyl ether; DCIP
Bis(2-ethylhexyl) phthalate
Bromochloromethane; Chlorobromomethane
Bromodichloromethane; Dibromochloromethane
Bromoform; Tribromomethane
4-Bromophenyl phenyl ether
Butyl benzyl phthalate; Benzyl butyl phthalate
Cadmium (total)
Carbon disufide
Carbon tetrachloride
Chlordane
p-Chloroaniline
Chlorobenzene
Chlorobenzilate
p-Chloro-m-cresol; 4-Chloro-3-methylphenol
Chloroethane; Ethyl chloride
Chloroform; Trichloromethane
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chloroprene
Chromium (total)
Chrysene
Cobalt (total)
Copper (total)
m-Cresol; 3-methylphenol
o-Cresol; 2-methylphenol
p-Cresol; 4-methylphenol
Cyanide
2,4-D; 2,4-Dichlorophenoxyacetic acid
4,4-DDD
4.4-DDE
4,4-DDT
Diallate
Dibenz [a,h] anthracene
Dibenzofuran
Dibromochloromethane; Chlorodibromomethane
1,2-Dibromo-3-chloropropane; DBCP
1,2-Dibromoethane; Ethylene dibromide; EDB
Di-n-butyl phthalate
o-Dichlorobenzene; 1,2-Dichlorobenzene
m-Dichlorobenzene; 1,3-Dichlorobenzene
p-Dichlorobenzene; 1,4-Dichlorobenzene
3,3-Dichlorobenzidine
trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane; CFC 12
1,1-Dichloroethane; Ethyldidene 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
2,4-Dichlorophenol
2,6-Dichlorophenol
1,2-Dichloropropane; Propylene dichloride
1,3-Dichloropropane; Trimethylene dichloride
2,2-Dichloropropane; Isopropylidene chloride
1,1-Dichloropropene
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Dieldrin
Diethyl phthalate
0,0-Diethyl 0-2-pyrazinyl phosphorothioate; Thionazin
Dimethoate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3-Dimethylbenzidine
2,4-Dimethylphenol; m-Xylenol
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol
Di-n-octyl phthalate
Diphenylamine
Disulfoton
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethylbenzene
Ethyl methacrylate
Ethyl methanesulfonate

Table 4 (continued)

LIST OF APPENDIX II CONSTITUENTS

Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Hexachloropropene
2-Hexanone; Methyl butyl ketone
Indeno (1,2,3-cd) pyrene
Isobutyl alcohol
Isodrin
Isophorone
Isosafrole
Kepone
Lead (total)
Mercury (total)
Methacrylonitrile
Methapyrilene
Methoxychlor
Methyl bromide; Bromomethane
Methyl chloride; Chloromethane
3-Methylcholanthrene
Methyl ethyl ketone; MEK; 2-Butanone
Methyl iodide; Iodomethane
Methyl methacrylate
Methyl methanesulfonate
2-Methylnaphthalene
Methyl parathion; Parathion methyl
4-Methyl-2-pentanone; Methyl isobutyl ketone
Methylene bromide; Dibromomethane
Methylene chloride; Dichloromethane
Naphthalene
1,4-Naphthoquinone
1-Napthylamine
2-Napthylamine
Nickel (total)
o-Nitroaniline; 2-Nitroaniline
m-Nitroaniline; 3-Nitroaniline
p-Nitroaniline; 4-Nitroaniline
Nitrobenzene
o-Nitrophenol; 2-Nitrophenol
p-Nitrophenol; 4-Nitrophenol
N-Nitrosodi-n-butylamine
N-Nitrosodiethylamine
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine
N-Nitrosomethylethylamine
N-Nitrosopiperidine
N-Nitrosopyrrolidine
5-Nitro-o-toluidine
Parathion
Pentachlorobenzene
Pentachloronitrobenzene
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Phorate
Polychlorinated biphenyls; PCBS; Aroclors
Pronamide
Propionitrile; Ethyl cyanide
Pyrene
Safrole
Selenium (total)
Silver (total)
Silvex; 2,4,5-TP
Styrene
Sulfide
2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid
1,2,4,5-Tetrachlorobenzene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene; Tetrachloroethene; Perchloroethylene
2,3,4,6-Tetrachlorophenol
Thallium (total)
Tin (total)
Toluene
o-Toluidine
Toxaphene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane; Methylchloroform
1,1,2-Trichloroethane
Trichloroethylene; Trichloroethene
Trichlorofluoromethane; CFC-11
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
1,2,3-Trichloropropane
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene
Vanadium (total)
Vinyl acetate
Vinyl chloride; Chloroethene
Xylenes (total)
Zinc (total)

Attachment D – Table 5

Monitoring & Reporting Schedules

Task Description	Monitoring Period	Report Due Date
Quarterly water quality and general site monitoring	October 1 – December 31	January 31 of each year
	January 1 – March 31	April 30 of each year
	April 1 – June 30	July 31 of each year
	July 1 – September 30	October 31 of each year
October leachate analysis	October 1 – October 31	January 31 of the following year
April leachate retesting analysis	April 1 - April 30	August 1 of each year
Annual drainage control and maintenance	By October 1 of each year	December 31 of each year
Aerial or ground survey	By October 15 of each year	December 31 of each year
Annual summary	April 1 of previous year – March 31	April 30 of each year
COC analysis	January 1 – March 31, 2004	April 30, 2004
	July 1 – September 30, 2009	October 31, 2009 and every fifth year thereafter, alternately in the Spring (April 30) and Fall (October 31).

Attachment D – Table 6

LIST OF ANALYTICAL PARAMETERS AND METHODS

Parameter	USEPA Method*	Method Description	Container	Preservative
LIQUIDS MONITORING				
Ammonia as Nitrogen	350.1	Colorimetric, Automated, Phenate	Plastic	Cool, 4°C
Bicarbonate (HCO_3)	310.1	Titrimetric	Plastic	Cool, 4°C
Carbonate ($CaCO_3$)	310.1	Titrimetric	Plastic	Cool, 4°C
Chemical Oxygen Demand	410.4	Colorimetric	Plastic	Cool, 4°C
Chloride (Cl)	325	Ion Chromatography	Plastic	Cool, 4°C
pH	150.1	Electrometric	Plastic	Cool, 4°C
Nitrate (NO_3) As Nitrogen	353.2	Ion Chromatography	Plastic	Cool, 4°C
Sulfate (SO_4)	375	Ion Chromatography	Plastic	Cool, 4°C
Total Dissolved Solids (TDS)	160.1	Gravimetric	Plastic	Cool, 4°C
Calcium (Ca)	200.7/215	ICP/ ICP-MS	Plastic	Nitric Acid - 4°C
Iron (Fe)	200.7/236.1	ICP/ ICP-MS	Plastic	Nitric Acid - 4°C
Magnesium (Mg)	200.7/242.1	ICP/ ICP-MS	Plastic	Nitric Acid - 4°C
Manganese (Mn)	200.7/243.1	ICP/ ICP-MS	Plastic	Nitric Acid - 4°C
Potassium (K)	200.7/258.1	ICP/ ICP-MS	Plastic	Nitric Acid - 4°C
Sodium (Na)	200.7/273.1	ICP/ ICP-MS	Plastic	Nitric Acid - 4°C
Trace Metals	200 Series	ICP/ ICP-MS	Plastic	Nitric Acid - 4°C
SVOCs/ Herbicides/ Pesticides	8270	GC/ MS with Solid-phase Extraction	VOA Vial (Glass)	Hydrochloric Acid - 4°C
VOCs	8260	Purge and Trap GC/ MS	VOA Vial (Glass)	Hydrochloric Acid - 4°C
GAS MONITORING**				
Fixed Gases (CO_2, CH_4, N_2, O_2)	3 (Modified)	GC/FID	Tedlar Bag	Light-Sealed
VOCs	TO-14	GC/MS	Tedlar Bag	Light-Sealed

Attachment D - Table 7

COC-List 2

(To be attached when it is available)

The initial COC-List 2 shall consist of all Appendix II constituents detected in the first October annual leachate sample and confirmed in the following April leachate sample retest. The initial COC-List 2 shall be augmented by adding any newly detected Appendix II constituents found during subsequent annual leachate and April confirmation retest. An updated COC-List 2 shall be submitted by August 1 of each year.