CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2003-0146

WASTE DISCHARGE REQUIREMENTS
FOR
COUNTY OF TULARE
FOR
CONSTRUCTION, OPERATION, AND CLOSURE
VISALIA MUNICIPAL SOLID WASTE LANDFILL
TULARE COUNTY

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

1. The County of Tulare (hereafter Discharger) owns and operates a municipal solid waste landfill about seven miles northwest of Visalia, in the western one-half of Section 4, T18S, R24E, MDB&M, and the eastern one-half of Section 5, T18S, R24E, MDB&M as shown in Attachment A, which is incorporated herein and made part of this Order.

2. The facility, known as the Visalia Municipal Solid Waste Landfill, currently contains one existing unlined waste management unit (Unit) covering 127 acres, as shown in Attachment B, which is incorporated herein and made part of this Order. The facility is comprised of Assessor's Parcel Numbers (APN) 077-020-018, 077-020-021, 077-020-012, and 077-020-011.

3. The Discharger proposes to construct a new Unit at the facility for the discharge of municipal solid waste to an area of 115 acres east of and adjacent to the existing Unit. The new Unit will consist of ten separate expansion cells beginning with the Phase I cell. The proposed new Unit lies in APN 077-020-024 and 077-020-026.

4. On 30 April 1999, the Regional Board issued Order No. 99-047, which prescribes waste discharge requirements for the existing Unit. Order No. 99-047 classified the existing Unit as a Class III landfill that accepts municipal solid waste in accordance with Title 27, California Code of Regulations (CCR), Section 20005, et seq. This Order classifies the new Unit as a Class III landfill that accepts municipal solid waste in accordance with Title 27, CCR, Section 20005, et seq.

5. The facility is located on the westward dipping, eastern limb of the asymmetrical geosynclinal trough of the San Joaquin Valley. Sediments ranging in age from Jurassic to Holocene fill the geosynclinal trough. The site overlies a basement complex of pre-Tertiary age metasediments, plutonics, and ultramafics. Sequentially overlying the basement complex are approximately 1,000 to 3,500 feet of consolidated and unconsolidated Tertiary marine deposits, continental deposits, and unconsolidated Quaternary alluvium. Of

significance to the facility, are the unconsolidated alluvial fan deposits of the Kaweah River that occur above the continental deposits. The unconsolidated alluvial fan deposits consist of approximately 330 to 350 feet of interbedded clayey-silt, silt, and fine-to-medium-grain fluvial and flood basin sands. A 30-feet thick, low resistivity, hard clay and silt zone that may possibly represent the regionally extensive E-Clay, occurs between 180 and 210 feet below ground surface (bgs) beneath the western margin of the existing Unit and areas west of the existing Unit. The low-resistivity layer is laterally continuous and serves as an aquitard that separates groundwater into an unconfined Upper Alluvial Aquifer (above 180 feet bgs) and a Lower Alluvial Aquifer (below 210 feet bgs).

6. The measured hydraulic conductivity of the native soils underlying the Units range between 1×10^{-6} and 3×10^{-3} cm/sec.

7. The existing Unit and the proposed new Unit are not within a fault hazard zone. The closest Holocene faults are approximately 25 miles to the southeast near Lake Success. Recorded magnitudes of seismic events along these faults range between 4.5 and 4.9. The Coalinga Nose Fault is approximately 68 miles northwest of the facility. A seismic event along the Coalinga Nose Fault has a recorded magnitude of 6.7. The ground maximum acceleration associated with the maximum probable earthquake of the Coalinga Nose Fault is estimated to be 0.03 g. The Landers Fault, approximately 220 miles southeast of the facility, generated a magnitude 7.3 earthquake in 1992. The Landers Fault is considered to be the maximum probable earthquake associated with the Units based on studies by the Discharger, and was used to calculate the peak ground acceleration for the design of the Unit's containment structures. The ground maximum acceleration associated with the maximum probable earthquake of the Landers fault was calculated to be 0.11 g.

8. Land uses within 1,000 feet of the facility are agricultural.

9. The facility receives an average of 11.34 inches of precipitation per year as measured at the Exeter Station. The mean pan evaporation is 70.7 inches per year as measured at the Tulare Station.

10. The 100-year, 24-hour precipitation event is estimated to be 3.38 inches, based on Department of Water Resources' bulletin entitled *Rainfall Depth-Duration-Frequency for California*, revised November 1982, updated August 1986.

11. The facility is designated as Zone "B" (500-year flood zone) according to the National Flood Insurance Program Community Panel 065066, Flood Insurance Rate Map Panel 0475B.

12. There are 35 domestic and agricultural groundwater supply wells within one mile of the facility. No surface springs or other sources of groundwater supply have been observed.

WASTE AND SITE CLASSIFICATION

13. The Discharger discharges municipal solid wastes to the existing Unit and proposes to discharge municipal solid waste to the proposed new Unit. Municipal solid wastes are defined in Title 27 CCR Section 20164. Nonhazardous solid wastes includes municipal solid wastes, as referred to in the Code of Federal Regulations, Title 40, Part 258.2.

14. The site characteristics where the Units are located (see Finding No. 6) do not meet the siting criteria for a new Class III landfill contained in Title 27 CCR Sections 20260(a) and (b)(1). As such, the site is not suitable for operating new Units or lateral expansions of existing Units for the discharge and containment of Class III wastes as described in Finding No. 13, without the construction of additional waste containment features in accordance with Title 27 CCR Section 20260(b)(2) and State Water Resources Control Board Resolution No. 93-62 *Policy for Regulation of Discharges of Municipal Solid Waste*.

SURFACE AND GROUND WATER CONDITIONS

15. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition* (hereafter Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.

16. The facility is in a topographically flat region of the Tulare Lake Hydrologic Basin of the southern San Joaquin Valley. The designated beneficial uses of the surface waters of the valley floor, as specified in the Basin Plan, are agricultural supply, industrial service and process supply, water contact and non-contact water recreation, warm fresh water habitat, preservation of rare, threatened and endangered species, and groundwater recharge.

17. Surface drainage is toward Cross Creek in the Kaweah Delta Hydrologic Area (558.10) of the Tulare Lake Hydrologic Basin.

18. The St. Johns River is the nearest surface water body to the facility and is approximately one mile north of the facility. Facility operations should not impact the St. Johns River.

19. The first encountered groundwater ranges from about 50 feet below the native ground surface (bgs) at monitoring well M-6C to 56 feet bgs at monitoring well M-4B. Groundwater elevations range from 246 feet MSL at monitoring well M-6C to 233 feet MSL at monitoring well M-3B. The groundwater is unconfined. The depths to groundwater fluctuate seasonally as much as 15 feet.

20. Groundwater occurs in several zones beneath the facility. The uppermost groundwater zone (S-zone) exists between the 40 feet and 60 feet bgs. The S-zone is currently dry. The "A zone" exists between 80 feet and 100 feet bgs and the "B-zone" exists between 130 feet

and 150 feet bgs. The "S zone", "A zone", and the "B zone" together make up the Upper Alluvial Aquifer and are separated from deeper groundwater zones by a 30-feet thick, low resistivity, hard clay and silt zone that occurs between 180 and 210 feet bgs. The "C zone" or Lower Alluvial Aquifer, exists between 220 feet and 240 feet bgs and the "Deep zone" exists at depths deeper than 340 feet bgs.

21. The most recent monitoring data (Second Semi-Annual Monitoring Report, 2002) indicates background groundwater quality has an electrical conductivity (EC) ranging between 640 and 940 micromhos/cm, with total dissolved solids (TDS) ranging between 410 and 640 mg/l. The monitoring data also indicates that background groundwater quality contains concentrations of nitrates ranging between 78 and 130 mg/l.

22. The direction of groundwater flow is generally toward the southwest. The direction of groundwater flow varies seasonally and periodically flows between S20°W and S70°W. The average groundwater gradient ranges between approximately 0.002 and 0.005 feet per foot. The groundwater velocity is approximately 0.89 feet per day.

23. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are domestic and municipal, agricultural, and industrial supply.

GROUNDWATER MONITORING

24. A total of thirty-nine monitoring wells have been installed around and within the perimeter of the facility property (see Attachment B) with a total of 53 monitoring wells and observation wells installed within one mile of the existing Unit. The groundwater detection monitoring system currently used to detect releases from the existing Unit consists of downgradient wells M-2B, M-3B, M-4B, M-12, M-16S, and M-16A. The background groundwater monitoring system consists of wells M-6A, M-7A, and M-19S. Groundwater monitoring wells M-6B, M-7C, and M-19A will also be used to collect background groundwater data if the groundwater levels are lowered. When sufficient background groundwater data is collected from the M-19 monitoring well cluster, the M-6 monitoring well cluster will be replaced by the M-19 well cluster. The County proposes to install three groundwater monitoring wells along the proposed new Unit's southern boundary (see Attachment B). Since the proposed new Unit will be contiguous with the existing Unit, the groundwater monitoring wells along the new Unit's southern boundary will be used to detect any potential releases migrating to the south and southwest. The groundwater monitoring wells along the existing Unit's southern and western boundaries will be used to detect any releases from the proposed new Unit that migrate to the west, southwest, and south. The County's existing background groundwater monitoring wells will continue to be used for the collection of background groundwater data for the Units.

The current vadose zone detection monitoring system consists of seven landfill gas wells, G-1 through G-7, along the boundary of the existing Unit (see Attachment B). The vadose zone detection monitoring system for the proposed new Unit will consist of a pan lysimeter constructed with a geomembrane of sufficient thickness on a prepared subgrade below the leachate sump(s) and a portion of the leachate collection trench(es). The proposed new Unit's vadose zone detection monitoring system will also consist of landfill gas monitoring probes along its southern and eastern points of compliance (see Attachment B). The proposed additional landfill gas monitoring probes will be in addition to the landfill gas probes installed along the existing Unit's western boundary and between the existing and new Units.

25. The Discharger's detection monitoring program for groundwater at the Units satisfies the requirements contained in Title 27 CCR.

26. Volatile organic compounds (VOCs) are often detected in a release from a landfill, and are the primary waste constituents detected in groundwater beneath a municipal solid waste landfill (see Finding Nos. 31 and 32). Since volatile organic compounds are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a Unit.

27. Title 27 CCR Sections 20415(e)(8) and (9) provide for the non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a Unit in accordance with Title 27 CCR Section 20415(b)(1)(B)2.-4. However, Title 27 CCR does not specify a specific method for non-statistical evaluation of monitoring data.

28. The Regional Board may specify a non-statistical data analysis method pursuant to Title 27 CCR Section 20080(a)(1). Section 13360(a)(1) of the California Water Code allows the Regional Board to specify requirements to protect underground or surface waters from leakage from a solid waste site, which includes a method to provide the best assurance of determining the earliest possible detection of a release.

29. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a Unit, this Order specifies a non-statistical method for the evaluation of monitoring data.

30. The specified non-statistical method for evaluation of monitoring data provides two criteria (or triggers) for making the determination that there has been a release of non-naturally occurring waste constituents from a Unit. The presence of two non-naturally occurring waste constituents above their respective method detection limit (MDL), or one non-naturally occurring waste constituent detected above its practical quantitation limit (PQL),

indicates that a release of waste from a Unit has occurred. Following an indication of a release, verification testing will be conducted to determine whether there has been a release from the Unit, or there is a source of the detected constituents other than the facility, or the detection was a false detection. Although the detection of one non-naturally occurring waste constituent above its MDL is sufficient to provide for the earliest possible detection of a release, the detection of two non-naturally occurring waste constituents above the MDL as a trigger is appropriate due to the higher risk of false-positive analytical results and the corresponding increase in sampling and analytical expenses from the use of one non-naturally occurring waste constituent above its MDL as a trigger.

31. As a result of a 1985 groundwater investigation at the existing Unit, volatile organic compounds detected include: benzene; ethylbenzene; toluene; diethylphthalate; chloroform; 1,1,1-trichloroethane; tetrachloroethylene (PCE); trichloroethylene (TCE); trans-1,2-dichloroethene; 1,1-dichloroethane; C-14; A ketone; alkyl benzene; alkyl cyclohexane; alkyl propanoic acid; total complex matrix; an unidentified compound; and an unidentified aromatic. The naturally-occurring inorganic compounds detected above background levels include specific conductance (E.C.); total dissolved solids (TDS); alkalinity; barium; arsenic; chloride; hardness; iron; manganese; and sodium. The 1987 Solid Waste Water Quality Assessment Test (SWAT) report utilized the same groundwater analytical data generated during the 1985 groundwater investigation.

    Subsequent groundwater detection monitoring from 1992 through 2002 detected the volatile organic compounds PCE; TCE; trans-1,2-DCE; 1,2-DCA; 1,1-DCA; cis-1,2-DCE; 1,1-DCE; 1,2-DCE; 1,2-dichloropropane; trichlorofluoromethane; dichlorodifluoromethane; chloroform; vinyl chloride; methyl chloride; bromoethane; chloroethane; methylene chloride; acetone; methyl bromide; 1,1,1-trichloroethane; p-dichlorobenzene; o-dichlorobenzene; chlorobenzene; ethylbenzene; benzene; vinyl acetate; toluene; and xylenes. Acetone, methylene chloride, benzene, and 1,2-DCA have also been detected in field blanks, travel blanks, and laboratory methods blanks on more than one occasion and therefore, may not represent releases from the existing Unit. Carbon disulfide was detected in detection monitoring well M-3B and background monitoring well M-6B during one sampling event in 1995 and monitoring wells M-4A and M-10 in a 2001 sampling event. Tentatively identified organic compounds detected in one or more groundwater detection monitoring wells include: butane; Freon 113; chorodifluoromethane; di-isopropyl ether; ethyl tert-butyl ether; isopropylbenzene; methyl tert-butyl ether (MTBE); dichlorofluoromethane; cyclohexane; and 2-methylpropane.

    Statistical analysis indicates that arsenic; barium; chloride, potassium; TDS; bicarbonate; chromium; cobalt; iron; sodium; sulfide; calcium; manganese; magnesium; total organic carbon; and EC have exceeded their respective background concentration limits on one or more occasions in one or more groundwater detection monitoring wells.

32. An Evaluation Monitoring Program (EMP) was implemented in 1991. The VOCs detected as a result of EMP monitoring include: PCE; TCE; 1,1,1-TCA; cis-1,2-DCE; trans-1,2-DCE; 1,1-DCE; 1,1-DCA; 1,2-DCA; vinyl chloride; chloroethane; trichlorofluoromethane; dichlorodifluoromethane; 1,2-dichloropropane; chloroform; dibromochloromethane; bromodichloromethane; chlorobenzene; p-dichlorobenzene (1,4-DCB); o-dichlorobenzene (1,2-DCB); 2-butanone; acetone; benzene; ethylbenzene; toluene; and xylene. The non-chlorinated organic compounds: acrylonitrile; styrene; vinyl acetate; 1-propene; hexanal; and 3-methyl-butanal were detected on only one occasion. Benzene has also been detected in field blanks, travel blanks, and laboratory methods blanks on more than one occasion and therefore, may not represent releases from the existing Unit.

    Carbon disulfide was consistently detected in SimulProbe groundwater samples collected as a part of the EMP. Carbon disulfide concentrations ranged from trace values to 160 µg/l. Since the quantifiable detections of carbon disulfide: 1) are generally in the lower alluvial aquifer; 2) are not coincident with the distribution of total chlorinated VOCs; 3) have historically been detected in upgradient monitoring well M-6A (upper alluvial aquifer); 4) have been detected in boring EMP-12 that is upgradient of the WMU; 5) may be related to local agriculture since it is used as an agricultural fumigant; and 6) may be related to personal protective equipment since it is used in the manufacture of Latex, the source of the carbon disulfide does not appear to be the existing Unit.

    The predominant organic waste constituents detected as a result of EMP groundwater monitoring include: PCE; TCE; 1,1,1-TCA; cis-1,2-DCE; trans-1,2-DCE; 1,1-DCE; 1,1-DCA; 1,2-DCA; vinyl chloride; and chloroethane.

33. The vertical extent of VOC degradation appears to extend to the Deep zone in the vicinity of: the Van Grouw Dairy South Well (screened from 300 feet to 400 feet bgs) where low levels of PCE and dichlorodifluoromethane have been detected; abandoned agricultural well AG-13 (screened from 153 feet to 360 feet bgs) where PCE, TCE, cis-1,2-DCE, 1,1-DCA, and trichlorofluoromethane have been detected; and possibly in the vicinity of agricultural well AG-15 (screened from 201 feet to 371 feet bgs) where trace levels of PCE, TCE, and cis-1,2-DCE have been detected.

34. Volatile organic compound degradation in the S zone extends approximately 100 feet north of the existing Unit to monitoring well M-20 and immediately north of monitoring well M-10; from approximately 750 feet to 1,250 feet west of the existing Unit depending on location; from approximately 300 feet to 600 feet south of the existing Unit depending on location; and approximately 500 feet east of the existing Unit. The S zone is currently dry.

35. Volatile organic compound degradation in the A zone extends at least 1,900 feet west of the existing Unit; from approximately 350 feet to 750 feet south of the existing Unit depending on location; and approximately 450 feet east of the existing Unit's southeast corner.

36. Volatile organic compound degradation in the B zone extends at least 3,000 feet southwest of the existing Unit to boring EMP-26 and possibly as much as 3,300 feet southwest of the existing Unit to agricultural well AG-8; and from 300 feet to 750 feet south of the existing Unit depending on location.

37. Volatile organic compound degradation in the C zone possibly extends 2,300 feet southwest of the existing Unit to the Van Grouw Dairy South Well; and possibly as much as 850 feet south of the existing Unit's southwest corner.

38. The lateral extent of volatile organic compound degradation in groundwater deeper than the C zone appears to be localized around the Van Grouw Dairy South Well, the facility's former supply well, abandoned agricultural well AG-13, and possibly agricultural well AG-15.

39. Regional Board staff's 26 November 2002 memorandum contains maps showing the approximate lateral extents of VOC degradation in the aforementioned groundwater zones.

40. The vertical extent of TDS degradation in groundwater may extend to the C zone (220 feet to 240 feet) in the vicinity of monitoring well M-11C. The bulk of the TDS degradation appears to be in the Upper Alluvial Aquifer (S, A, and B zones) and extends approximately 900 feet west of the existing Unit; up to 750 feet south of the existing Unit depending on location; and approximately 250 feet southeast of the existing Unit's southeastern corner. Nitrate concentrations in the Upper and Lower Alluvial Aquifers were determined to be similar to or below background concentrations.

41. Cleanup and Abatement Order No. 99-718, adopted on 16 September 1999, directs the Discharger to complete an Evaluation Monitoring Program and establish a Corrective Action Program in accordance with a time schedule for the existing Unit.

42. The Discharger submitted a report entitled: *Interim Report, Phase 2 Evaluation Monitoring Program, Visalia Landfill, Tulare County* on 23 August 2002. The report contained the results of the Evaluation Monitoring Program. Regional Board staff reviewed the report and in a 26 November 2002 letter, deemed that the Evaluation Monitoring Program for the Visalia Landfill was complete and fulfilled the provisions of Title 27, CCR, Sections 20425(b) and 20005, et seq. and complied with Order No. 3 and Task 18.c of Cleanup and Abatement Order No. 99-718.

43. The Discharger submitted a report entitled: *Final Design Report (including the Basis of Design), Interim Groundwater Corrective Action Measure, Visalia Solid Waste Disposal Site, Visalia, California* on 15 August 2001 to address the remediation of degraded groundwater with total VOC concentrations of 100 µg/l and above (target zone), along the western boundary of the existing Unit. The Discharger submitted a report on 23 August 2002 entitled: *Engineering Feasibility Study Report, Visalia Landfill, Tulare County*, that proposed an expansion of the Interim Corrective Action Program (ICAP) in order to remediate high concentrations of VOCs within the Upper Alluvial Aquifer along the southern existing Unit boundary.

44. The ICAP consists of four groundwater extraction wells installed into the Upper Alluvial Aquifer along the existing Unit's western boundary and the proposal to install three groundwater extraction wells into the Upper Alluvial Aquifer along the southern existing Unit boundary. The treatment of the extracted groundwater from the Upper Alluvial Aquifer (target zone) consists of air stripping with the treated effluent water discharged to a borrow pit north and hydraulically upgradient of the existing Unit. Groundwater extraction along the western existing Unit boundary began in January 2003, but has not yet begun along the southern existing Unit boundary. Three groundwater extraction wells have been installed along the existing Unit's southern boundary. However, a region of low hydraulic conductivity in the A zone along the existing Unit's southern boundary significantly affects the extraction rate. Construction of the ICAP along the southern Unit boundary has been postponed indefinitely.

45. Regional Board staff reviewed the Discharger's 15 August 2001 *Final Design Report (including the Basis of Design), Interim Groundwater Corrective Action Measure, Visalia Solid Waste Disposal Site, Visalia, California*, and in a 10 September 2001 letter, informed the Discharger that the effectiveness of the proposed interim groundwater extraction well system in removing VOCs from the target zone and reducing the migration of VOCs to hydraulically downgradient receptors, would be evaluated as groundwater monitoring reports are submitted. Regional Board staff reviewed the Discharger's 23 August 2002 report and in a 23 December 2002 letter, informed the Discharger that the proposal to modify the ICAP to include the installation of three additional groundwater extraction wells along the existing Unit's southern boundary appeared adequate, but that the effectiveness of the modified ICAP in removing VOCs from the target zones along the western and southern existing Unit boundaries and reducing the migration of VOCs to hydraulically downgradient receptors, would be evaluated as groundwater monitoring reports are submitted.

46. The Discharger submitted a report entitled: *Updated Engineering Feasibility Study for Final Corrective Action, Visalia Solid Waste Disposal Site, Tulare County*, on 31 January 2003 that contained proposals for final corrective action measures in order to comply with

Order No. 6 of Cleanup and Abatement Order No. 99-718. The updated Engineering Feasibility Study for a Final Corrective Action Program was due 21 January 2002. In the 31 January 2003 report, the Discharger proposed source control measures, well abandonment, operation of the ICAP groundwater extraction system, natural attenuation of residual volatile organic compounds, and secondary capture and removal of degraded groundwater by agricultural well AG-9, as the final corrective action measures.

47. Regional Board staff reviewed the Discharger's 31 January 2003 updated Engineering Feasibility Study for a Final Corrective Action Program. Regional Board staff sent the Discharger a Notice of Violation on 20 May 2003 since the Engineering Feasibility Study for a Corrective Action Program was over 15 months late. Regional Board staff informed the Discharger in the 20 May 2003 Notice of Violation that the final corrective action measures proposed for the facility were not adequate since such corrective action measures would not ensure that constituents of concern in areas of groundwater that are not captured and remediated by the ICAP groundwater extraction system, would achieve their respective concentration limits at all monitoring points and throughout the zone affected by the release, including any portions thereof that extend beyond the facility boundary, by removing the waste constituents or treating them in place in accordance with Title 27 CCR, Section 20430(c). The Discharger was required to submit a revised Engineering Feasibility Study for a Final Corrective Action Program that includes measures to remove or treat in place waste constituents throughout each groundwater zone degraded by the release from the existing Unit.

48. On 12 June 2003, Regional Board staff met with the Discharger to discuss possible revisions to the Engineering Feasibility Study for a Final Corrective Action Program. The Discharger agreed to make some revisions to the Engineering Feasibility Study for a Final Corrective Action Program and resubmit it in July 2003. A revised Engineering Feasibility Study for a final Corrective Action Program was submitted by the Discharger on 25 July 2003 and is currently under review.

NEW UNIT LINER PERFORMANCE DEMONSTRATION

49. On 15 September 2000 the Regional Board adopted Resolution No. 5-00-213 *Request For The State Water Resources Control Board To Review The Adequacy Of The Prescriptive Design Requirements For Landfill Waste Containment Systems To Meet The Performance Standards of Title 27 CCR.* The State Board responded, in part, that "a single composite liner system continues to be an adequate minimum standard"; however, the Regional Board "should require a more stringent design in a case where it determines that the minimum design will not provide adequate protection to a given body of groundwater."

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

50. Reports entitled: *Amended Design Report, Response to Comments, Visalia Landfill, Phase I Construction* and *Base Liner Demonstration report*, *Visalia Landfill, Phase I Construction*, were submitted by the Discharger on 15 August 2002 and provided a performance demonstration for an engineered alternative liner design. The proposed liner system (in ascending order) consists of: 1) a six-inch thick prepared subgrade; 2) a secondary double non-woven geosynthetic clay liner (GCL); 3) a secondary double-textured 60-mil thick high-density polyethylene (HDPE) geomembrane; 4) a secondary tri-planar geocomposite leachate collection and removal system (LCRS) layer; 5) a one-foot thick protective clean soil layer; 6) a primary double non-woven GCL; 7) a primary double-textured 60-mil HDPE geomembrane; and 8) a primary LCRS to be placed atop the primary geomembrane and consisting of a tri-planar geocomposite drainage layer on which will be placed an HDPE geopipe network nestled in a gravel layer exhibiting a permeability of 1cm/sec or greater and wrapped by a non-woven geotextile filter fabric. A two-feet thick clean soil operations layer is proposed to be placed over the LCRS on the base of the new Unit and over the sideslope liner system. To protect the primary liner from damage, the Discharger proposes an operational constraint during placement of the first lift of wastes that consists of an inspector continuously observing and documenting first lift placement operations and noting any sharp turns, accelerations, or decelerations that could result in concentrated localized shears of the primary liner. The Discharger proposes to remove the operations layer and inspect the primary liner for damage at locations where concentrated localized shearing is suspected by the inspector.

    The Discharger states that the secondary LCRS will serve to intercept any leachate that may penetrate the primary liner system and greatly reduce the likelihood that a release of leachate to groundwater will occur. The Discharger also states that the one-foot thick protective clean soil layer separating the primary liner system from the secondary LCRS provides additional protection against wrinkling and rupturing of the secondary geomembrane during and after construction.

51. The proposed liner system consisting of secondary and primary composite liner systems, each equipped with a GCL and a 60-mil HDPE geomembrane, exceeds the hydraulic conductivity liner requirement contained in Title 27 CCR Section 30320(e) for a Class III landfill. The proposed double-composite liner systems combined with a double LCRS, provide for an overall containment system that meets the performance goal contained in Title 27 CCR Section 20310 for a Class III landfill.

NEW UNIT CONSTRUCTION AND ENGINEERED ALTERNATIVE LINER SYSTEM

52. On 17 June 1993, the State Water Resources Control Board adopted Resolution No. 93-62 implementing a State Policy for the construction, monitoring, and operation of municipal solid waste landfills that is consistent with the federal municipal solid waste regulations promulgated under Title 40, Code of Federal Regulations, Part 258 (Subtitle D).

53. Resolution No. 93-62 requires the construction of a specified composite liner system at new municipal solid waste landfills, or expansion areas of existing municipal solid waste landfills, that receive wastes after 9 October 1993.

54. Resolution No. 93-62 also allows the Regional Board to consider the approval of engineered alternatives to the prescriptive standard. Resolution No. 93-62 requires that the engineered alternative liner systems be of a composite design similar to the prescriptive standard (Section III.A.b.).

55. Title 27 CCR Section 20080(b) allows the Regional Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in accordance with Title 27 CCR Sections 20080(c)(1) and (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in Title 27 CCR Section 20080(b), or would be impractical and would not promote attainment of applicable performance standards. The Discharger must also demonstrate that the proposed engineered alternative liner system is consistent with the performance goal addressed by the particular prescriptive standard, and provides protection against water quality impairment equivalent to the prescriptive standard in accordance with Title 27 CCR Section 20080(b)(2).

56. Section 13360(a)(1) of the California Water Code allows the Regional Board to specify the design, type of construction, and/or particular manner in which compliance must be met in waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.

57. The Discharger proposes an engineered alternative liner system which will be designed, constructed, and operated in accordance with the criteria set forth in Title 27, and the provisions in State Water Resources Control Board Resolution No. 93-62 for municipal solid wastes.

58. The Discharger submitted a May 2000 *Report of Waste Discharge* requesting approval of an engineered alternative to liner requirements. The Discharger submitted a *Design Report* on 7 November 2001 containing draft plans, technical specifications, a construction quality assurance program, and design information for the Phase I expansion cell of the new Unit.

On 20 August 2002, the Discharger submitted an *Amended Design Report* that contained modifications to the Phase I expansion cell's liner system.

59. The engineered alternative liner system proposed by the Discharger in the *Amended Design Report* for the liner of the new Unit consists of, in ascending order: 1) a six-inch thick engineered subgrade that meets specific gradation and compaction criteria; 2) a secondary double non-woven geosynthetic clay liner (GCL); 3) a secondary double-textured 60-mil thick high-density polyethylene (HDPE) geomembrane; 4) a tri-planar geocomposite secondary LCRS layer; 5) a one-foot thick protective clean soil layer; 6) a primary double non-woven GCL; and 7) a primary double-textured 60-mil HDPE geomembrane. A primary LCRS is proposed to be placed atop the primary geomembrane consisting of a tri-planar geocomposite drainage layer on which will be placed an HDPE geopipe network nestled in a gravel layer exhibiting a permeability of 1cm/sec or greater and wrapped by a non-woven geotextile filter fabric. A two-foot thick clean soil operations layer will be placed over the primary LCRS of the bottom liner system.

60. The Discharger proposes to construct the side slope liners with the same materials and in the same sequence and manner as the bottom liner system. Prior to the discharge of waste to each new expansion cell, the operation soil layer is proposed by the Discharger to be placed ten feet up the side slopes by the construction contractor. Following the placement of the initial lift of refuse, the operation soil layer will continue to be placed on the side slope ahead of refuse placement.

61. The Discharger adequately demonstrated that construction of a Subtitle D prescriptive standard liner would be unreasonable and unnecessarily burdensome when compared to the proposed engineered alternative design. The soils underlying the site consist primarily of interbedded coarse sand, silty-sand, and sandy-silt. There are no known local sources of clay with low hydraulic conductivities to construct the prescriptive two-feet thick, 1×10^{-7} cm/sec secondary and primary liner systems. The Discharger performed an economic analysis to compare the costs of constructing the prescriptive double-composite liner system versus the proposed engineered alternative double-composite liner system. The results demonstrated that constructing the prescriptive double-composite liner system would cost substantially more than the engineered alternative double-composite liner system. The Discharger has demonstrated that the proposed engineered alternative is consistent with the performance goals of the prescriptive standard and affords at least equivalent protection against water quality impairment.

62. The proposed primary LCRS design for each expansion cell of the new Unit consists of a tri-planar geocomposite drainage layer placed on top of the primary geomembrane liner and extending to the top of each waste cell slope. A six-inch-diameter perforated HDPE main pipe surrounded by gravel exhibiting a permeability of 1 cm/sec or greater and wrapped in a

non-woven geotextile filter fabric will be placed in a trench down the center of each waste cell. The HDPE perforated main pipe will drain to a three-foot deep sump located at the low point of each waste cell on the east and west sides of the new Unit footprint. Each sump will be fitted with an automated submersible pump housed in a riser pipe accessible from the surface, and each sump will be filled with gravel. A two-foot thick clean soil operations layer will be placed over the primary LCRS of the bottom liner system. The proposed primary LCRS design for the Phase 1 expansion cell was analyzed using the Hydrologic Evaluation of Landfill Performance (HELP). The results of the HELP analysis determined that the maximum leachate head on the liner system would be less than one inch and that the maximum daily leachate generation rate would be approximately 126 gallons per acre per day.

63. The Discharger proposes to construct a secondary LCRS with a triplanar geocomposite and place it directly above the secondary geomembrane. The Discharger indicates that the secondary LCRS will serve to intercept, collect, and remove any liquid that penetrates the primary liner system. Liquids collected in the leachate detection system will drain via a gravel-filled trench down the center of each waste cell to a gravel-filled, dedicated leachate detection system sump where it will be removed to the surface by a submersible pump through a riser pipe.

64. Pan lysimeters will be installed for vadose zone monitoring. The pan lysimeters will consist of a geomembrane of sufficient thickness on a prepared subgrade below the leachate sump(s) and a portion of the leachate collection trench(es).

65. Construction will proceed only after all applicable construction design and quality assurance plans have been approved by Executive Officer.

CONSTRUCTION AND ENGINEERED ALTERNATIVE FINAL COVER SYSTEM

66. Title 27 CCR Section 21090 requires that closed landfills be provided with a cover system that consists of a minimum of two feet of appropriate materials as a foundation layer for the final cover; a barrier layer which consists of no less than one foot of soil on top of the foundation layer, which is compacted to attain a hydraulic conductivity of 1×10^{-6} cm/sec or less; and a soil cover not less than one foot thick on top of the barrier layer.

67. California Water Code Section 13360(a)(1) allows the Regional Board to specify the design, type of construction, and/or particular manner in which compliance must be met in waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.

68. The Discharger submitted a preliminary design plan for the closure of the existing Unit in a Preliminary Closure and Postclosure Maintenance Plan dated January 1996. The

preliminary design proposed the construction of the prescriptive standard landfill cover system specified in Title 27 CCR Section 21090. In a March 1998 report, the Discharger requested the option to use an engineered alternative landfill cover system. A Notice of Preparation of a Draft Environmental Impact Report was submitted on 25 May 2000 and stated that the Discharger proposed to close the existing Unit in accordance with State and Federal regulations as soon as the proposed new Unit becomes operational. The Notice of Preparation of a Draft Environmental Impact Report also proposed that the Postclosure Maintenance Plan would be in accordance with the plan provided in the facility's January 1996 Preliminary Closure and Postclosure Maintenance Plan. The 25 May 2000 Notice of Preparation of a Draft Environmental Impact Report stated that the existing Unit would be closed with a prescriptive final cover consisting of: a two-feet thick foundation layer; a low permeability compacted clay layer; and a one-foot thick vegetative layer. The Discharger states in the May 2000 Report of Waste Discharge that the Preliminary Closure and Postclosure Maintenance Plan for the existing Unit will be revised after the proposed new Unit is permitted for disposal operations and after its top deck has reached a minimum grade of five percent. A Final Closure and Postclosure Maintenance Plan for the existing Unit has not been submitted by the Discharger.

69. Although the Final Closure and Postclosure Maintenance Plan for the existing Unit has not been submitted, the Discharger submitted a proposal for an engineered alternative final cover system on 25 June 2003. The proposed final cover design consists of, in ascending order: 1) a two-feet thick soil foundation layer; 2) a GCL low-hydraulic conductivity layer; and 3) a two-feet thick vegetative layer. The Discharger's proposal also contained a schedule proposing a closure date of October 2006 for the existing Unit.

70. Title 27 CCR Section 20080(b) allows the Regional Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in accordance with Title 27 CCR Sections 20080(c)(1) and (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in Title 27 CCR Section 20080(b), or would be impractical and would not promote attainment of applicable performance standards**.**

71. The Discharger adequately demonstrated that construction of a Subtitle D prescriptive standard cover would be unreasonable and unnecessarily burdensome when compared to the proposed engineered alternative design. There is no source of clay on-site or nearby and the cost of importing clay from off-site would cost substantially more than the alternative design. The Discharger has demonstrated that the proposed engineered alternative is consistent with the performance goals of the prescriptive standard and affords equivalent protection against water quality impairment.

72. Construction of the existing Unit's final cover will proceed only after all applicable construction design and quality assurance plans, and a final closure plan have been approved by the Executive Officer.

73. Code of Federal Regulations, Title 40, Part 258.60(f), requires the owner or operator to begin closure activities of each Unit no later than 30 days after the date on which the Unit receives the known final receipt of wastes, or if the Unit has a remaining capacity and there is a reasonable likelihood that the Unit will receive additional wastes, no later than one year after the most recent receipt of wastes.

74. Code of Federal Regulations, Title 40, Part 258.60(g), requires the owner or operator to complete closure activities of each Unit in accordance with the closure plan within 180 days following the beginning of closure as specified in Code of Federal Regulations, Title 40, Part 258.60(f).

75. The new Unit will not be closed in absence of revised waste discharge requirements for closure.

CEQA AND OTHER CONSIDERATIONS

76. The Tulare County Resource Management Agency certified the final environmental impact report for the new Unit on 26 September 2001. The Tulare County Resource Management Agency filed a Notice of Determination on 25 September 2001 in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) and CEQA guidelines (14 CCR Section 15000 et seq.). The Regional Board considered the environmental impact report and incorporated mitigation measures from the environmental impact report into these waste discharge requirements designed to prevent potentially significant impacts to design facilities and to water quality.

    The proposed new Unit is in Zone "B" (500-year flood boundary). A significant impact to surface water may occur from the generation of degraded runoff water resulting from flood water contacting refuse. To mitigate the potential for flood water to contact refuse, the Discharger proposes to design all drainage control facilities to prevent the inundation of the new Unit by a 100-year, 24-hour storm event or lesser storm event.

    A significant impact to groundwater may occur due to the generation of leachate within the refuse. Leachate containing a variety of volatile organic compounds and inorganic waste constituents can migrate from the Unit and degrade underlying groundwater. To mitigate the potential for groundwater degradation by leachate, the Discharger proposes to construct the new Unit with a double-composite liner system, and a primary LCRS and secondary LCRS. Also, to minimize the generation of leachate within the refuse, the Discharger proposes to design all drainage control facilities to prevent the inundation of the new Unit

by a 100-year, 24-hour storm event or lesser storm event and cover refuse daily with six inches of daily cover soils and/or alternative daily cover materials. The Discharge also proposes to install groundwater detection monitoring wells at the Point of Compliance and pan lysimeters beneath the expansion cell LCRS sumps(s) and a portion of the leachate collection trench(es), to monitor for releases from the new Unit to groundwater.

A significant impact to groundwater may occur due to the migration of landfill gas from the new Unit. Landfill gas often contains a variety of VOCs. To mitigate the impacts of landfill gas on groundwater, the Discharger proposes to install an active landfill gas collection system to remove landfill gas from the refuse within the new Unit. The Discharger also proposes to install landfill gas monitoring probes at various depths around the perimeter of the new Unit to monitor the migration of landfill gas in the subsurface.

77. This order implements:

    a. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition*;

    b. The prescriptive standards and performance goals of Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions;

    c. The prescriptive standards and performance criteria of RCRA Subtitle D, Part 258; and

    d. State Water Resources Control Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993.

78. California Water Code Section 13267(b)(1) provides that: "In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged, or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of having discharged or discharging, or who proposed to discharge waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports…" The monitoring and reporting program required by this Order and the attached "Monitoring and Reporting Program No. R5-2003-0146" are necessary to assure

compliance with these waste discharge requirements. The Discharger operates the facility that discharges the waste subject to this Order.

PROCEDURAL REQUIREMENTS

79. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.

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

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

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

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order No. 99-047 is rescinded, and that the County of Tulare, its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of 'hazardous waste' or 'designated waste' is prohibited. For the purposes of this Order, the term 'hazardous waste' is as defined in Title 23, California Code of Regulations, Section 2510 et seq., and 'designated waste' is as defined in Title 27.

2. The discharge of wastes outside of a Unit or portions of a Unit specifically designed for their containment is prohibited.

3. The discharge of waste to a closed Unit is prohibited.

4. The discharge shall not cause the release of pollutants, or waste constituents in a manner which could cause a condition of nuisance, degradation, contamination, or pollution of groundwater to occur, as indicated by the most appropriate statistical or nonstatistical data analysis method and retest method listed in this Order, the Monitoring and Reporting Program, or the Standard Provisions and Reporting Requirements.

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

6. The discharge of liquid or semi-solid waste (e.g., waste containing less than 50 percent solids), except dewatered sewage or water treatment sludge above a composite liner as provided in Title 27 CCR Section 20220(c), is prohibited.

7. The discharge of solid waste containing free liquid or moisture in excess of the waste's moisture holding capacity is prohibited.

8. 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 Unit if such waste constituents could migrate to waters of the State — in either the liquid or the gaseous phase — and cause a condition of nuisance, degradation, contamination, or pollution.

9. The discharge of wastes which have the potential to reduce or impair the integrity of containment structures or which, if commingled with other wastes in the Unit, could produce a violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products, which in turn:

    a. require a higher level of containment than provided by the Unit; or

    b. are 'restricted hazardous wastes'; or

    c. impair the integrity of containment structures;

    is prohibited.

B. DISCHARGE SPECIFICATIONS

1. The discharge of nonhazardous wastes at this facility shall be limited to either:

    a. That portion of an existing unlined Unit that was permitted and/or received waste prior to the Federal Deadline of 9 October 1993; or

b. To a Unit equipped with a double-composite liner containment system which meets the requirements for both liners and leachate collection and removal systems as specified under D. Construction Specifications.

2. The discharge shall remain within the designated disposal area at all times.

3. A minimum separation of five feet shall be maintained between the base of the wastes and the highest anticipated elevation of underlying groundwater, including the capillary fringe.

4. Collected leachate shall be disposed of in accordance with Title 27 and in a manner consistent with its waste classification.

5. Condensate from the landfill gas control systems shall be disposed of in a manner consistent with the chemical characteristics of the wastes.

6. Neither the treatment nor the discharge of wastes shall cause a pollution or nuisance as defined by the California Water Code Section 13050.

7. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.

8. The waste discharged to the initial three feet of the new Unit, as measured from the top of the operations layer of the liner system, shall consist only of "packer waste", excluding waste that would pose a danger of physical damage to the liner system. The discharge of the first three feet of 'packer waste' to each expansion cell of the new Unit shall be continuously observed and documented by an appropriate inspector for 'spinouts' resulting from sharp turns and accelerations and decelerations that could cause localized damage to the primary liner system.

9. The operations layer shall be removed at locations where 'spinouts' or localized shear damage is suspected and the primary liner system inspected for damage. If the inspection of the primary liner system determines that it has been damaged, the Discharger shall immediately cordon off an area surrounding the damaged primary liner system, and within **48 hours** following the time of the observed primary liner damage notify the Regional Board. Within seven days of the observed primary liner damage, the Discharger shall submit a plan to repair the damaged primary liner in accordance with the approved Construction Quality Assurance Plan as per Construction Specification D.2.a.

C. FACILITY SPECIFICATIONS

1. Units and containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping as a result of a 100-year, 24-hour precipitation event.

2. Precipitation and drainage control systems shall be designed, constructed, and maintained to accommodate the anticipated volume of precipitation and peak flows from surface water runoff under the 100-year, 24-hour precipitation conditions.

3. The Discharger shall immediately notify the Regional Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.

4. Water maintained for facility maintenance shall be limited to the minimum amount necessary for dust control, construction, and, after closure, to the minimum amount necessary to irrigate cover vegetation or for other uses approved by the Executive Officer.

5. Cover materials shall be graded to divert precipitation from the Units, to prevent the ponding of surface water over wastes, and to resist erosion as a result of a 100-year, 24-hour precipitation event.

6. All drainage control systems shall be designed and constructed to prevent the ponding of water over wastes.

7. Surface drainage from tributary areas and internal site drainage from surface or subsurface sources shall not contact or percolate through wastes.

8. Units or portions of Units shall be designed, constructed, and operated in compliance with precipitation and flood control provisions and requirements contained in the Standard Provisions and Reporting Requirements referenced in Provision G.4 below.

9. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

10. Methane and other landfill gases shall be adequately vented, removed from the Unit, or otherwise controlled to prevent the danger of adverse health effects, nuisance conditions, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.

11. Surface drainage within the facility shall either be contained on-site or be discharged in accordance with applicable storm water regulations.

12. The Discharger shall maintain a *Storm Water Pollution Prevention Plan* and *Monitoring Program and Reporting Requirements* in accordance with State Water Resources Control Board Order No. 97-03-DWQ, or retain all storm water on-site.

13. Areas with slopes greater than ten percent, surface drainage courses, and areas subject to erosion by wind or water shall be designed and constructed to prevent such erosion.

14. A minimum thickness of six inches of on-site cover soil shall be maintained over all but the active disposal area of a Unit. This area shall be properly graded and drained to prevent ponding and infiltration. The active disposal area shall be confined to the smallest practicable area based on the anticipated quantity of waste discharge and other waste management operations, and shall be covered daily with a minimum of six inches of on-site soils, or an alternative daily cover material approved by the Executive Officer.

15. Annually, prior to **1 October** and **within 7 days** following a major storm event, all precipitation and drainage control systems shall be inspected. By **31 October** of each year, or **within 30 days** of a major storm event, any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the facility and to prevent surface drainage from contacting or percolating through wastes.

16. By **15 November of each year**, or within 45 days of a major storm event, the Discharger shall submit an annual report to the Regional Board describing the results of the inspection(s) and the measures taken to maintain the precipitation and drainage control systems.

17. The Discharger shall immediately notify the Regional Board of any flooding, unpermitted offsite discharge, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.

D. CONSTRUCTION SPECIFICATIONS

NEW UNIT CONSTRUCTION

1. The Discharger shall submit for Executive Officer review and approval either prior to, or concurrent with, submission of the Construction Quality Assurance Plan as per Construction Specification D.2.a., below, a Design Report for each expansion cell of

the proposed Unit that includes detailed plans, specifications, and descriptions for the liner components, leachate collection and removal system components, and leak detection system components. The Design Report shall incorporate design rationale, with supporting calculations, for all components of the proposed containment system, and shall describe design details that allow for annual integrity testing of the primary LCRS to demonstrate whether the primary LCRS was designed and is operating to function without clogging, pursuant to Title 27 CCR Section 20340(d).

2. The Discharger shall submit for Executive Officer review and approval **prior to** construction, design plans and specifications for each expansion cell of the proposed new Unit, that include the following:

    a. A Construction Quality Assurance Plan meeting the requirements of Title 27 CCR Section 20324; and

    b. A geotechnical evaluation of the area soils, evaluating their use as the base layer; and

    c. A vadose zone monitoring system that includes geomembrane-lined pan lysimeters installed beneath the leachate collection and removal system collection sump(s) and a portion of the leachate collection trench.

3. The liner system (both base and slopes) of each expansion cell of the new Unit shall be constructed in accordance with the following composite liner design:

    a. An engineered alternative composite liner system that is comprised, in ascending order, of the following:

        1) A minimum six-inch thick engineered soil foundation layer that shall be constructed of select soil materials, in accordance with the approved Construction Quality Assurance Plan that meet the following criteria:

            a) A maximum size of 1/2-inch, subrounded or rounded clasts;

            b) A gradation series (e.g., well-graded) that is amenable to compaction; and

            c) Recompacted and rolled smooth to at least 90% of maximum dry density and within 3% of optimum moisture content.

        2) A five mm-thick secondary geosynthetic clay layer consisting of sodium bentonite sandwiched between two non-woven geotextiles.

3) A secondary 60-mil thick double-textured synthetic flexible membrane of high-density polyethylene (HDPE).

4) A tri-planar geocomposite secondary LCRS.

5) A one-foot thick protective clean soil layer.

6) A primary non-woven geosynthetic clay layer.

7) A primary 60-mil thick double-textured HDPE synthetic flexible membrane.

8) A tri-planar geocomposite primary LCRS.

9) A two-feet thick operations layer over the primary LCRS of the bottom liner system and over the side slope liner system.

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

5. The LCRS shall be designed and operated so that there is no buildup of hydraulic head on the base or side slope liner systems.

6. Construction shall proceed only after all applicable construction design and quality assurance plans have been approved by Executive Officer.

7. Following the completion of construction of each cell of the new Unit, and prior to discharge onto the newly constructed liner system, the final documentation required in Title 27 CCR Section 20324(d)(1)(C) shall be submitted to the Executive Officer for review and approval. The report shall be certified by a registered civil engineer or a certified engineering geologist. It shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, and with the prescriptive standards and performance goals of Title 27.

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

9. If monitoring reveals substantial or progressive increases of leachate generation above the design leachate flow volume of 126 gallons per day per acre (see Finding No. 62) by an expansion cell of the new Unit, such that the depth of fluid on any portion of the LCRS (excluding the leachate removal pump sump) exceeds 30 cm, the Discharger shall immediately notify the Regional Board in writing within seven days. The notification shall include a timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.

EXISTING UNLINED UNIT CLOSURE

10. **At least six months prior to the date of the known final receipt of waste at the Unit**, the Discharger shall submit the Final Closure and Postclosure Maintenance Plans for the existing Unit.

11. Materials used to construct the cover system shall have appropriate physical and chemical properties to ensure containment of discharged wastes over the closure and postclosure maintenance period of the existing Unit.

12. The Discharger shall submit for review and approval by the Executive Officer **prior to construction**, construction and design plans and specifications for the cover system that include the following:

    a. A Construction Quality Assurance Plan meeting the requirements of Title 27 CCR Section 20324; and
    b. A geotechnical evaluation of the area soils, evaluating their use as the foundation layer.

13. The engineered alternative final cover system shall be constructed in accordance with the following cover design that is comprised, in ascending order, of the following:

    a. A two-foot thick engineered foundation layer comprised of soils compacted to a minimum relative compaction of 90% and prepared in an appropriate manner using accepted engineering and construction methods so as to provide a smooth surface that is free from rocks, sticks, or other debris that could damage or otherwise limit the performance of the GCL;

    b. A geosynthetic clay liner (GCL) that exhibits appropriate strength characteristics to accommodate stresses associated with the specific cover design parameters;

    c. A two-foot thick vegetative cover layer that meets the Title 27 CCR closure regulations.

14. The Discharger may propose changes to the cover system design prior to the construction, provided that approved components are not eliminated, the engineering properties of the components are not substantially reduced, and the proposed cover system results in the protection of water quality equal to or greater than the design prescribed by Title 27 CCR and this Order. The proposed changes may be made following approval by the Executive Officer. Substantive changes to the design require reevaluation as an engineered alternative and approval by the Regional Board.

15. Hydraulic conductivities of cover materials shall be determined by laboratory tests using water. Hydraulic conductivities determined through laboratory methods shall be confirmed by field testing in accordance with the Standard Provisions and Reporting Requirements, Construction Specifications VIII.J.

16. Following the completion of construction of the cover system, a construction report shall be submitted for Executive Officer review and approval. The report shall be certified by a registered civil engineer or a certified engineering geologist. It shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, and with the prescriptive standards and performance goals of Title 27 CCR. The cover construction report shall include as a minimum, but not be limited to, the following:

    a. Test results on the chemical and geotechnical properties of materials used in the cover system, as specified in these waste discharge requirements.

    b. Test results on the hydraulic conductivity of the cover system.

    c. Construction quality assurance and quality control procedures and results for all aspects of cover system construction.

17. Construction shall proceed only after the Final Closure and Postclosure Maintenance Plans and all applicable construction quality assurance plans and a slope stability analysis for the engineered final cover system described in Construction Specifications D.10 and D.12, have been approved by the Executive Officer.

18. The CQA Program shall be supervised by a registered civil engineer or certified engineering geologist who shall be designated the CQA officer. The CQA officer and personnel performing monitoring and testing shall be independent of the construction contractor and the Discharger.

19. Partial or final closure of the new Unit shall be in compliance with the applicable provisions of Title 27 and in accordance with the approved Final Closure and

Postclosure Maintenance Plan and closure waste discharge requirements adopted by the Regional Board. The Discharger shall notify the Regional Board in writing of the waste management unit(s) or portion of waste management unit(s) to be closed at least **180 days** prior to the intended beginning of any partial or final closure activities. Closure shall not proceed in the absence of closure waste discharge requirements.

E. DETECTION MONITORING SPECIFICATIONS

1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with Monitoring and Reporting Program No. R5-2003-0146. For a new Unit, background analytical data shall be collected for a period of one year prior to the discharge of waste in order to establish background values for each constituent of concern and monitoring parameter and to select the appropriate data analysis method [Title 27 CCR Section 20415(e)(6)].

2. The Discharger shall provide Regional Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation or abandonment of monitoring devices, and a minimum **48 hour** notification prior to the collection of samples associated with a detection monitoring program, evaluation monitoring program, or corrective action program.

3. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, Monitoring and Reporting Program No. R5-2003-0146, and the Standard Provisions and Reporting Requirements, dated April 2000.

4. The Water Quality Protection Standard for organic compounds which are not naturally occurring and not detected in background groundwater samples shall be taken as the detection limit of the analytical method used (i.e., US-EPA methods 8260 and 8270). The repeated detection of one or more non-naturally occurring organic compounds in samples above the Water Quality Protection Standard from detection monitoring wells is evidence of a release from the Unit.

5. The concentrations of the naturally occurring waste constituents of concern in waters passing the Point of Compliance shall not exceed the concentration limits established pursuant to Monitoring and Reporting Program No. R5-2003-0146.

6. For each monitoring event, the Discharger shall determine whether the facility is in compliance with the Water Quality Protection Standard using procedures specified in Monitoring and Reporting Program No. R5-2003-0146 and Title 27 CCR Section 20415(e).

7. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless the Executive Officer approves a longer time period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) Methods for the Analysis of Organics in Water and Wastewater (USEPA 600 Series), (2) Test Methods for Evaluating Solid Waste (SW-846, latest edition), and (3) Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan.

8. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology shall be submitted for review and approval by the Executive Officer prior to use.

9. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., "trace" or "ND") in data from background monitoring points for that medium, the analytical method having the lowest method detection limit (MDL) shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.

10. **"Trace" results** - results falling between the MDL and the practical quantitation limit (PQL) - shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run.

11. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs.

12. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with estimates of the detection limit and quantitation limit actually

achieved. The **MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result**. The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.

13. All **QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.

14. Unknown chromatographic peaks shall be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.

15. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Title 27 CCR Section 20415(e)(7) that is used in the statistical method shall be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the WDRs for routine laboratory operating conditions that are available to the facility. The Discharger's technical report, pursuant to Title 27 CCR Section 20415(e)(7), shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, CCR, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or nonstatistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties".

16. Background for water samples or soil-pore gas samples shall be represented by the data from all samples taken from applicable background monitoring points during that reporting period (at least one sample from each background monitoring point). The Discharger may propose an alternate statistical method [to the methods listed under Title 27 CCR Section 20415(e)(8)(A-D)] in accordance with Title 27 CCR Section 20415(e)(8)(E), for review and approval by the Executive Officer.

17. The Discharger may propose an alternate statistical method [to the methods listed under Title 27 CCR Section 20415(e)(8)(A-D)] in accordance with Title 27 CCR Section 20415(e)(8)(E), for review and approval by the Executive Officer. Upon receiving written approval from the Executive Officer, alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate). Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Regional Board staff.

18. The Discharger shall use the following non-statistical method for all for analytes (non-naturally occurring waste constituents) that are detected in fewer than 10% of the background samples. The non-statistical method shall be implemented as follows:

    a. From the constituent of concern or monitoring parameter list, identify each analyte in the **current** sample that exceeds either its respective MDL or PQL. The Discharger shall conclude that the exceedance provides a preliminary indication of a release or a change in the nature or extent of the release, at that monitoring point, if ***either:***

        1) The data contains two or more analytes that are detected in fewer than 10% of background samples that equal or exceed their respective MDLs; or

        2) The data contains one or more analyte that equals or exceeds its PQL.

    b. **Discrete Retest** [Title 27 CCR Section 20415(e)(8)(E)]:

        1) In the event that the Discharger concludes (pursuant to paragraph 18.a, above) that there is a preliminary 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 monitoring point where the release is preliminarily indicated.

2) For any given retest sample, the Discharger shall include, in the retest analysis, **only the laboratory analytical results for those analytes detected in the original sample**. As soon as the retest data are available, the Discharger shall conclude that there is measurably significant evidence of a release if two or more analytes equal or exceed their respective MDLs or if one or more analyte equals or exceeds its PQL and shall:

a) **Immediately** notify the Regional Board about any constituent or constituents verified to be present at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of validation; and

b) Comply with 18.b.3, below if any constituent or constituents were verified to be present.

3) Any analyte that triggers a discrete retest per this method shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event.

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

F. REPORTING REQUIREMENTS

1. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Regional Board office by telephone **as soon as** it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.

2. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the postclosure period.

Such legible records shall show the following for each sample:

a. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;

b. Date, time, and manner of sampling;

c. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;

d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;

e. Calculation of results; and

f. Results of analyses, and the MDL and PQL for each analysis.

3. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report.

4. Each monitoring report shall include a compliance evaluation summary. The summary shall contain at least:

   a. For each monitoring point and background monitoring point addressed by the report, a description of:

      1) The time of water level measurement;

      2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;

      3) The method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the

purge water) to remove all portions of the water that was in the well bore while the sample was being taken;

4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and

5) A statement that the sampling procedure was conducted in accordance with the approved Sampling and Analysis Plan.

b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.

c. For each groundwater body, a description and graphical presentation of the gradient and direction of groundwater flow under/around the Unit, and the groundwater flow rate, based upon water level elevations taken prior to the collection of the water quality data submitted in the report.

d. Laboratory statements of results of all analyses evaluating compliance with requirements.

e. An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities.

f. A summary and certification of completion of all **Standard Observations** for the Unit(s), for the perimeter of the Unit, and for the receiving waters. The Standard Observations shall include:

1) For the Unit:

a) Evidence of ponded water at any point on the facility (show affected area on map);

b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and

c) Evidence of erosion and/or of day-lighted refuse.

2) Along the perimeter of the Unit:

a) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);

b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and

c) Evidence of erosion and/or of day-lighted refuse.

g. The quantity and types of wastes discharged and the locations in the Unit where waste has been placed since submittal of the last such report.

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

a. A map showing the location(s) of seepage;

b. An estimate of the flow rate;

c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);

d. Verification that samples have been submitted for analyses of the Constituents of Concern and Monitoring Parameters, and an estimated date that the results will be submitted to the Regional Board; and

e. Corrective measures underway or proposed, and corresponding time schedule.

6. The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional Board covering the reporting period of the previous monitoring year. This report shall contain:

a. All detected monitoring parameters and constituents of concern shall be graphed so as to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for all monitoring points and background monitoring points, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot downgradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.

b. Unless otherwise exempted by the Executive Officer, all monitoring analytical data obtained during the previous two six-month reporting periods, shall be

submitted in tabular form as well as in a digital file format acceptable to the Executive Officer. The Regional Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27 CCR Section 20420(h)], in that this facilitates periodic review by the Regional Board.

c. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.

d. A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours.

e. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.

f. An evaluation of the effectiveness of the leachate monitoring/control facilities.

G. PROVISIONS

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

2. The Discharger shall comply with all applicable provisions of Title 27 and 40 Code of Federal Regulations Part 258 (Subtitle D) that are not specifically referred to in this Order.

3. The Discharger shall comply with Monitoring and Reporting Program No. R5-2003-0146, which is incorporated into and made part of this Order.

4. The Discharger shall comply with the applicable portions of the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (Title 27 CCR Section 20005 et seq. and 40 CFR 258 et seq.)*, dated April 2000, which are hereby incorporated into this Order.

5. All reports and transmittal letters shall be signed by persons identified below:

   a. For a corporation: by a principal executive officer of at least the level of senior vice-president.

b. For a partnership or sole proprietorship: by a general partner or the proprietor.

c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.

d. A duly authorized representative of a person designated in a, b or c above if;

1) The authorization is made in writing by a person described in a, b, or c of this provision;

2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

3) The written authorization is submitted to the Regional Board.

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

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

6. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.

7. The owner of the facility shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and from gases and leachate generated by discharged waste during the active life, closure, and postclosure maintenance period of the Unit(s) and during subsequent use of the property for other purposes.

8. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of the Order.

9. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Regional Board requesting transfer of the Order within 14 days of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Regional Board, and a statement. The statement shall comply with the signatory requirements contained in Provision G.5. and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer of this Order shall be approved or disapproved by the Regional Board.

10. The Discharger shall establish cost estimates for initiating and completing corrective action for all known or reasonably foreseeable releases from the facility, and submit these estimates to the Executive Officer for review and approval.

11. The Discharger shall obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known or reasonably foreseeable releases from the facility in an amount approved by the Executive Officer, and shall submit the financial assurance mechanism to the Financial Assurances Section of the California Integrated Waste Management Board.

12. The Discharger is required to maintain financial assurance mechanisms for closure and post-closure maintenance costs as specified in Chapter 6 of Title 27. The Discharger is required to submit the financial assurance mechanism to the Financial Assurances Section of the California Integrated Waste Management Board, which determines if the mechanism meets the requirements of Chapter 6, Title 27, and if the amount of coverage is adequate.

13. The Discharger shall complete the tasks contained in these waste discharge requirements in accordance with the following time schedule:

	Task	Compliance Date
a.	Construction Plans (New Unit)	
	Submit construction and design plans and specifications for Executive Officer review and approval. (see Construction Specifications D.1 and D.2)	**Prior to construction**

Task	Compliance Date
b. Construction Report	
Submit a construction report upon completion demonstrating construction was in accordance with approved construction plans for Executive Officer review and approval. (see Construction Specification D.7)	**Prior to discharge**
c. Final Closure Plans (Existing Unit)	
1) Submit Final Closure and Postclosure Maintenance Plans (Construction Specifications D.10)	**Six months prior to date of known final receipt of waste at the Unit**
2) Submit construction and design plans and specifications for Executive Officer review and approval. (see Construction Specification D.12)	**Prior to construction**
d. Construction Report	
Submit a construction report upon completion demonstrating construction was in accordance with approved construction plans for Executive Officer review and approval. (see Construction Specification D.16)	**Following completion of construction of final cover system**
e. Completion of Closure	**1 December 2006**
f. Annual Monitoring Summary Report	
Submit an Annual Monitoring Summary Report to the Regional Board covering the reporting period of the previous monitoring year. (Reporting Requirement F.6)	**By 31 January of each year**

Task		Compliance Date
g.	Financial Assurance Review	
1)	Annual Review of Financial Assurance for initiating and completing corrective action (see Provision G.11.)	**By 1 October each year**
2)	Annual Review of Financial Assurance for closure and postclosure maintenance (see Provision G.12.)	**By 1 October each year**

I, THOMAS R. PINKOS, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 5 September 2003.

original signed by

_____

THOMAS R. PINKOS, Executive Officer

VSM:vsm/rac

CALIFORNIA REGIONAL WATER QUALITY CONTROL REGIONAL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2003-0146
FOR
COUNTY OF TULARE
FOR
CONSTRUCTION, OPERATION, AND CLOSURE
VISALIA MUNICIPAL SOLID WASTE LANDFILL
TULARE COUNTY

Compliance with this Monitoring and Reporting Program, with Title 27, California Code of Regulations, Section 20005, et seq. (hereafter Title 27), and with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258),* dated April 2000, is ordered by Waste Discharge Requirements Order No. R5-2003-0146.

A. REQUIRED MONITORING REPORTS

	Report	Due
1.	Groundwater Monitoring (Section D.1)	**See Table I**
2.	Annual Monitoring Summary Report (Order No. R5-2003-0146, F.6.)	**Annually**
3.	Unsaturated Zone Monitoring (Section D.2)	**See Table II**
4.	Leachate Monitoring (Section D.3)	**See Table III**
5.	Facility Monitoring (Section D.4)	**As necessary**
6.	Response to a Release (Standard Provisions and Reporting Requirements)	**As necessary**

B. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in Order No. R5-2003-0146 and the Standard Provisions and Reporting Requirements. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in

noncompliance with the waste discharge requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format acceptable to the Executive Officer.

Each monitoring report shall include a compliance evaluation summary as specified in F. Reporting Requirements, of Order No. R5-2003-0146.

Field and laboratory tests shall be reported in each monitoring report. Monthly, quarterly, semiannual, and annual monitoring reports shall be submitted to the Regional Board in accordance with the following schedule for the calendar period in which samples were taken or observations made.

Sampling Frequency	Reporting Frequency	Reporting Periods End	Report Date Due
Monthly	Quarterly	Last Day of Month	**by Semiannual Schedule**
Quarterly	Quarterly	31 March	**31 July**
		30 June	**31 July**
		30 September	**31 January**
		31 December	**31 January**
Semiannually	Semiannually	30 June	**31 July**
		31 December	**31 January**
Annually	Annually	31 December	**31 January**

The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional Board covering the previous monitoring year. The annual report shall contain the information specified in F. Reporting Requirements, of Order No. R5-2003-0146, and a discussion of compliance with the waste discharge requirements and the Water Quality Protection Standard.

The results of **all monitoring** conducted at the site shall be reported to the Regional Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For each waste management unit (Unit), the Water Quality Protection Standard shall consist of all constituents of concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the constituents of concern, the concentration limits, and the point of compliance and all monitoring points. The Executive Officer shall review and approve the Water Quality Protection Standard, or any modification thereto, for each monitored medium.

The report shall:

a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a Unit or portion of a Unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.

b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with Title 27 CCR Section 20405.

c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

2. Constituents of Concern

The constituents of concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The constituents of concern for all Units at the facility are those listed in Tables I through III for the specified

monitored medium, and Table V. The Discharger shall monitor all constituents of concern every five years, or more frequently as required in accordance with a Corrective Action Program.

a. **Monitoring Parameters**

Monitoring parameters are constituents of concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for all Units are those listed in Tables I through III for the specified monitored medium and Table IV.

3. Concentration Limits

Pursuant to Title 27 CCR Section 20415(e)(10)(B), for each naturally occurring inorganic constituent of concern, the concentration limit (applicable suite of background data) for that constituent shall be redetermined each semiannual monitoring period according to the following "moving window" formula, and the Discharger shall use the resulting concentration limit to apply the parametric Interwell Upper Prediction Limit analysis method featured in the Sanitas™ for Groundwater statistical software package, unless the software indicates that a different method (e.g., the nonparametric version of the same method) is more appropriate. For each reporting period subsequent to the initial reporting period, the Discharger shall create the new concentration limit, for that constituent, by taking the prior reporting period's background data, adding the newest datum, for that constituent, from background monitoring wells M-6A or B, or M-7A or C, or M-19S or A and removing the oldest datum.

4. Point of Compliance

The point of compliance for the water standard at each Unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

5. Compliance Period

The compliance period for each Unit shall be the number of years equal to the active life of the Unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the Unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program.

D. MONITORING

The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater and the unsaturated zone, in accordance with Detection Monitoring Specifications of Waste Discharge Requirements, Order No. R5-2003-0146. For a new Unit, background analytical data shall be collected for a period of one year prior to the discharge of waste in order to establish background values for each constituent of concern and monitoring parameter and to select the appropriate data analysis method [Title 27 CCR Section 20415(e)(6)]. All monitoring shall be conducted in accordance with a Sample Collection and Analysis Plan, which includes quality assurance/quality control standards, that is acceptable to the Executive Officer.

All point of compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, and leachate monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern as indicated and listed in Tables I through III.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those which cannot be quantified and/or specifically identified. Metals shall be analyzed in accordance with the methods listed in Table V.

The Discharger may, with the approval of the Executive Officer, use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

1. Groundwater

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Title 27 CCR Sections 20415 and 20420 in accordance with a Detection Monitoring Program approved by the Executive Officer. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

The Discharger shall determine the groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional zone of saturation monitored pursuant to this Monitoring and Reporting Program, and report the results semiannually, including the times of highest and lowest elevations of the water levels in the wells.

A groundwater contour map and tabular data shall be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. The groundwater contour map and tabular data shall be prepared quarterly and submitted annually.

Groundwater samples shall be collected from the point-of-compliance wells, background wells, and any additional wells added as part of the approved groundwater monitoring system. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table I.

The monitoring parameters shall also be evaluated annually with regards to the cation/anion balance, and the results shall be graphically presented using a Stiff diagram, a Piper graph, or a Schueller plot. Samples for the constituents of concern specified in Table I shall be collected and analyzed in accordance with the methods listed in Table V every five years.

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of Title 27 CCR Sections 20415 and 20420 in accordance with a detection monitoring plan approved by the Executive Officer. The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the approved Sample Collection and Analysis Plan.

Unsaturated zone samples shall be collected from the monitoring devices and background monitoring devices of the approved unsaturated zone monitoring system. The collected samples shall be analyzed for the listed constituents in accordance with the methods and frequency specified in Table II. All monitoring parameters shall be graphed so as to show historical trends at each monitoring point. Samples for the constituents of concern specified in Table II shall be collected and analyzed in accordance with the methods listed in Table V every five years.

The pan lysimeters shall be checked monthly for liquid and monitoring shall also include the total volume of liquid removed from the system. Unsaturated zone monitoring reports shall be included with the corresponding semiannual groundwater monitoring and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

3. Leachate Monitoring

All Unit leachate collection and removal system sumps shall be inspected monthly for leachate generation. Upon detection of leachate in a previously dry leachate collection and removal system, leachate shall be sampled **immediately** and analyzed for the constituents listed in Table III. Leachate shall then be sampled and analyzed annually during the fourth quarter thereafter, with a retest during the following second quarter if constituents are detected that have not been previously detected. Leachate samples shall be collected and analyzed for the listed constituents in accordance with the methods and frequency specified in Table III. The constituents of concern list shall include all constituents listed in Table V. The quantity of leachate pumped from each sump shall be measured and reported monthly as Leachate Flow Rate (in gallons).

Leachate which seeps to the surface from the Unit shall be sampled and analyzed for the constituents listed in Table III upon detection. The quantity of leachate shall be *estimated* and reported as Leachate Flow Rate (in gallons/day).

4. Facility Monitoring

a. **Facility Inspection**

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the drainage control system, groundwater monitoring equipment (including wells, etc.), and shall include the Standard Observations contained in section F.4.f. of Order No. R5-2003-0146. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. By **15 November** of each year, the Discharger shall submit an annual report describing the results of the inspection and the repair measures implemented, including photographs of the problem and the repairs.

b. **Storm Events**

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following *major storm events*. Necessary repairs shall be completed **within 30 days** of the inspection. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and the repairs.

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

original signed by

Ordered by:_____
THOMAS R. PINKOS, Executive Officer

5 September 2003
(Date)

VSM:vsm/rac

TABLE I

GROUNDWATER DETECTION MONITORING PROGRAM

Parameter	Units	Frequency
Field Parameters		
Groundwater Elevation	Ft. & hundredths, M.S.L.	Quarterly
Temperature	^{o}C	Semiannual
Electrical Conductivity	µmhos/cm	Semiannual
pH	pH units	Semiannual
Turbidity	Turbidity units	Semiannual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semiannual
Chloride	mg/L	Semiannual
Carbonate	mg/L	Semiannual
Bicarbonate	mg/L	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual
Sulfate	mg/L	Semiannual
Calcium	mg/L	Semiannual
Magnesium	mg/L	Semiannual
Potassium	mg/L	Semiannual
Sodium	mg/L	Semiannual
Volatile Organic Compounds (USEPA Method 8260, see Table IV)	µg/L	Semiannual
Constituents of Concern (see Table V)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE II

UNSATURATED ZONE DETECTION MONITORING PROGRAM

SOIL-PORE GAS

Parameter	Units	Frequency
Monitoring Parameters		
Volatile Organic Compounds (USEPA Method TO-14)	µg/cm^3	Semiannual
Methane	%	Semiannual

PAN LYSIMETER

Parameter	Units	Frequency
Field Parameters		
Electrical Conductivity	µmhos/cm	Semiannual
pH	pH units	Semiannual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semiannual
Chloride	mg/L	Semiannual
Carbonate	mg/L	Semiannual
Bicarbonate	mg/L	Semiannual
Nitrate - Nitrogen	mg/L	Semiannual
Sulfate	mg/L	Semiannual
Calcium	mg/L	Semiannual
Magnesium	mg/L	Semiannual
Potassium	mg/L	Semiannual
Sodium	mg/L	Semiannual
Volatile Organic Compounds (USEPA Method 8260B, see Table IV)	µg/L	Semiannual
Constituents of Concern (see Table V)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years

TABLE II

UNSATURATED ZONE DETECTION MONITORING PROGRAM

Continued

Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE III

LEACHATE DETECTION MONITORING PROGRAM

Parameter	Units	Frequency
Field Parameters		
Total Flow	Gallons	Monthly
Flow Rate	Gallons/Day	Monthly
Electrical Conductivity	µmhos/cm	Monthly
pH	pH units	Monthly
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Annually
Chloride	mg/L	Annually
Carbonate	mg/L	Annually
Bicarbonate	mg/L	Annually
Nitrate - Nitrogen	mg/L	Annually
Sulfate	mg/L	Annually
Calcium	mg/L	Annually
Magnesium	mg/L	Annually
Potassium	mg/L	Annually
Sodium	mg/L	Annually
Volatile Organic Compounds (USEPA Method 8260B, see Table IV)	µg/L	Annually
Constituents of Concern (see Table V)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE IV

MONITORING PARAMETERS FOR DETECTION MONITORING

Surrogates for Metallic Constituents:

pH
Total Dissolved Solids
Electrical Conductivity
Chloride
Sulfate
Nitrate nitrogen

Constituents included in VOC:

USEPA Method 8260B
Acetone
Acrylonitrile
Benzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- l ,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC-12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
2-Hexanone (Methyl butyl ketone)
Hexachlorobutadiene

TABLE IV

MONITORING PARAMETERS FOR DETECTION MONITORING

Continued

Hexachloroethane
Methyl bromide (Bromomethene)
Methyl chloride (Chloromethane)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl ethyl ketone (MEK: 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
4-Methyl-2-pentanone (Methyl isobutylketone)
Naphthalene
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1.2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloethane (Methylchloroforrn)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride
Xylenes

TABLE V

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Inorganics (dissolved):	**USEPA Method**
Aluminum	6010
Antimony	7041
Barium	6010
Beryllium	6010
Cadmium	7131A
Chromium	6010
Cobalt	6010
Copper	6010
Silver	6010
Tin	6010
Vanadium	6010
Zinc	6010
Iron	6010
Manganese	6010
Arsenic	7062
Lead	7421
Mercury	7470A
Nickel	7521
Selenium	7742
Thallium	7841
Cyanide	9010B
Sulfide	9030B

Volatile Organic Compounds:

USEPA Method 8260B

Acetone
Acetonitrile (Methyl cyanide)
Acrolein
Acrylonitrile
Allyl chloride (3-Chloropropene)
Benzene
Bromochloromethane (Chlorobromomethane)
Bromodichloromethane (Dibromochloromethane)
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)

TABLE V

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- 1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC 12)
1,1 -Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1, l-Dichloroethene; Vinylidene chloride)
cis- l ,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans- l ,2-Dichloroethylene (trans- 1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane (Trimethylene dichloride)
2,2-Dichloropropane (Isopropylidene chloride)
1,1 -Dichloropropene
cis- 1,3-Dichloropropene
trans- l ,3-Dichloropropene
Di-isopropylether (DIPE)
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Isobutyl alcohol
Methacrylonitrile
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
Methyl methacrylate
4-Methyl-2-pentanone (Methyl isobutyl ketone)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Naphthalene
Propionitrile (Ethyl cyanide)
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane

TABLE V

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)
Toluene
1,2,4-Trichlorobenzene
1,1,1 -Trichloroethane, Methylchloroform
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene; TCE)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride (Chloroethene)
Xylene (total)

Semi-Volatile Organic Compounds:

USEPA Method 8270C - base, neutral, & acid extractables

Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
Aldrin
4-Aminobiphenyl
Anthracene
Benzo[a]anthracene (Benzanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
Bis(2-ethylhexyl) phthalate
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC (Lindane)
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methyethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)
4-Bromophenyl phenyl ether
Butyl benzyl phthalate (Benzyl butyl phthalate)
Chlordane
p-Chloroaniline
Chlorobenzilate
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene
2-Chlorophenol

TABLE V

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

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

TABLE V

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

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

TABLE V

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

Chlorophenoxy Herbicides:

USEPA Method 8l51A
2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Organophosphorus Compounds:

USEPA Method 8141A
Atrazine
Chlorpyrifos
0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)
Diazinon
Dimethoate
Disulfoton
Ethion
Methyl parathion (Parathion methyl)
Parathion
Phorate
Simazine

INFORMATION SHEET

ORDER NO. R5-2003-0146
COUNTY OF TULARE
FOR CONSTRUCTION, OPERATION, AND CLOSURE
VISALIA MUNICIPAL SOLID WASTE LANDFILL
TULARE COUNTY

The County of Tulare owns and operates a waste management facility known as the Visalia Municipal Solid Waste Landfill (facility). The facility is about seven miles northwest of Visalia.

The climate in the southern San Joaquin Valley is semi-arid, with hot, dry summers and cool winters. The average annual precipitation is 11.34 inches and the mean pan evaporation is estimated to be 70.7 inches per year. The facility is not within a 100-year floodplain, but is within a 500-year flood zone according to FEMA maps.

The facility is located upon the westward dipping, eastern limb of the asymmetrical geosynclinal trough of the San Joaquin Valley. The facility is located on unconsolidated alluvial fan deposits of the Kaweah River that consist of approximately 330 to 350 feet of interbedded clayey-silt, silt, and fine-to-medium-grain fluvial and flood basin sands. A 30-feet thick, low resistivity, hard clay and silt zone that may possibly represent the regionally extensive E-Clay, occurs between 180 and 210 feet below ground surface (bgs) beneath the western margin of the existing waste management unit (Unit) and areas west of the existing Unit. The low-resistivity layer is laterally continuous and serves as an aquitard that separates groundwater into an unconfined Upper Alluvial Aquifer (above 180 feet bgs) and a semi-confined Lower Alluvial Aquifer (below 210 feet bgs). Beneath the alluvial fan deposits are approximately 1,000 to 3,500 feet of consolidated and unconsolidated Tertiary marine deposits, continental deposits, and unconsolidated Quaternary alluvium that overlie a basement complex of pre-Tertiary age metasediments, plutonics, and ultramafics.

The facility is in a topographically flat region of the Tulare Lake Hydrologic Basin of the southern San Joaquin Valley. Surface drainage is toward Cross Creek in the Kaweah Delta Hydrologic Area of the Tulare Lake Hydrologic Basin.

The St. Johns River, the nearest surface water body to the facility, is approximately one mile north of the facility. Facility operations should not impact the St. Johns River.

The facility currently contains one existing unlined Unit (existing Unit) covering 127 acres. The existing Unit is currently classified as a Class III landfill that accepts municipal solid waste in accordance with Title 27, California Code of Regulations (CCR), Section 20005, et seq.

Tulare County proposes to construct a new Unit for the discharge of municipal solid waste to an area of 115 acres east of and adjacent to the existing Unit, but within the

same facility. The new Unit will consist of ten separate expansion cells beginning with the Phase I cell. Tulare County proposes to install an engineered alternative liner system in the new Unit that consists of, in ascending order: 1) a six-inch thick prepared subgrade; 2) a secondary double non-woven geosynthetic clay liner; 3) a secondary double-textured 60-mil thick high-density polyethylene geomembrane; 4) a tri-planar geocomposite secondary leachate collection and removal system; 5) a one-foot thick protective clean soil layer; 6) a primary double non-woven geosynthetic clay layer; and 7) a primary double-textured 60-mil high-density polyethylene geomembrane. A primary leachate collection and removal system is proposed to be placed atop the primary geomembrane consisting of a tri-planar geocomposite drainage layer on which will be placed a high-density polyethylene geopipe network nestled in a gravel layer exhibiting a permeability of 1cm/sec and wrapped by a non-woven geotextile filter fabric. A two-feet thick clean soil operations layer will be placed over the primary leachate collection and removal system on the base of the Unit.

Tulare County proposes to construct the sideslope liners with the same materials and in the same sequence as the bottom liner system.

Pan lysimeters will be installed for vadose zone monitoring and will consist of a geomembrane of sufficient thickness on a prepared subgrade below the leachate sump(s) and a portion of the leachate collection trench(es).

The revised waste discharge requirements will classify the new Unit as a Class III Landfill that accepts municipal solid waste in accordance with Title 27 CCR, Section 20005, et seq.

Tulare County demonstrated that the proposed double-composite liner system design exceeds the hydraulic conductivity liner requirement contained Title 27 CCR Section 20320(e) for a Class III landfill, and combined with a double leachate collection and removal system, provide for an overall containment system that meets the performance goal contained in Title 27 CCR Section 20310 for a Class III landfill.

Tulare County proposes a closure date of October 2006 for the existing Unit. Tulare County proposes to revise the Preliminary Closure and Postclosure Maintenance Plan for the existing Unit after the proposed new Unit is permitted for disposal operations and after its top deck has reached a minimum grade of five percent. Tulare County has not submitted a Final Closure and Postclosure Maintenance Plan for the existing Unit. Although the Final Closure and Postclosure Maintenance Plan for the existing Unit has not been submitted, Tulare County submitted a proposal for an engineered alternative final cover system design that consists of, in ascending order: 1) a two-feet thick soil foundation layer; 2) a GCL low-hydraulic conductivity layer; and 3) a two-feet thick vegetative layer.

There are 35 domestic wells and agricultural groundwater wells within one mile of the facility. No surface springs or other sources of groundwater supply have been observed. The first encountered groundwater ranges from about 50 feet below the native ground surface (bgs) at monitoring well M-6C to 56 feet below the native ground surface at monitoring well M-4B. Groundwater elevations range from 246 feet MSL at monitoring well M-6C to 233 feet MSL at monitoring well M-3B. The groundwater is unconfined. The depths to groundwater fluctuates seasonally as much as 15 feet. The most recent monitoring data indicates background groundwater quality has an electrical conductivity (EC) ranging between 640 and 940 micromhos/cm, with total dissolved solids (TDS) ranging between 410 and 640 mg/l. Monitoring data also indicates that background groundwater quality contains concentrations of nitrates ranging between 78 and 130 mg/l.

Groundwater occurs in several zones beneath the facility. The uppermost groundwater zone (S-zone), between the 40 feet and 60 feet bgs, is currently dry. The "A zone" exists between 80 feet and 100 feet bgs and the "B-zone" exists between 130 feet and 150 feet bgs. The "S zone", "A zone", and the "B zone" together make up the Upper Alluvial Aquifer and are separated from deeper groundwater zones by a 30-feet thick, low resistivity, hard clay and silt zone that occurs between 180 and 210 feet bgs. The "C zone" or Lower Alluvial Aquifer, exists between 220 feet and 240 feet bgs and the "Deep zone" exists at depths deeper than 340 feet bgs.

As a result of a 1985 groundwater investigation at the existing Unit, several volatile organic compounds (VOCs) were detected including: 1,1,1-trichloroethane; tetrachloroethylene (PCE); trichloroethylene (TCE); trans-1,2-dichloroethene; and 1,1-dichloroethane. The naturally-occurring inorganic compounds detected above background levels include specific conductance (EC); total dissolved solids (TDS); alkalinity; barium; arsenic; chloride; hardness; iron; manganese; and sodium. The 1987 Solid Waste Water Quality Assessment Test (SWAT) report utilized the same groundwater analytical data generated during the 1985 groundwater investigation.

Subsequent groundwater detection monitoring from 1992 through 2002 detected a number of VOCs including: PCE; TCE; trans-1,2-DCE; 1,1-DCA; cis-1,2-DCE; 1,1-DCE; 1,2-DCE; 1,2-dichloropropane; trichlorofluoromethane; dichlorodifluoromethane; chloroform; vinyl chloride; methyl chloride; bromoethane; chloroethane; 1,1,1-trichloroethane; p-dichlorobenzene; o-dichlorobenzene; chlorobenzene; and ethylbenzene.

Statistical analysis indicates that arsenic; barium; chloride, potassium; TDS; bicarbonate; chromium; cobalt; iron; sodium; sulfide; calcium; manganese; magnesium; total organic carbon; and EC have exceeded their respective background concentration limits on one or more occasions in one or more groundwater detection monitoring wells.

Cleanup and Abatement Order No. 99-718, issued by Executive Officer signature on 16 September 1999, directs the Discharger to complete an Evaluation Monitoring

Program and establish a Corrective Action Program in accordance with a time schedule. Tulare County submitted a report on 23 August 2002, that contained the results of the Evaluation Monitoring Program. The predominant VOCs detected in groundwater as a result of the Evaluation Monitoring Program include: PCE; TCE; 1,1,1-TCA; cis-1,2-DCE; trans-1,2-DCE; 1,1-DCE; 1,1-DCA; 1,2-DCA; vinyl chloride; and chloroethane. The predominant inorganic waste constituent (naturally-occurring) detected in groundwater as a result of the Evaluation Monitoring Program was TDS. The Regional Board deemed the Evaluation Monitoring Program for the facility complete in a 26 November 2002 letter to Tulare County. An Interim Corrective Action Program has been installed to remediate high concentrations of VOCs within the Upper Alluvial Aquifer along the western boundary of the existing Unit. A Final Corrective Action Program is currently being developed to remediate constituents of concern in areas of groundwater that are not remediated by the Interim Corrective Action Program.

Volatile organic compounds are often detected in a release from a landfill, and are the primary waste constituents detected in groundwater beneath a municipal solid waste landfill. Since volatile organic compounds are not naturally occurring, and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 CCR for the determination of a release of wastes from a Unit. Title 27 CCR does provide for the non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a Unit. However, Title 27 CCR does not specify a specific method for non-statistical evaluation of monitoring data. The Regional Board may specify a non-statistical data analysis method pursuant to Title 27 CCR Section 20080(a)(1). In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a Unit, this Order specifies a non-statistical method for the evaluation of monitoring data.

The specified non-statistical method for evaluation of monitoring data in this Order provides two criteria (or triggers) for making the determination that there has been a release of waste constituents from a Unit. The presence of two waste constituents above their respective method detection limit (MDL), or one waste constituent detected above its practical quantitation limit (PQL), indicates that a release of waste from a Unit has occurred. Following an indication of a release, verification testing will be conducted to determine whether there has been a release from the Unit, or there is a source of the detected constituents other than the Unit, or the detection was a false detection. Although the detection of one waste constituent above its MDL is sufficient to provide for the earliest possible detection of a release in accordance with Title 27 CCR, the detection of two waste constituents above the MDL as a trigger is appropriate due to the higher risk of false-positive analytical results and the corresponding increase in sampling and analytical expenses from the use of detecting one waste constituent above its MDL as a trigger.

On 9 October 1991, the United States Environmental Protection Agency (USEPA)

promulgated regulations (Title 40, Code of Federal Regulations, Parts 257 and 258, "federal municipal solid waste [MSW] regulations" or "Subtitle D") that apply, in California, to dischargers who own or operate Class II or Class III landfill units at which municipal solid waste is discharged. The majority of the federal MSW regulations became effective on the "Federal Deadline", which was on 9 October 1993. With the issuance of Resolution No. 93-62, the State Water Resources Control Board established a statewide policy for the regulation of discharges of municipal solid wastes consistent with Subtitle D. Following the issuance of Resolution No. 93-62, the USEPA deemed the State of California to be an approved state, meaning that compliance with the applicable state regulations constitutes compliance with the corresponding portions of the federal Subtitle D regulations. These requirements are consistent with Resolution No. 93-62 and Subtitle D, and implement the appropriate state regulations in lieu of Subtitle D. The Discharger also needs to comply with all applicable provisions of Subtitle D that are not implemented through compliance with this Order or Title 27 CCR.

The Tulare County Resource Management Agency certified the final environmental impact report for the new Unit on 26 September 2001. The Tulare County Resource Management Agency filed a Notice of Determination on 25 September 2001 in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) and CEQA guidelines (14 CCR Section 15000 et seq.). The Regional Board considered the environmental impact report and incorporated mitigation measures from the environmental impact report into these waste discharge requirements designed to prevent potentially significant impacts to design facilities and to water quality. Revision of the waste discharge requirements updates the requirements to conform with the California Water Code and Title 27 CCR Section 20005 et seq.

VSM:vsm/rac:9/5/2003