CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER No. R2-2007-0021

UPDATED WASTE DISCHARGE REQUIREMENTS AND RESCISSION OF ORDER NOS. 85-47, 93-055, 94-011, and 97-099 FOR:

WASTE MANAGEMENT OF CALIFORNIA, INC.

KIRBY CANYON RECYCLING AND DISPOSAL FACILITY
CLASS III SOLID WASTE DISPOSAL FACILITY
SAN JOSE, SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Water Board), finds that:

1. Waste Management of California, Inc. (WMC) (hereinafter called the Discharger) owns and operates the Kirby Canyon Recycling and Disposal Facility, a Class III municipal refuse disposal site located in the City of San Jose, Santa Clara County. Hereinafter, the Kirby Canyon Recycling and Disposal Facility is called the KCRDF or the landfill.

2. The KCRDF began operation in 1986 and provides disposal services for communities within the County of Santa Clara. As a canyon-fill operation, disposal "cells" within the landfill boundary are constructed sequentially as fill capacity is reached in previously constructed cells. To date, approximately 6 million cubic yards of waste have been deposited at the landfill.

PURPOSE OF ORDER

3. The purpose of this Order is to 1) update waste discharge requirements (WDRs) to reflect the construction of additional landfill cells, a new leachate impoundment, and changes to the groundwater and surface water monitoring programs since WDRs were last updated in 1993, 2) specify liner construction requirements for future landfill cell construction consistent with the requirements of Title 27, Division 2, Subdivision 1 of the California Code of Regulations (Title 27) and the provisions of Title 40 Part 258 of the Code of Federal Regulations (Subtitle D), and State Water Resources Control Board (State Board) Resolution No. 93-62, 3) specify monitoring, control, and collection requirements for groundwater, leachate, landfill gas, and storm water consistent with Title 27, and 4) rescind previous Water Board Order Nos. 85-47, 93-055, 94-011, and 97-099, which are described in Table 1 of this Order.

4. The liner design requirements specified in this Order are the same as specified in previous WDRs for the KCRDF adopted in 1993 (Order No. 93-055). All landfill cells constructed since 1993 have utilized a liner design consistent with these requirements.

5. This Order does not authorize the filling of wetlands or waters of the State at the KCRDF. Such activities require certification of water quality impacts by the Water Board or Executive

Officer pursuant to Section 401 of the Clean Water Act. Such activities may also require amendment or update of WDRs contained in this Order for the proposed fill area.

SITE DESCRIPTION AND LOCATION

6. The KCRDF is located in the southeastern portion of the Santa Clara Valley on the west side of the Diablo Range on land within the southern boundary of the City of San Jose (Figure 1). Access to the landfill is from the Coyote Creek Golf Drive interchange on U.S. Highway 101.

7. The landfill encompasses three major canyons and six drainage courses identified as Watercourses A through F (Figure 2). The natural site topography varies from moderate to steep elevations ranging from about 400 feet above Mean Sea Level (MSL) along the west side of the site to nearly 1300 feet above MSL along the east boundary.

8. The KCRDF is located on property owned by and leased from Castle & Cooke Development Corporation. The total 827-acre parcel is composed of a 760 acre lease boundary of which 311 acres are designated for refuse disposal and 449 are designated for ancillary landfill facilities and undeveloped areas; an additional 50 acres for landfill access roads and a potential soil borrow area; and an additional 17 acres for construction of drainage control facilities. The 311-acre permitted refuse disposal area is divided into five "fill areas" referred to as Fill Areas 1 through 5 (Figure 3). Fill areas are further subdivided into cells (Cells 1 through 13). As a canyon-fill operation, cells are constructed in phases until the final "build-out" of the entire landfill configuration is reached.

REGULATORY HISTORY

9. In July 1983, the Discharger submitted a Report of Waste Discharge (ROWD) and a document entitled ***"Design, Construction, and Operating Provisions – Kirby Canyon Sanitary Landfill"***, prepared by EMCON Associates. This report was later revised in July 1984, and amended on September 20, 1984, November 20, 1984, February 25, 1985, and April 1, 1985. This report proposes construction and operation details for the landfill in accordance with state regulations at the time.

10. On January 3, 1984, the City of San Jose, as lead agency, certified the Final Environmental Impact Report (EIR) for the landfill. The EIR identifies adverse water quality impacts for which mitigation measures would be necessary.

11. On August 30, 1984, the City of San Jose's Department of Neighborhood Preservation, acting as the local enforcement agency (LEA) to the California Integrated Waste Management Board issued a "Planned Development Conditional Use Permit", and an "Operating Permit for Facilities Receiving Solid Waste [Solid Waste Facilities Permit (SWFP) Number 43-AN-008] for the landfill. The SWFP was later modified and reissued on November 10, 1992 to reflect minor changes in operation, which had occurred since the 1984 SWFP was issued.

12. On May 15, 1985, the Water Board adopted WDRs (Order No. 85-47) thereby approving the July 1983 ROWD for the landfill, as amended. WDR Order No. 85-47 authorized operation of the KCRDF as a Class III solid waste management facility and permitted the 311-acre

footprint for refuse disposal including the five fill areas subdivided into multiple waste disposal cells.

13. In June 1992, the Discharger submitted a report entitled ***"Proposed Monitoring and Reporting Program for: Kirby Canyon Recycling and Disposal Facility"***, prepared by SEC Donohue pursuant to state regulations at that time. This report was revised in March 1993 to incorporate the cells planned for construction in the near future at the time (Cells 2, 3, 4, and 5) into the groundwater-monitoring network. In February 1993, the Discharger submitted a report entitled ***"Report of Design Cells 2 and 5"*** prepared by Bryan A. Stirrat & Associates, Inc. The report describes the design and construction of Cells 2 and 5 and the general inspection and operating procedures for the entire landfill. Based on these reports, the Water Board adopted WDR Order No. 93-055 on June 16, 1993, which updated liner requirements and the groundwater-monitoring program for Cells 2/5 consistent with state and federal regulations.

14. In September 1992, the Discharger submitted an application to the Water Board for water quality certification for the proposed filling of 3.62 acres of jurisdictional wetlands and waters of the United States consisting of seeps, springs, and seasonal watercourses within the entire landfill boundary. The proposed filling of these wetlands was associated with the design, construction, and fill plans for the entire landfill. The Discharger's application for water quality certification included the ***"Kirby Canyon Recycling and Disposal Facility, Wetlands/Waters Mitigation Plan"***, which proposed mitigation measures including creation of 6.2 acres of enhanced and in-kind compensating wetlands and 1.1 acres of other wetlands, and planting of 3.7 acres of riparian and upland shrubs, trees, and grasses surrounding the wetland areas.

15. In November 1992, the United States Army Corps of Engineers (COE) permitted the proposed filling of the 3.62 acres of wetlands under former Nationwide Permit 26 (COE File No. 19463S92) as proposed in the Discharger's September 1992 application.

16. On February 17, 1993, the Water Board adopted Resolution 93-017 recommending water quality certification for filling the 3.62 acres of wetlands as proposed in the Discharger's September 1992 application on the condition that the Discharger implement all mitigation measures identified in their September 1992 mitigation plan.

17. On March 9, 1993, the State Board provided water quality certification for the proposed filling of 3.62 acres within the entire landfill boundary under Clean Water Act Section 401 subject to the conditions contained in Water Board Resolution 93-017.

18. On January 19, 1994, the Water Board adopted WDR Order No. 94-011 amending Order No. 93-055. This amendment permits acceptance of designated wastes and wastes classified as non-hazardous pursuant to state and federal laws and regulations in cells constructed to Federal Municipal Solid Waste (MSW) and State Class II standards.

19. In 1996, the Discharger elected to postpone construction of new cells at the landfill and to reduce the mitigation measures previously approved by the COE, Water Board, and State Board. At that time, landfill operations had impacted 1.43 of the 3.62 acres of wetlands that were permitted for filling under Water Board Resolution 93-017. In response, the COE

revised its wetland impacts authorization under NWP 26 to cover only 1.76 of the total 3.62 acres of wetland fill.

20. On August 20, 1997, the Water Board adopted WDRs (Order No. 97-099) further amending Order No. 93-055. Order No. 97-099 approved the use of a specific engineered alternative design (EAD) in the liner for Cells 2/5, Phase IId. The approved EAD substituted a geosynthetic clay liner (GCL) for a compacted-clay liner (CCL) along side slopes.

21. In March 1999, the Discharger submitted a report titled ***"Design Report for Cells 3/4 Kirby Canyon Recycling and Disposal Facility"***, prepared by GeoSyntec Consultants. The report presented design plans for the entirety of Cells 3/4, which at the time were the next disposal cells planned for construction. The report proposed significant deviations for the Cells 3/4 liner design from what was approved in Order No. 93-055 for Cells 2/5. An addendum and responses to comments by Water Board staff were also submitted in June and July 1999 in support of the proposed design. On August 11, 1999, Water Board staff approved the Cells 3/4 liner design on the condition that it is consistent with the liner design for Cells 2/5, as approved in Order Nos. 93-055 and 97-099. In response, the Discharger submitted a report titled ***"Technical Specifications and Construction Quality Assurance (CQA) Plan"***, dated August 1999, prepared by GeoSyntec Consultants, which amended the Cells 3/4 liner design to be consistent with the liner design for Cells 2/5, as approved in Order No. 93-055. On September 15, 1999, Water Board staff approved the Cells 3/4 liner design as revised in the August 1999 Plan.

22. From September 1999 through March 2000, the Discharger constructed Phase 1A of Cells 3/4 in accordance with approved design plans. Construction Quality Assurance (CQA) for Phase 1A was documented in a report titled ***"Statement of Completion"***, dated April 27, 2000, prepared by Golder Associates. On May 5, 2000, Water Board staff approved the CQA report and placement of waste above the Phase 1A liner in Cells 3/4. Phase 1A was estimated to provide about one to two years of fill capacity.

23. As filling proceeded in Phase 1A of Cells 3/4, the Discharger began the construction permitting process for Phases 1B and 2A of Cells 3/4, which were expected to provide an additional two years of fill capacity. The Discharger submitted a report titled ***"Project Manual, Technical Specifications, and Construction Quality Assurance (CQA) Manual for Cell 3/4, Phase 1B and Phase 2A"***, prepared by GeoSyntec Consultants, dated January 17, 2001, which proposed a liner design for Phases 1B and 2A consistent with the overall design approved for Cells 3/4. On July 17, 2001, Water Board staff approved liner design for Phases 1B and 2A.

24. Construction of the liner for Phase 2A of Cells 3/4 occurred from May to August 2001. Phase 1B was not constructed due to regulatory issues concerning potential impacts to Watercourse B associated with Phase 1B. On August 8, 2001, the Discharger submitted a report titled ***"Summary CQA Certification"***, prepared by Golder Associates, which documented construction completion of the Phase 2A liner system according to approved design plans. On August 17, 2001, Water Board staff approved the CQA report and placement of waste above the Phase 2A liner in Cells 3/4.

25. In June 2003, the Discharger submitted a new application for water quality certification for fill activities in the upper reaches of Watercourse B related to construction of the later phases of Cells 3 and 4 (Fill Area 1) and Cell 6 (Fill Area 2). This application was later amended from August through October 2003. The impacts to Watercourse B would affect 5007 linear feet of streambed and include fill of 0.75 acres of waters of the U.S. and 1.2 acres of jurisdictional wetlands. The Discharger's proposed mitigation focused on preservation and enhancement of an existing watercourse (Watercourse A) and creation of a 1.2-acre mitigation wetland in the lower reach of Watercourse A.

26. On November 10, 2003, the Executive Officer granted water quality certification of the Discharger's June 2003 application, as amended, but found that the proposed mitigation for impacts to Watercourse B was sufficient for only 1275 of the 5007 linear feet of streambed impacts and the proposed mitigation for impacts to Watercourse A was sufficient for 821 linear feet of streambed impacts. The Executive Officer also found that certification of any additional impacts would be based on additional mitigation proposed by the Discharger.

27. In April 2004, the Discharger submitted a report titled ***"Permit Design Report for Cell 7"***, prepared by GeoSyntec Consultants. At the time Cell 7 was the next disposal cell planned for construction. The report presented liner design plans for Cell 7 consistent with previously approved designs for Cells 2/5 and 3/4. Cell 7 was proposed for construction in two phases (Phase 1 and Phase 2), each expected to provide about one to two years of fill capacity. In August 2004, Water Board staff approved the Cell 7 liner design as proposed in the April 2004 report.

28. In September 2004, the Discharger proposed an engineered alternative design (EAD) to the Cell 7 liner system. The EAD consisted of an encapsulated geosynthetic clay liner (GCL) along side slopes and a modified floor drain along the cell base. Otherwise, the Cell 7 liner design was consistent with previously approved designs for Cells 2/5 and 3/4. In April 2005, Water Board staff approved the incorporation of the EAD into the Cell 7 liner design.

29. Cell 7 liner construction occurred from April through July 2005. The Discharger submitted a report titled ***"Final Construction Quality Assurance (CQA) report for the Cell 7, Phase 1 Liner System"***, prepared by Golder Associates, dated July 11, 2005, which documented construction of the Cell 7, Phase 1 liner in accordance with approved design plans and construction drawings. On September 7, 2005, Water Board staff approved the CQA report and placement of waste above the Phase 1 liner in Cell 7.

30. In 2005, the Discharger constructed a second lined leachate storage impoundment (LSI) adjacent to the existing leachate impoundment (Figure 3). The new LSI was primarily constructed to provide temporary storage of untreated leachate until the leachate is evaporated or processed through the on-site leachate treatment system. The new LSI provides about 1.1 million gallons of additional leachate storage capacity and will help the Discharger manage leachate and storm water separately.

31. In October 2006, the Discharger proposed additional mitigation for impacts to Watercourse B associated with proposed fill activities in response to the Executive Officer's November 2003 conditional water quality certification (see finding 26). The mitigation proposed in October 2006 would occur within a headwater tributary to the Upper Penitencia Creek and includes

conversion of a failing stockpond along a headwater tributary to Upper Penitencia Creek into a stable habitat feature suitable for use by California Red-Legged Frog. This mitigation project is referred to as the Alum Rock Mitigation Pond. Under the October 2006 proposal, the total mitigation consists of 1) the previously proposed preservation and enhancement of Watercourse A, including the creation of a 1.2-acre mitigation wetland at the base of Watercourse A; and 2) the newly proposed Alum Rock Mitigation Pond project. However, at the time of this Order's adoption, the November 10, 2003, water quality certification has not yet been revised or reissued.

32. Table 1 summarizes the history and status of Water Board orders, resolutions, and certifications affecting the KCRDF.

Table 1 Water Board Orders, Resolutions, and Certifications for the KCRDF

Order No.	Date	Purpose	Status
85-47	5/15/85	WDRs for operation of the KCRDF as a Class III solid waste management facility	Updated and rescinded by this Order
93-017	2/17/93	Resolution recommending water quality certification for filling of 3.62 acres of jurisdictional wetlands and waters of the U.S. within the entire landfill boundary and associated with construction of the entire 311-acre landfill	Certified by State Board on 3/9/93
93-055	6/16/93	WDRs to update the groundwater monitoring program and liner requirements for compliance with state (Chapter 15) and federal (Subtitle D) regulations	Updated and rescinded by this Order
94-011	1/19/94	WDR amendment authorizing the acceptance of all waste that is non-hazardous in cells with liners constructed to Class II standards under state regulations	Updated and rescinded by this Order
97-099	8/20/97	WDR amendment approving the use of an engineered alternative design (EAD) for the liner in Cells 2/5	Updated and rescinded by this Order
	11/10/03	Conditional water quality certification for the proposed filling of the upper reaches of Watercourse B associated with build-out of Cells 3, 4, and 6	Remains in effect

SURFACE HYDROLOGY

33. The landfill is situated in the foothills of Coyote Ridge in the Coyote Creek watershed just north of Anderson Reservoir, a drinking water reservoir operated by the Santa Clara Valley Water District. The Coyote Creek watershed is an important recharge area for the Santa

Clara Valley Groundwater Basin, which is a major drinking water supply managed by the Santa Clara Valley Water District (SCVWD).

34. The natural site topography varies from moderate to steep elevations ranging from about 400 feet above Mean Sea Level (MSL) along the west side of the site to nearly 1300 feet above MSL along the east boundary.

35. The landfill encompasses three major canyons and six drainage courses identified as Watercourses A through F (Figure 2). All on-site drainages cut through serpentine-derived soils and serpentine bedrock, some exhibiting bedrock pools or step-pool morphology. Watercourses A, B, E, and F are perennial streams with water sources from springs. Watercourses C and D are ephemeral. Cells 1 and 2/5 are constructed within Watercourse B, separating the upper watershed from the lower watershed. Watercourse B now exists as discontinuous perennial and ephemeral stream segments. A mitigation wetland built in 1997 is located at the base of Watercourse B and derives water from nearby springs and seeps and also from periodic releases of impounded storm water from the landfill's storm water sedimentation pond (Figure 3).

36. Runoff from the landfill currently flows into a storm water sedimentation pond where it is reused, evaporated, or released downstream. When released from the sedimentation pond, storm water flows into a mitigation pond and wetland then to the Santa Clara Valley Water District's Coyote Canal. Both this Canal and nearby Coyote Creek, serve as recharge sources for the Santa Clara Valley Groundwater Basin.

37. The mean annual precipitation for the site is about 19.5 inches. The 100-year, 24-hour storm event is estimated to be 8.2 inches and the probable maximum precipitation, 15.7 inches. The mean annual evaporation is estimated to be 41.1 inches.

GEOLOGICAL SETTING

38. The landfill is located in a massive extrusion of serpentine rock which protrudes upward from deeper geologic strata and extends horizontally at least 1500 feet to the east and 600 feet to the west of the permitted disposal area footprint.

39. The serpentine formation is bounded on the northeast by the Silver Creek fault and on the southwest by the Coyote Creek fault. The closest Holocene fault is the Calaveras fault located 1.8 miles northeast of the site. The San Andreas fault, located approximately 11.4 miles southwest of the site, and the Calaveras fault, have had extensive historic earthquake activity.

40. The serpentinite body of the site and immediate vicinity is offset by a series of northwest striking, predominantly strike-slip faults. The Plio-Pleistocene Santa Clara Formation is found east and west of the KCRDF in fault contact with the serpentinite. The Santa Clara Valley is underlain by up to 1800 feet of the Plio-Pleistocene Santa Clara Formation sediments and Quaternary alluvium.

41. Ten primary faults within the San Andreas system (including the San Andreas fault zone) occur within about 36 miles of the KCRDF. These faults have been identified as potential

earthquake sources for the purposes of the Maximum Probable Earthquake (MPE) evaluation.

42. The geology beneath the landfill consists of serpentine bedrock generally overlain by a thin veneer of residual, alluvial, and colluvial soil referred to as the alluvial unit. The residual soil occurs mainly beneath the ridges and upper side slopes, while colluvium underlies the lower side slopes and fills swales and gullies. Alluvium is restricted to the valley bottoms. The surface soils are derived from the serpentinite and are relatively thin on the ridge tops and slopes (0.3-1.5 m; 1-5 feet) and thicker in gully bottoms (3-10+ feet).

43. Underlying the alluvial unit is weathered serpentine bedrock, which occurs to depths of approximately 20 to 30 feet in the valley areas and approximately 100 feet on or near ridge tops. This formation is composed of gray, weathered serpentinite with numerous iron-stained and clay-filled fractures. The weathered serpentinite interval is in turn underlain by unweathered serpentinite, which extends to depths in excess of 200 feet. This unweathered bedrock is composed of dark green to blue-gray, highly plastic to well indurated serpentinite.

44. Results of data from point load and unconfined compressive strength testing of rock core indicate a wide range of compressive strengths. The unweathered bedrock zone tends to exhibit local areas of rock competency whereas other zones have been characterized as weak and/or brecciated. This variability of lithology within the unweathered bedrock is explained by the fact that the serpentinite formation is a metamorphic alteration of an already-existing host rock. Results from several studies show that fracturing within the weathered and unweathered bedrock zones do not represent significant preferential groundwater migration pathways. Numerous hydraulic tests have not revealed joint fractured orientations resulting in increased groundwater flow, and inspection of drill-hole core samp1es indicates that fractures are in-filled by alteration and/or depositional clay-sized material. Recent geophysical studies indicate that fractures within the weathered serpentinite bedrock interval above the existing water table are also largely in-filled.

HYDROGEOLOGY

45. Groundwater occurs in all three lithologic units present at the site. However, limited quantities of shallow groundwater are found in the weathered and unweathered zones in the serpentine formation underlying the site. Water balance and flow calculations indicate that the alluvial zone provides approximately 95% of the groundwater flow through the first major canyon in which the Cells 2/5 and 3/4 are located. Approximately 4% of groundwater flow occurs within the weathered serpentinite unit and the remaining 1% occurs within the unweathered serpentine bedrock. The total dissolved solids (TDS) concentration of this shallow groundwater ranges from 510 to 550 mg/l. The pH of the groundwater increases with depth from approximately 7.9 to 9.6 units in the alluvial and weathered bedrock zones (magnesium bicarbonate type water) to approximately 10 to 12 units in the unweathered serpentine bedrock (calcium hydroxide type water).

46. Groundwater flow decreases dramatically from the alluvium to the unweathered serpentinite. Hydraulic conductivities have been estimated to be about $1x10^{-4}$ cm/sec in the alluvium, in the range of $1x10^{-5}$ cm/sec in the weathered serpentinite, and approximately $1x10^{-6}$ to $1x10^{-9}$ cm/sec in the unweathered serpentinite. Groundwater flows in a westerly and southwesterly

direction along the major canyons toward the Santa Clara Valley. At depth, the Coyote Creek Fault separates the serpentinite beneath the landfill from the Santa Clara Formation to the west and may act as a barrier to groundwater flow. The serpentinite bedrock and the Santa Clara Formation are characterized by very low hydraulic conductivities. The geologic materials of the Santa Clara Formation comprise a large portion of the Santa Clara Valley Groundwater Basin, which is a heavily used source of water.

47. Groundwater samples from the site indicate that younger and, therefore, less mineralized groundwater is present along ridge tops. Older, more mineralized groundwater is present in the lower canyon areas near the toe of the existing landfill (Cell 1). The groundwater geochemistry supports the scenario that the up-canyon bedrock areas represent zones of groundwater recharge, while the vertical upward gradients and more mineralized groundwater in the vicinity of the canyon bottom represent areas of groundwater discharge from the bedrock.

48. Groundwater beneath Cells 2/5 is approximately 70 to 100 feet below the surface at the ridge tops and 5 to 20 feet below the surface at the canyon floor. Several small, low-flow springs and seeps have been mapped along the canyon walls in Cells 2/5, 3/4, and 7.

49. Municipal and private wells serving the San Jose area are located in the Santa Clara Valley Alluvium; the closest wells are approximately 1 mile north of the site.

FILL PLANS

50. Refuse disposal began in Cell 1 of Fill Area 1 in 1986. By 1993, Cell 1 had reached its fill capacity with over one million cubic yards of refuse and construction had begun on Cells 2/5. Filling of Cells 2/5 occurred from 1993 through 2005. In 2000, as Cells 2/5 neared capacity, construction began on Cells 3/4. The first two phases constructed in Cells 3/4 (Phases 1a & 2a) have been filled to date. In 2004, construction began on Cell 7 in Fill Area 3. Construction of Cell 7, Phase 1 was completed in 2005 and began accepting waste in September 2005. Cell 7, Phase 2 is planned for construction in 2007 (Figure 3).

51. Future fill plans consist of completing Cell 7 prior to developing additional phases in Cells 3 and 4. Cell 6 in Fill Area 2 is planned for construction following development and filling of Cells 3/4. This development is anticipated to provide 10 to 15 years of operational capacity. Development beyond this point will proceed in Fill Areas 3, 4, and 5 in a sequential manner. Filling of wetlands or waters of the State at the KCRDF requires certification of water quality impacts by the Water Board or Executive Officer pursuant to Section 401 of the Clean Water Act and may require amendment or update of WDRs contained in this Order for the proposed fill area.

LANDFILL DESIGN, CONSTRUCTION, AND OPERATION

Cell 1:

52. Cell 1 was constructed in 1985 in accordance with Order No. 85-47. Cell 1 does not have a composite liner, rather a thin veneer of gunnite and/or bentonite clay was applied directly above the prepared subgrade. The containment system for Cell 1 consists of a hydraulic

barrier composed of a toe berm and grout curtain constructed at the toe of the cell and a dendritic-type leachate collection and spring water interceptor system.

53. The LCRS for cell 1 initially included a leachate extraction well (L-01) located just upgradient of the Cell 1 toe berm and grout curtain. In September 1997, two new leachate extraction wells (RE-01 and RE-02) were installed, and in October 1997, L-01 was abandoned. RE-01 and RE-02 are 60 feet deep and equipped with submersible pumps, which discharge automatically to a leachate collection pipe. The leachate interceptor system gravity drains to an on-site treatment system. Initially this system was separate from the subdrain, however at some point leachate or landfill gas impacts began to enter the subdrain, and as a result, the discharge pipes for the subdrain and LCRS were connected to ensure that all leachate is captured.

Cells 2/5:

54. Order No. 93-055 permitted expansion of the landfill to Cells 2/5 (Fill Area 1). Disposal operations commenced in Cells 2/5 in October 1993. Cells 2/5 cover approximately 36 acres of the first major canyon (Figure 3). The interim fill plan for these cells provided approximately 4.29 million cubic yards of airspace. To date approximately 4 million cubic yards of refuse have been placed in Cells 2/5. Cells 2 and 5 will receive additional refuse fill to final grades in the future as the adjoining fill areas are developed.

55. In accordance with Order No. 93-055, the Cells 2/5 liner was constructed with the following design components:

- Continuous or blanket spring water subdrain along the base and sideslopes,
- Composite liner consisting of an 80-mil HDPE geomembrane above two feet of compacted clay with a permeability of $< 10^{-7}$ cm/sec., and
- Gravel and slotted pipe LCRS along the base and swales.

Cells 3/4:

56. To date, two phases (1a and 1b) of Cells 3/4 have been constructed and filled with approximately 0.7 million cubic yards of refuse. The liner design for Cells 3/4 as approved by Water Board staff in September 1999 includes the following major components, from bottom to top. Figures 4a and 4b also illustrate the liner design for Cells 3/4.

Cells 3/4 Base	Cells 3/4 Side Slopes & Benches
• Prepared subgrade	• Prepared subgrade
• Geotextile separator	• Geotextile separator
• Gravel underdrain with 6-inch slotted pipe	• Blanket geonet underdrain
• Geotextile separator	• Geotextile separator
• 2-foot thick compacted clay liner	• 2-foot thick compacted clay liner or geosynthetic clay liner (GCL)*
• 80-mil single-sided textured HDPE geomembrane, textured side down	• 80-mil single-sided textured HDPE geomembrane, textured side down
• 1-foot Gravel LCRS with 6-inch slotted pipe	
• Geotextile separator	
• 1-foot min. soil operations layer	• 1-foot min. soil operations layer

* On sideslopes where refuse height is less than 150 ft, the proposed low-permeability component is a GCL rather than a CCL.

Cell 7:

57. Cell 7 is the most recent operational cell and is currently accepting waste. About 100,000 cubic yards of refuse have been placed in Cell 7, Phase 1 as of spring 2006. The liner design for Cell 7 as approved by Water Board staff in September 2005 includes the following major components, from bottom to top. Figures 5a and 5b also illustrate the liner design for Cell 7:

Cell 7 Base Liner	Cell 7 Side Slopes & Benches
• Prepared subgrade	• Prepared subgrade
• Geotextile Separator	• Geotextile separator
• Gravel underdrain with 6-inch slotted pipe	• Blanket geonet subdrain
• Geotextile separator	• Geotextile separator
• 2-foot thick compacted clay liner	• 40-mil double-sided textured HDPE geomembrane
• 80-mil single-sided textured HDPE geomembrane, textured side down	• Geosynthetic clay liner (GCL)*
• Gravel LCRS with 6-inch slotted pipe	• 80-mil single-sided textured HDPE geomembrane, textured side down
• Geotextile separator	
• 1-foot minimum soil operations layer	• 1-foot minimum soil operations layer

* The Cell 7 side slope design includes use of an encapsulated GCL, which consists of (1) a GCL product that is manufactured with an HDPE geomembrane on one side (i.e., geomembrane backing), or (2) a GCL without a geomembrane backing that is installed on top of a separate, double-sided, textured, 30 or 40 mil HDPE geomembrane. In either case the geomembrane is situated underneath the GCL (i.e., on the down-side). The HDPE geomembranes above and beneath the GCL are bonded at the edges to encapsulate the GCL, providing resistance to its complete hydration.

Leachate and Storm Water Management

58. Leachate from Cells 1, 2/5, 3/4, and 7 is conveyed via an LCRS transmission pipeline under gravity drainage to a treatment and storage impoundment facility located below the toe of the landfill (figure 6). Separate LCRS and subdrain transmission lines are maintained for each cell but flows are combined near the landfill toe berm so they can be combined and either routed directly through an activated carbon filter treatment system or temporarily discharged to a leachate storage impoundment (LSI). Leachate and spring water from Cell 1 are captured by two groundwater extraction wells (RE-01and RE-02) located on the upgradient side of the Cell 1 grout curtain. RE-01 and RE-02 are 60 feet deep and each is equipped with a submersible pump that discharges automatically to a leachate collection pipe.

59. The facility currently has two leachate storage impoundments (LSI-1 and LSI-2). The older of the two impoundments (LSI-1) was constructed in 1985 with two flexible membrane liners (FMLs) each consisting of 40-mil thick high density polyethylene (HDPE) but without a leak detection component between them. LSI-1 has a three million gallon capacity and provides temporary storage of treated and untreated leachate. The newer impoundment (LSI-2), was constructed in 2005 utilizing a double liner system with a leak detection component. LSI-2 provides about 1.1 million gallons of additional storage capacity for primarily untreated leachate. The liner design for LSI-2 includes the following components from bottom to top, as approved by Water Board staff in December 2005:

    - Soil bedding
    - Geosynthetic clay liner (GCL) with 40-mil HDPE geomembrane backing
    - Leak detection geonet
    - 60-mil HDPE geomembrane

60. A 12-inch diameter pipe connects the two LSIs to allow for emergency transfer of liquids, if necessary. All leachate is either evaporated directly from the impoundments, recirculated in composite-lined cells of the landfill, or re-used for dust suppression within the landfill. Historically, emergency overflows of treated leachate were discharged from LSI-1 to the adjacent storm water sedimentation pond via an overflow connector pipe. The additional leachate storage capacity provided by LSI-2 is intended to help the Discharger manage leachate and storm water separately and prevent the need for future leachate discharges to the storm water sedimentation pond.

61. Surface water run-on to the landfill and run-off from covered portions of the landfill is collected by perimeter and internal drainage ditches, which drain to the surface water sedimentation basin located at the site. Storm water collected in the sedimentation pond is either reused on or within the landfill, evaporated, or discharged downstream to maintain storage capacity for additional storm water runoff.

62. When released from the sedimentation pond, storm water flows into a mitigation pond and wetland then to the Santa Clara Valley Water District's Coyote Canal. Both this Canal and

nearby Coyote Creek, serve as recharge sources for the Santa Clara Valley Groundwater Basin.

WASTES AND THEIR CLASSIFICATION

63. The landfill was designed to receive nonhazardous solid waste as classified in CCR Title 27, Section 20220(a) from residential, commercial, and industrial sources. Nonhazardous solid waste includes but is not limited to putresible and nonputresible solid, semi-solid, and liquid wastes including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, and soil.

64. Although the KCRDF is classified as a Class III landfill, all currently existing cells except for Cell 1 have been designed and constructed in compliance with Federal Municipal Solid Waste (Subtitle D) requirements and State Class II siting criteria and design requirements in CCR Title 27, Section 20250. The Water Board has found that cells that meet such requirements generally provide a higher degree of water quality protection. The Water Board has also found (ref. WDR Order No. 94-011) that cells that meet Subtitle D and State Class II standards, pursuant to CCR Title 27, Section 20210, may accept designated waste for disposal. "Designated waste" is defined in CWC, Section 13173 as a) hazardous waste that has been granted a variance from hazardous waste management requirements pursuant to Section 25143 of the California Health and Safety Code (CHSC), or b) nonhazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of waters of the state." Therefore, this Order remains consistent with the Water Board's prior approval for the KCRDF (WDR Order No. 94-011), which permits the acceptance of designated waste in cells constructed to Federal Subtitle D and State Class II standards.

65. This Order also allows the landfill to receive nonhazardous solid waste and designated waste within cells that are constructed to Federal Municipal Solid Waste (Subtitle D) and State Class II standards, including the following, which may require special handling:

    a. Sewage and wastewater sludge
    b. Industrial sludge
    c. Ashes from household burning
    d. Petroleum-contaminated soil
    e. Lead-contaminated soil
    f. Triple rinsed pesticide containers in accordance with Title 22, CCR, Section 66261.7
    g. Inert materials, which can be used for the construction of a winter deck and maintenance of the internal roads of the landfill.
    h. Wastes and materials containing lead at concentrations less than the hazardous-waste threshold pursuant to Title 22, CCR
    i. Treated auto shredder waste
    j. Treated wood waste

66. "Treated wood" means wood that has been treated with a chemical preservative for the purposes of protecting wood against insects, microorganisms, fungi, and other environmental

conditions that can lead to decay of the wood and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. Sec. 136 and following). This may include but is not limited to waste wood that has been treated with chromated copper arsenate (CCA), pentachlorophenol, creosote, acid copper chromate (ACC), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), or chromated zinc chloride (CZC). The Federal Resource Conservation and Recovery Act of 1976, as amended (RCRA) exempts treated wood waste from regulation as a hazardous waste if the treated wood waste is disposed of in municipal landfill cells that are constructed to federal municipal solid waste (MSW) and State Class II standards. Section 25150.8 of the California Health and Safety Code provides that if treated wood waste is accepted by a solid waste landfill that manages and disposes of the treated wood waste in the manner specified, the treated wood waste shall be deemed to be a solid waste and not a hazardous waste.)

MONITORING, COLLECTION, AND CONTROL PROGRAMS

Groundwater:

67. In 1993, the initial groundwater monitoring network approved by Order No. 93-055 consisted of eight monitoring wells located adjacent to and due west of the Cell 1 toe berm. These wells were designed to monitor the three groundwater-bearing zones identified at the site: alluvium, weathered bedrock, and unweathered bedrock. Groundwater monitoring occurred semi-annually at wells G-1, G-2, G-3, MW-A1, MW-A2, MW-A3, MW-WB1, and MW-WB2.

68. In August 1994, the Discharger submitted a report titled ***"Addendum to the Proposed Monitoring and Reporting Program"***. This report proposed a revised monitoring well network, site-specific Constituents of Concern (COCs), and detection monitoring parameters. The proposed revised monitoring program allowed for the data to be statistically evaluated using control charts pursuant to landfill regulations at the time. In May 1996, Water Board staff approved the August 1994 addendum with the following conditions: 1) abandon wells G-1, G-2, and G-3, 2) install additional wells to monitor the alluvium, weathered bedrock, and unweathered bedrock, 3) continue monitoring wells MW-A1, A2, A3, WB1, and WB2 for chloride, and 4) amend the list of detection monitoring parameters, and site-specific COCs.

69. In September 1996, the Discharger submitted a workplan addressing the conditions in the Water Board's May 1996 approval letter. In April 1997, Water Board staff approved the September 1996 workplan with the following conditions: 1) submit a comprehensive site characterization report, 2) implement a geophysical survey to determine the alluvium thickness within the main canyon, and 3) submit a revised groundwater detection monitoring program to document results of the field work.

70. In January 1998, the Discharger submitted a report titled ***"Investigation Summary Report"***, prepared by RUST consultants documenting the fieldwork proposed in the Discharger's September 1996 workplan. This work included 1) installation of three new monitoring wells (MW-A4, MW-UB1, and MW-UB2), 2) abandonment of four existing monitoring wells (G-1, G-2, G-3, and TW-01), 3) abandonment of one leachate extraction well (L-01), and 4) installation of two new leachate extraction wells (RE-1 and RE-2).

71. The January 1998 ***"Investigation Summary Report"*** also proposed a Water Quality Protection Standard (WQPS) for the site in accordance with Title 27. In June 1998, the Discharger also submitted a report titled ***"Revised Site-Specific Monitoring and Reporting Program"***, which proposed changes to the groundwater detection monitoring and reporting program based on findings from earlier investigations and the proposed WQPS. In August 1998, Water Board staff approved both the WQPS for the site and the revised monitoring and reporting program. The revisions included: 1) removing wells MW-A2 and MW-WB1 from the groundwater monitoring network, 2) adjusting the detection monitoring parameters, and 3) providing for a semi-annual monitoring frequency only after a baseline of eight quarterly data points is established for each new site-specific parameter. Figure 6 shows the groundwater and leachate monitoring points established in 1998, which also represent the current monitoring locations.

72. Since 1998, groundwater monitoring for Cells 1, 2/5, and 3/4 has been in accordance with the approved WQPS and revised monitoring program. Quarterly monitoring occurred during all quarters of 1998 and 1999 until the necessary baseline of eight data points were collected to establish background water quality. Since 2000, groundwater monitoring has occurred semi-annually at eight locations, including four alluvium monitoring wells (MWs-A1, A2, A3, and A4), and four bedrock monitoring wells, two of which are screened in the weathered bedrock (MWs-WB1 and WB2), and two of which are screened in the unweathered bedrock (MWs-UB1 and UB2). Background water quality is continuously updated using results from monitoring wells MWs-A1, A3, WB2, UB1, and UB2 in accordance with the WQPS. Figures 7a and 7b show the current groundwater monitoring well locations for Cells 1, 2/5, and 3/4 as well as the groundwater elevation contours for the first quarter 2006.

73. In 2004, a separate groundwater monitoring network was established for Cell 7. The Cell 7 monitoring program consists of semi-annually groundwater monitoring at two locations including an unweathered bedrock monitoring well (MW-UB3) and a downgradient spring. Background water quality for Cell 7 was established at monitoring points MW-UB3 and a downgradient spring location using a minimum of thirteen consecutive monthly data points from September 2004 through September 2005.

74. To date, groundwater monitoring for Cells 1, 2/5, and 3/4 has detected trace levels of a few volatile organic compounds (VOCs) consistently in four monitoring wells. These trace-level constituents primarily include benzene, toluene, and acetone. Trace levels are less than the laboratory reporting limit and do not indicate a release. Review of the data indicates that low level detections of benzene may be associated with organic compounds indigenous to the alkaline serpentinite bedrock groundwater. The implications of this phenomenon are not fully understood and remain in the formative stages. Inorganic constituent results are within control limits established by the approved intra-well comparison method.

Leachate

75. Leachate from Cells 1, 2/5 and 3/4 is currently sampled at three locations: CELL-1, L-02, and L-03 (Figure 6). L-02 is a sample port located on the leachate transmission pipeline

immediately upgradient of the carbon treatment system. L-03 and CELL-1 are sample port locations within the Cell 1 leachate collection and recovery system (LCRS).

Storm Water and Surface Water

76. Chapter 40 of the Code of Federal Regulations (CFR), Parts 122, 123, and 124, require specific categories of industrial activities, including landfills, to obtain a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharges. The State Water Resources Control Board (State Board) has issued a General Permit for Storm Water Discharges Associated with Industrial Activities (NPDES Permit No. CAS000001). The landfill is subject to the requirements of the State Board's General Permit and as such is required to (1) submit a Notice of Intent for coverage under the General Permit, (2) prepare and implement a monitoring program, and (3) submit an annual report. To comply with the Storm Water General Permit, storm water is sampled twice yearly at three locations (SWM-2, SWM-3, SWM-5) shown on Figure 8. R01 is the discharge point from the Sedimentation Basin and is sampled during each discharge event. Storm water releases from the sedimentation pond to the downstream mitigation pond and wetland are sampled at location R01 shown on Figure 8. No other surface water monitoring is performed.

Landfill Gas

77. The Gas Collection and Control System (GCCS) is regulated by the Bay Area Air Management District (BAAQMD). The GCCS consists of collection wells located in the landfill that are connected to a header pipeline network to transmit landfill gas under vacuum pressure to the landfill gas flare system. The landfill gas flare burns the gas to mitigate potential pollutant emissions.

BASIN PLAN AND RESOLUTIONS

78. The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Water Board and approved by the State Water Resources Control Board, U.S. EPA, and the Office of Administrative Law where required. The latest version was effective as of December 22, 2006.

79. The Basin Plan provides that all groundwater is considered suitable, or potentially suitable, for municipal or domestic water supply (MUN) and that, in making any exceptions, the Water Board will consider the criteria referenced in Water Board Resolution No. 89-39, "Sources of Drinking Water", where:

    (a) The total dissolved solids exceed 3,000 mg/l (5,000 μS/cm, electrical conductivity), and it is not reasonably expected by the Water Board that the groundwater could supply a public water system, or

(b) There is contamination, either by natural processes or human activity (unrelated to the specific pollution incident), that cannot reasonably be treated for domestic use using best management practices or best economically achievable treatment practices, or

(c) The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

BENEFICIAL USES OF SURFACE WATER AND GROUNDWATER

Groundwater

80. The site resides within the boundaries of the Santa Clara Valley Groundwater Basin, as defined in the Basin Plan. The existing and potential beneficial uses identified for groundwater in this basin, according to the Basin Plan, include:

    a. Municipal and Domestic Supply (MUN)
    b. Industrial Process Supply (PROC)
    c. Industrial Service Supply (IND)
    d. Agricultural Supply (AGR)

81. Based on the hydrogeologic characterization and water quality data for the site, groundwater underlying the site qualifies as a potential source of drinking water in accordance with Water Board Resolution No. 89-39. Therefore, all of the above current and potential beneficial uses apply to groundwater beneath the site.

82. As groundwater at the site occurs within thin, low-yield alluvial sediments and weathered and fractured bedrock (serpentinite), the landfill is an unlikely site for future water supply wells.

Surface Water

83. Existing or potential beneficial uses identified for surface water in the southern Santa Clara Valley, Coyote Creek, and the Coyote Canal, according to the Basin Plan, include:

    a. Municipal and Domestic Supply (MUN)
    b. Industrial Process Supply (PROC)
    c. Industrial Service Supply (IND)
    d. Agricultural Supply (AGR)
    e. Water Contact Recreation (REC1)
    f. Non-Water Contact Recreation (REC2)
    g. Warm Fresh Water Habitat (WRM)
    h. Cold Fresh Water Habitat (COLD)
    i. Wildlife Habitat (WILD)
    j. Preservation of Rare and Endangered Species (RARE)
    k. Fish Migration (MIGR)
    l. Fish Spawning (SPWN)

CALIFORNIA ENVIRONMENTAL QUALITY ACT

84. The City of San Jose certified a final Environmental Impact Report dated September 15, 1983 for the 827-acre KCRDF in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et. seq.). It is intended that the findings, prohibitions, specifications, and provisions of this Order be consistent with the certified final Environmental Impact Report.

85. Adoption of this Order relates to construction and operation of waste management units within a permitted waste disposal area and is thus categorically exempt from the provision of the California Environmental Quality Act pursuant to Section 15301, Title 14 of the California Code of Regulations.

NOTIFICATION AND PUBLIC MEETING

86. The Water Board has notified the Discharger and interested agencies and persons of its intent to update waste discharge requirements and has provided them with an opportunity to submit their written views and recommendations.

87. The Water Board in a public meeting heard and considered all comments pertaining to the proposed waste discharge requirements for the site.

IT IS HEREBY ORDERED pursuant to the authority in Division 7, Section 13263 of the California Water Code (CWC), Title 27, Division 2, Subdivision 1 of the California Code of Regulations (Title 27), and State Board Resolution No. 93-62 that the Discharger, its agents, successors, and assigns shall meet the applicable provisions contained in Title 27, Division 7 CWC, and State Board Resolution No. 93-62, and shall comply with the following:

A. PROHIBITIONS

1. Waste shall not be exposed at the surface of any WMU.

2. Wastes shall not be disposed of in any position where they can be carried from the disposal site and discharged into waters of the State or of the United States.

3. The discharge of wastes, which have the potential to reduce or impair the integrity of the containment structures or which, if commingled with other wastes in the unit could produce chemical reactions that create heat, pressure, fire, explosion, toxic by-products, or reaction products, is prohibited.

4. The relocation of wastes is prohibited without prior Water Board staff concurrence.

5. The relocation of wastes to or from any waste management unit shall not create a condition of pollution or nuisance as defined in Section 13050 (l) and (m) of the California Water Code. Any relocated waste shall not be placed in or allowed to contact ponded water from

any source whatsoever. Wastes shall not be relocated to any location where they can be discharged into waters of the State or of the United States.

6. Excavation within or reconfiguration of any existing waste management unit is prohibited without prior concurrence of Water Board staff. Minor excavation or reconfiguration activities such as for installation of signs or landscaping, or for routine maintenance and repair, do not require prior staff concurrence.

7. Wastes shall not be placed in any area of a new unit without Executive Officer approval based on receipt of an adequate construction quality assurance report(s) certified by a California registered civil engineer or California - certified engineering geologist.

8. Construction of the containment features of all future waste management units must be in compliance with this Order, Title 27, and State Board Resolution No. 93-62.

9. The discharge or storage of hazardous waste, as defined in Sections 2521 and 2522 of Title 23, Article 2 of Chapter 15 and as defined in CCR Title 22, at the landfill is prohibited.

10. The groundwater shall not be degraded as a result of the waste disposal operation.

11. Filling of wetlands or waters of the State at the KCRDF without certification of water quality impacts associated with the proposed filling by the Water Board or Executive Officer pursuant to Section 401 of the Clean Water Act is prohibited.

12. Surface drainage from tributary areas and internal site drainage from surface or subsurface sources shall not contact or percolate through wastes during the life of the site.

13. Buildup or mounding of leachate levels within the landfill is prohibited and shall be prevented by operation of a leachate extraction system. The depth of leachate shall not be greater than 12-inches above the bottom liner.

14. Leachate, or storm water or groundwater containing leachate, or in contact with waste, shall not be discharged to waters of the State or of the United States unless specifically authorized under an NPDES permit.

15. The treatment, storage, or discharge of groundwater or leachate shall not create a condition of pollution or nuisance as defined in Section 13050(m) CWC, nor degrade the quality of waters of the State or of the United States.

16. The Discharger shall not cause the following conditions to exist in waters of the State or of the United States at any place outside the landfill boundary:

    a. Surface Waters:

        (1) Floating, suspended, or deposited macroscopic particulate matter or foam
        (2) Bottom deposits or aquatic growth
        (3) Adverse changes in temperature, turbidity, or apparent color beyond natural background levels

(4) Visible, floating, suspended, or deposited oil or other products of petroleum origin
(5) Toxic or other deleterious substances to be present in concentrations or quantities which may cause deleterious effects on aquatic biota, wildlife or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentrations.

b. Groundwater:

(1) Degradation of groundwater quality; or
(2) Substantial worsening of existing groundwater impacts

17. Migration of pollutants through subsurface transport to waters of the State is prohibited.

B. SPECIFICATIONS

1. The Discharger shall conduct monitoring activities according to the Self Monitoring Program (SMP) attached to this Order, and as may be amended by the Executive Officer, to verify the effectiveness of landfill closure systems including groundwater, surface water, leachate, and landfill gas containment, collection, treatment, and removal.

2. At any time, the Discharger may file a written request (including supporting documentation) with the Executive Officer, proposing modifications to the attached SMP. If the proposed modifications are acceptable, the Executive Officer may issue a letter of approval that incorporates the proposed revisions into the SMP.

3. The Discharger shall install any reasonable additional monitoring devices for groundwater, surface water, leachate, and landfill gas required to fulfill the terms of any future SMP issued by the Executive Officer for the landfill.

4. The Discharger shall maintain, inspect, repair, and replace all devices installed in accordance with this Order such that they continue to operate as intended without interruption.

5. Precipitation and drainage control facilities shall be designed with a minimum capacity to accommodate a 100-year, 24-hour storm event.

6. The site shall be protected from any washout or erosion of wastes from inundation, which could occur as a result of a 100-year, 24-hour storm event, or as the result of flooding with a return frequency of 100 years.

7. The landfill foundation and structures or devices for erosion control and water, leachate, and gas containment and monitoring shall be constructed and maintained to withstand conditions generated during the maximum probable earthquake.

8. Containment, collection, drainage, and monitoring systems for groundwater, surface water, and leachate, shall be maintained and operated as long as waste or leachate is present and poses a threat to water quality.

9. The leachate discharge system shall be maintained and operated to minimize undue buildup of hydraulic head on the bottom of the landfill and ensure that accumulated fluid is being adequately removed from the landfill and appropriately contained and discharged.

10. Methane and other landfill gases shall be adequately vented, removed from the landfill, or otherwise controlled to minimize the danger of explosion, adverse health effects, nuisance conditions and the impairment of beneficial uses of water due to gas migration.

11. Discharge of leachate and gas condensate is 1) limited to areas of the landfill that are equipped with a composite liner and a leachate collection system and 2) limited to the unit of the landfill from which derived except as otherwise approved by the Executive Officer. Leachate collected from Cell 1 shall be discharged only to a portion of the landfill that meets condition 1) above and Specification B.12 or to the landfill's leachate treatment and storage facility.

12. Recirculation of leachate or gas condensate to a different cell or unit from where it was generated shall be allowed with an acceptable operations, monitoring, and maintenance plan approved by the Executive Officer. At a minimum, 1) the receiving cell or unit must have a composite liner and LCRS designed to federal (Subtitle D) municipal solid waste (MSW) and state Class II standards, 2) the leachate generation and buildup above the liner must be monitored separately for each receiving cell or unit and is limited to 12 inches or less, and 3) recirculation may not occur under pressures exceeding gravity drainage.

13. Final and interim covers for the landfill shall be graded and maintained to promote lateral runoff of precipitation and prevent ponding or infiltration of water on or within the landfill.

14. The Discharger shall implement a Detection Monitoring Program (DMP), pursuant to Title 27, Section 20420. The DMP shall be designed to identify any water quality impacts from the landfill and demonstrate compliance with the Water Quality Protection Standard (WQPS), which is required pursuant to Title 27, Section 20390. The SMP attached to this Order is intended to constitute the DMP for the landfill.

15. The WQPS for the KCRDF, which is documented in the Discharger's 1998 report titled ***"Revised Site-Specific Monitoring and Reporting Program"***, shall include the following:

    a. Constituents of Concern: Section 20395 of Title 27 defines Constituents of Concern (COCs) as "all waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit". COCs for the KCRDF include monitoring parameters identified in the SMP attached to this Order, or any future amendment thereof, and all Appendix II parameters in the federal Subtitle D regulations.

    b. Monitoring Parameters: Monitoring parameters (MPs), a subset of the COCs, are typically the most mobile and commonly detected COCs in groundwater at the site and are measured on a more frequent basis than the entire list of COCs. The MPs for the KCRDF shall include, at a minimum, all constituents identified as such in the SMP attached to this Order, or any future amendments thereof. The Discharger may propose modification to the MPs as additional data become available concerning site-specific

source characteristics and natural background water quality. However, modifications shall only be made upon written concurrence from the Executive Officer.

c. Concentration Limits: Concentration limits (CLs) for all COCs detected at the specified points of compliance shall be established using the background data set pursuant to Title 27, Section 20400. An upper prediction limit (UPL) shall be calculated from the background data set using statistical methods as appropriate.

d. Point of Compliance: Title 27 defines the Point of Compliance (POC) as the "vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit." The POC for the KCRDF shall be the hydraulically downgradient perimeter of the waste fill area.

e. Monitoring Points: Title 27 defines Monitoring Points as "a well, device, or location specified in the waste discharge requirements at which monitoring is conducted and at which the water quality protection standard applies". Monitoring points for the KCRDF, which are located along the POC and at additional locations, are specified in the SMP attached to this Order, or any future amendments thereof.

16. Whenever there is "measurably significant" evidence (as defined in Title 27, Section 20164) or significant physical evidence of a release, the Discharger shall be prepared to implement an Evaluation Monitoring Program (EMP) pursuant to Title 27, Section 20425, at the direction of the Water Board. In such a case, the Discharger shall continue implementing the DMP as prescribed in any SMP attached to this Order. If required, the EMP shall be implemented to determine the nature and extent of any release detected by the DMP.

17. Future landfill cells liners shall be constructed consistent with the design and components specified below, from bottom to top, which are consistent with Cells 3/4 and 7. Alternative liner designs and/or components must be approved by the Executive Officer. Liner designs consistent with the following specifications will likely streamline the Water Board staff review and approval process.

Cell Base	**Cell Side Slopes & Benches**
Prepared subgrade	Prepared subgrade
Geotextile separator	Geotextile separator
Gravel underdrain with 6-inch slotted pipe	Blanket geonet underdrain
Geotextile separator	Geotextile separator
2-foot thick compacted clay liner	2-foot thick compacted clay liner or geosynthetic clay liner (GCL)*
80-mil single-sided textured HDPE geomembrane, textured side down	80-mil single-sided textured HDPE geomembrane, textured side down
1-foot Gravel LCRS with 6-inch slotted pipe	
Geotextile separator	
1-foot min. soil operations layer	1-foot min. soil operations layer

* On sideslopes where refuse height is less than 150 ft, the proposed low-permeability component may be a geomembrane-encapsulated GCL rather than a CCL.

18. Nonhazardous solid waste and designated waste shall only be discharged into composite-lined waste management units equipped with leachate collection and removal systems meeting Federal Municipal Solid Waste construction and design requirements specified in the Subtitle D regulations and meeting State Class II siting, construction, and design requirements specified in CCR Title 27, Section 20250 and specifications B.5 through B.17 of this Order.

19. Treated wood waste shall only be discharged into composite-lined waste management units equipped with leachate collection and removal systems meeting Federal Municipal Solid Waste construction and design requirements specified in the Subtitle D regulations and meeting State Class II siting, construction, and design requirements specified in CCR Title 27, Section 20250 and specifications B.5 through B.19 of this Order. Treated wood waste shall be managed and disposed of in accordance with California Health and Safety Code Sections 25143.1.5 and 25150.7. If a verified release is detected from the waste management unit where treated wood waste is disposed, the disposal of treated wood waste shall be terminated at the unit with the verified release until corrective action ceases the release. This discharge specification applies only to treated wood waste that is a hazardous waste solely due to the presence of a preservative in the wood, and is not subject to hazardous waste management regulation under the federal act.

20. The Discharger shall provide and maintain a minimum of two surveyed permanent monuments near the landfill from which the location and elevation of wastes, containment structures, and monitoring facilities can be determined throughout the operation and post-closure maintenance periods. These monuments shall be installed by a licensed land surveyor or registered civil engineer.

21. The Discharger shall notify the Water Board immediately of any failure occurring in the landfill. Any failure that threatens the integrity of containment or control features or structures at the landfill shall be promptly corrected after approval of the method and schedule by the Executive Officer.

22. When there are multiple landowners or lease holders involved, the Discharger shall provide reasonable access to any property they own or lease at the site to allow for installation, sampling, monitoring, etc., of all devices and equipment necessary for compliance with the requirements of this Order.

23. All reports submitted pursuant to this Order shall be prepared under the supervision of and signed by appropriately licensed professionals, such as a California registered civil engineer, professional geologist, and/or certified engineering geologist.

C. PROVISIONS

1. Self-Monitoring Program: The Discharger shall comply with the Self-Monitoring Program (SMP) attached to this Order (Part A and Part B) and as may be amended by the Executive Officer. The attached SMP is intended to constitute a Detection Monitoring Program (DMP) pursuant to Title 27, Section 20420 and is designed to identify significant water quality impacts from the landfill and demonstrate compliance with the Water Quality Protection Standard (WQPS) established pursuant to Title 27, Section 20390. The attached SMP may be amended as necessary at the discretion of the Executive Officer.

   COMPLIANCE DATE: Immediate

2. Evaluation of Storm Water and Leachate Production and Storage Capacity: The Discharger shall submit a technical report, acceptable to the Executive Officer, evaluating the landfill's storage capacity needs for storm water and leachate in order to consistently manage storm water and leachate separately and without the need for periodic discharges of leachate (treated or untreated) to the storm water basin. The technical report shall also propose any necessary measures to meet the required storage capacity, such as construction of additional impoundments, reduction of leachate generation, etc. The evaluation should consider the past hydrograph for leachate and storm water production and should consider future production to at least a 100-year, 24-hour precipitation event.

   COMPLIANCE DATE: September 15, 2007

3. Leak Detection Monitoring for Leachate Storage Impoundments: The Discharger shall submit a technical report, acceptable to the Executive Officer, proposing a leak detection program for the leachate storage impoundments (LSIs). The program shall include a Water Quality Protection Standard (WQPS) for protection of groundwater and surface water due to potential impacts from the leakage of treated or untreated leachate from the LSIs.

   COMPLIANCE DATE: September 15, 2007

4. Leachate Monitoring by Cell; Annual LCRS Testing: The Discharger shall submit a technical report, acceptable to the Executive Officer, evaluating the feasibility of monitoring leachate generation and quality for each cell before it is combined for all cells at the Cell 1 toe berm. The technical report shall include a figure illustrating the details of the leachate collection and transmission system for all cells to the leachate treatment system and impoundments. The figure shall indicate the locations where leachate is currently monitored and where it could be monitored separately for each cell. The technical report shall also propose a program for annual testing of the each LCRS for each cell, pursuant to Section 20340(d) of Title 27.

   COMPLIANCE DATE: September 15, 2007

5. Report of Waste Discharge: The Discharger shall submit a technical report, acceptable to the Executive Officer, describing any proposed material change in the character, location, or volume of a discharge, or in the event of a proposed change in use or development of the landfill [CWC Section 13260(c)]. The technical report shall describe the project, identify

key changes to the design that may impact any portion of the landfill, and specify components of the design necessary to maintain integrity of the landfill cover and prevent water quality impacts. No material changes to any portion of the landfill shall be made without approval by the Executive Officer.

COMPLIANCE DATE: 120 days prior to any material change

6. Financial Assurance for Post Closure Monitoring and Maintenance: The Discharger shall submit to this Board evidence of an Irrevocable Fund acceptable to the Executive Officer, to ensure monitoring and maintenance of the landfill during the post-closure period. Every five years, for the duration of the post-closure monitoring period, the Discharger shall submit a report that includes an outline of the financial assurance mechanism and verification that the fund has been created. Fund value should be supported by calculations, to be included with this submittal, providing cost estimates for all post-closure monitoring, maintenance, repair and replacement of landfill containment, cover, and monitoring systems. The fund value should be based on the sum of these estimates. The cost estimates and funding should be updated to reflect change to monitoring systems as they occur. The post-closure maintenance period shall extend as long as the landfill wastes pose a threat to water quality, however for purposes of calculating cost estimates, a period of no less than 30 years may be used.

   COMPLIANCE DATE: July 1, 2007, then every five years thereafter

7. Financial Assurance for Corrective Action: The Discharger shall submit to this Board evidence of an Irrevocable Fund acceptable to the Executive Officer, to ensure any corrective action and remediation actions that may be necessary as a result of current or future unforeseen releases from the landfill. Every five years, for the duration of the post-closure monitoring period, the Discharger shall submit a report that includes an outline of the financial assurance mechanism and verification that the fund has been created. Fund value should be supported by calculations, to be included with this submittal, providing cost estimates for all corrective action measures and remediation that may be required at the landfill. The fund value should be based on the sum of these estimates. The cost estimates and funding should be updated as necessary. The post-closure maintenance period shall extend as long as the landfill wastes pose a threat to water quality, however for purposes of calculating cost estimates, a period of no less than 30 years may be used.

   COMPLIANCE DATE: July 1, 2007, then every five years thereafter

8. Construction-Related Storm Water Control Plans: For each grading or development project outside of the permitted landfill footprint proposed greater than one acre in size, the Discharger shall submit a Notice of Intent to the State Board, submit a Storm Water Pollution Prevention Plan acceptable to the Executive Officer, and implement Best Management Practices (BMPs) for the control of stormwater, in accordance with requirements specified in the State Board's General Permit for Storm Water Discharges Associated with Construction Activities (NPDES Permit No. CAS000002). The Discharger will be deemed in compliance with this provision if another party constructing improvements on property owned by the Discharger, pursuant to an easement granted by the Discharger, has obtained coverage under the General Permit.

COMPLIANCE DATE: 30 days prior to construction

9. Well Installation Report: The discharger shall submit a technical report, acceptable to the Executive Officer, that provides well construction details, geologic boring logs, and well development logs for all new wells installed as part of the Discharge Monitoring Program (Attachment A).

COMPLIANCE DATE: 60 days following completion of well installation

10. Earthquake Inspection: The Discharger shall submit a detailed Post Earthquake Inspection Report acceptable to the Executive Officer, in the event of any earthquake generating ground shaking of Richter Magnitude 7 or greater at or within 30 miles of the landfill. The report shall describe the containment features, groundwater monitoring, and control facilities potentially impacted by the static and seismic deformations of any waste management unit. Damage to any waste containment facility, which may impact State waters, must be reported immediately to the Executive Officer.

COMPLIANCE DATE: Within 2 weeks of Earthquake

11. Availability: A copy of these waste discharge requirements shall be maintained by the Discharger and shall be made available by the Discharger to all employees or contractors performing work (maintenance, monitoring, repair, construction, etc.) at the landfill.

12. Change In Ownership: The Discharger must notify the Executive Officer in writing at least 30 days in advance of any proposed transfer of this Order's responsibility and coverage to a new Discharger. The notice must include a written agreement between the existing Discharger and the new Discharger containing a specific date for the transfer of this Order's responsibility and coverage between the current Discharger and the new Discharger. This agreement shall include an acknowledgment of which Discharger is liable for violations up to the transfer date and which Discharger is liable from the transfer date on. [CWC Sections 13267 and 13263]

13. Revision: These waste discharge requirements are subject to review and revision by the Water Board. [CCR Section 13263]

14. Termination: Where a Discharger becomes aware that it failed to submit any relevant facts in a Report of Waste Discharge or submitted incorrect information in a Report of Waste Discharge or in any report to the Water Board, it shall promptly submit such facts or information. [CWC Sections 13260 and 13267]

15. Vested Rights: This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, do not protect the Discharger from liability under Federal, State or local laws, nor do they create a vested right for the Discharger to continue the waste discharge. [CWC Section 13263(g)]

16. Severability: Provisions of these waste discharge requirements are severable. If any provisions of these requirements are found invalid, the remainder of these requirements shall not be affected. [CWC 9213]

17. Operation and Maintenance: The Discharger shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with conditions of this Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this order. [CWC Section 13263(f)]

18. Reporting of Hazardous Substance Release: If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, the Discharger shall report such discharge to the Water Board by calling (510) 622-2300 during regular office hours (Monday through Friday, 8:00 to 5:00). A written report shall be filed with the Water Board within five working days. The report shall describe: the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

19. Entry and Inspection: The Discharger shall allow the Water Board, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:

    a. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this order;
    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this order;
    c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
    d. Sample or monitor at reasonable times, for the purposes of assuring compliance with this order or as otherwise authorized by the California Water Code, any substances or parameters at any location. [CWC Section 13267]

20. Discharges To Navigable Waters: Any person discharging or proposing to discharge to navigable waters from a point source (except for discharge of dredged or fill material subject to Section 404 of the Clean Water Act and discharge subject to a general NPDES permit) must file an NPDES permit application with the Water Board. [CCR Title 2 Section 223571]

21. Endangerment of Health or the Environment: The Discharger shall report any noncompliance that may endanger health or the environment. Any such information shall be provided orally to the Executive Officer, or an authorized representative, within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission to the Water Board shall also be provided within five days of the time a Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and

its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected; the anticipated time it is expected to continue and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Executive Officer, or an authorized representative, may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

22. Document Distribution: Copies of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be provided to the following agencies:

    a. San Francisco Bay Water Board
    b. City of San Jose, Local Enforcement Agency representative

    The Executive Officer may modify this distribution list as needed.

23. Duty to Comply: The Discharger shall comply immediately, or as prescribed by the time schedule below, with all Prohibitions, Specifications and Provisions of this Order. All required submittals must be acceptable to the Executive Officer. The Discharger must also comply with all conditions of these waste discharge requirements. Violations may result in enforcement actions, including Water Board orders or court orders requiring corrective action or imposing civil monetary liability, or in modification or revocation of these waste discharge requirements by the Water Board. (CWC Section 13261, 13263, 13265, 13268, 13300, 13301, 13304, 13340, 13350).

24. Requests for Technical Reports: All technical and monitoring reports required by this Order are requested pursuant to Section 13267 of the California Water Code. Failure to submit reports in accordance with schedules established by this Order or failure to submit a report of sufficient technical quality acceptable to the Executive Officer may subject the Discharger to enforcement action pursuant to Section 13268 of the California Water Code.

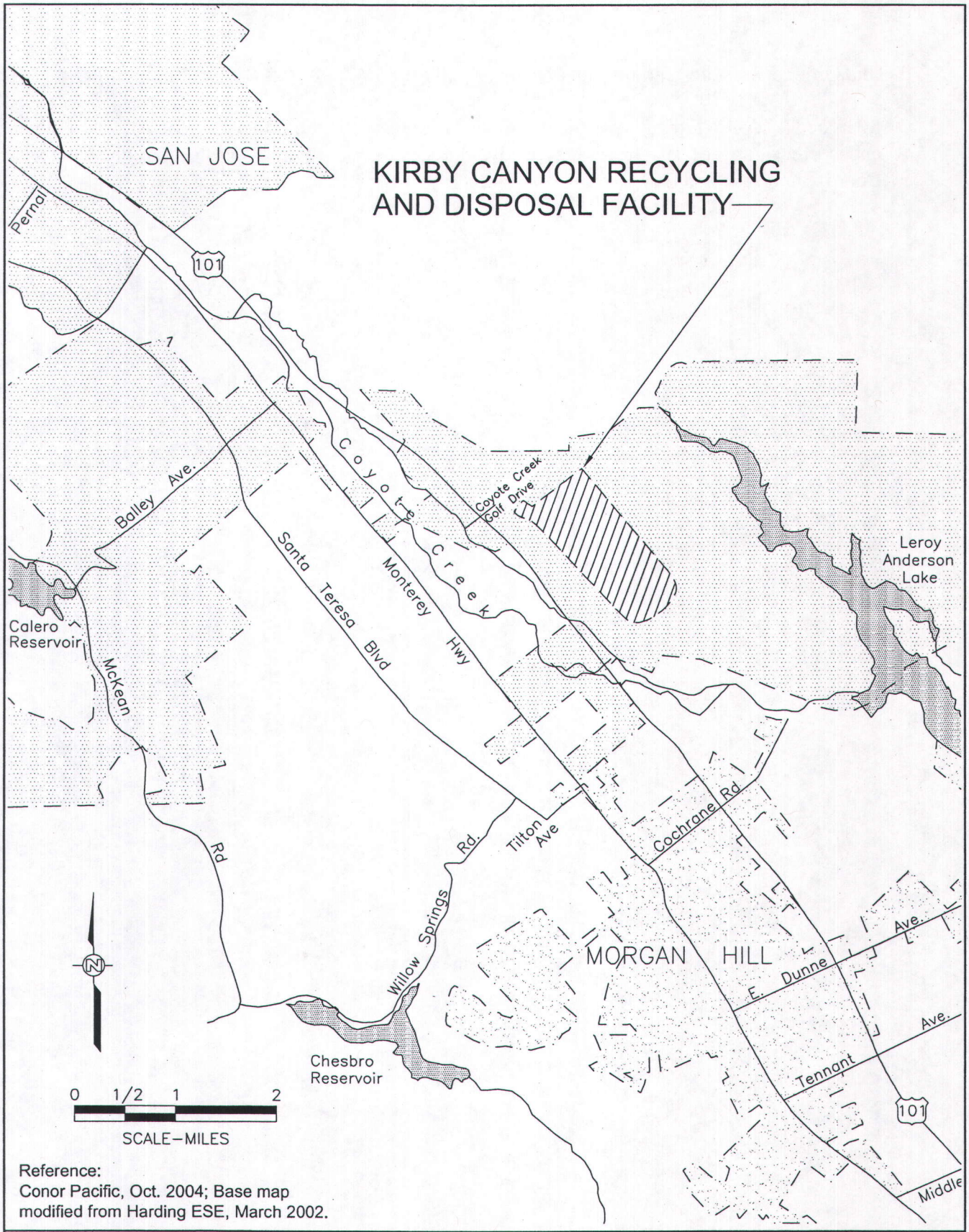
25. Electronic Reporting Format: In addition to print submittals, all reports submitted pursuant to this Order must be submitted as electronic files in PDF format. The Water Board has implemented a document imaging system, which is ultimately intended to reduce the need for printed report storage space and streamline the public file review process. Documents in the imaging system may be viewed, and print copies made, by the public, during file reviews conducted at the Water Board's office. PDF files can be created by converting the original electronic file format (e.g., Microsoft Word) and/or by scanning printed text, figures & tables. Upon request by Water Board staff, monitoring results, including water level measurements, sample analytical results, coordinates, elevations, etc., shall be provided electronically in **Microsoft Excel® or similar spreadsheet format**. This format facilitates data computations and/or plotting that Water Board staff may undertake during their review. Data tables submitted in electronic spreadsheet format will not be included in the case file for public. All electronic files, whether in PDF or spreadsheet format, shall be submitted via the Water Board's file transfer protocol (FTP) site, email (only if the file size is less than 3 MB) or on CD. CD submittals may be included with the print report. Email notification should be provided to Water Board staff whenever a file is uploaded to the Water Board's FTP site.

26. This Order supersedes and rescinds Order Nos. Nos. 85-47, 93-055, 94-011, and 97-099.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on March 14, 2007.

Bruce H. Wolfe
Executive Officer

Attachments:
Figure 1 - Vicinity Map
Figure 2 – Water Courses and Site Drainage
Figure 3 – Site Layout
Figures 4a, 4b – Liner details for Cells 3/4
Figures 5a, 5b – Liner details for Cell 7
Figure 6 – Groundwater and Leachate Monitoring Locations
Figures 7a, 7b – GW Levels for Alluvium and Bedrock
Figure 8 – Storm Water and Surface Water Monitoring Locations
Self Monitoring Program (Part A and Part B)

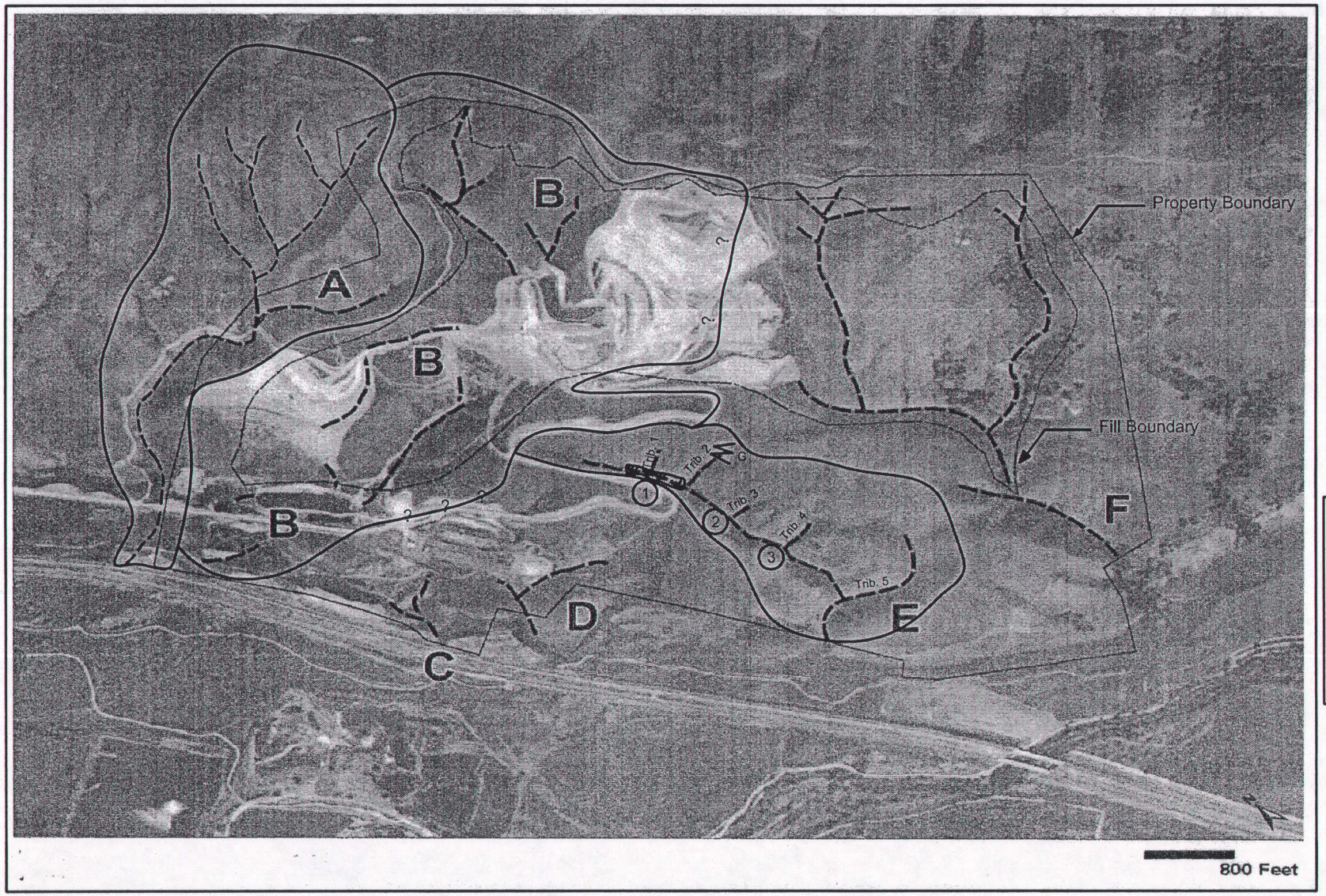


Reference:
Conor Pacific, Oct. 2004; Base map modified from Harding ESE, March 2002.

CRAWFORD CONSULTING INC.

FIGURE 1
SITE LOCATION
WASTE MANAGEMENT
KIRBY CANYON RECYCLING & DISPOSAL FACILITY
SANTA CLARA COUNTY,CALIFORNIA

DATE: 04/19/05
FILENAME: SITE0405.DWG
PROJ. No. WM8701

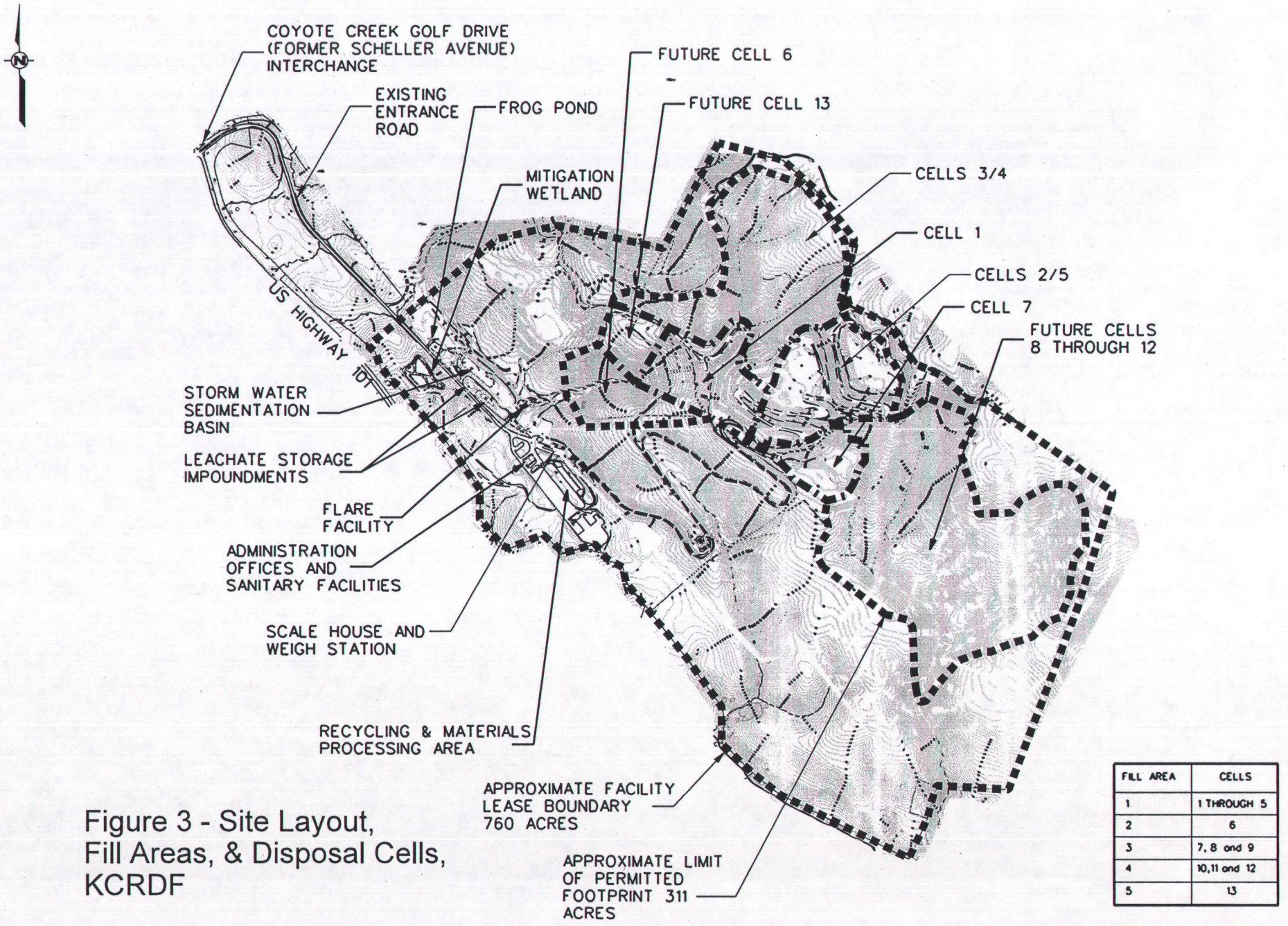


KEY:	
A	Watercourse
	Watershed Boundary
	Approximate Watershed Boundary
HC	Major Headcut
G	Severe Gully Development

Related Features

1. Seeped Earthflow Deposits w/ MHT
2. Unstable Step-Pools (L=200')
3. Stable Bedrock Dominated Step-Pools

Figure 2 - Water Courses and Site Drainage, KCRDF

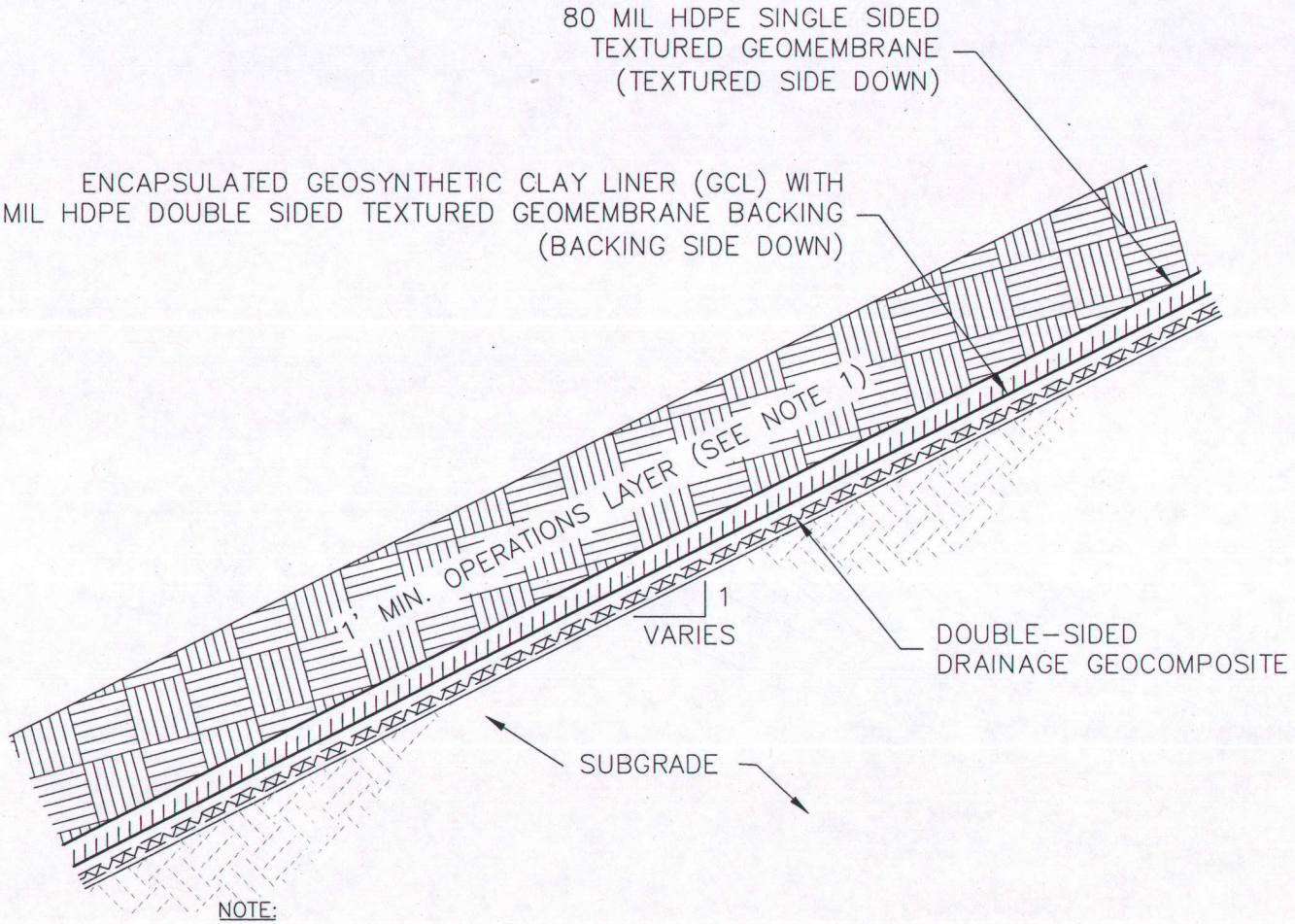


FILL AREA	CELLS
1	1 THROUGH 5
2	6
3	7, 8 and 9
4	10, 11 and 12
5	13

NOT TO SCALE

Figure 3 - Site Layout, Fill Areas, & Disposal Cells, KCRDF

Figure 4a - Liner Details for Cells 3/4, KCRDF



NOTE:

1. CONTRACTOR SHALL PLACE 2-FT THICK OPERATIONS LAYER ON BENCHES AND 1-FT THICK OPERATIONS LAYER 10 FEET ALONG THE SLOPE LENGTH IMMEDIATELY ABOVE A BENCH OR TOE OF SLOPE. OWNER SHALL BE RESPONSIBLE FOR PLACING REMAINING OPERATIONS LAYER DURING WASTE FILLING.

NOT TO SCALE

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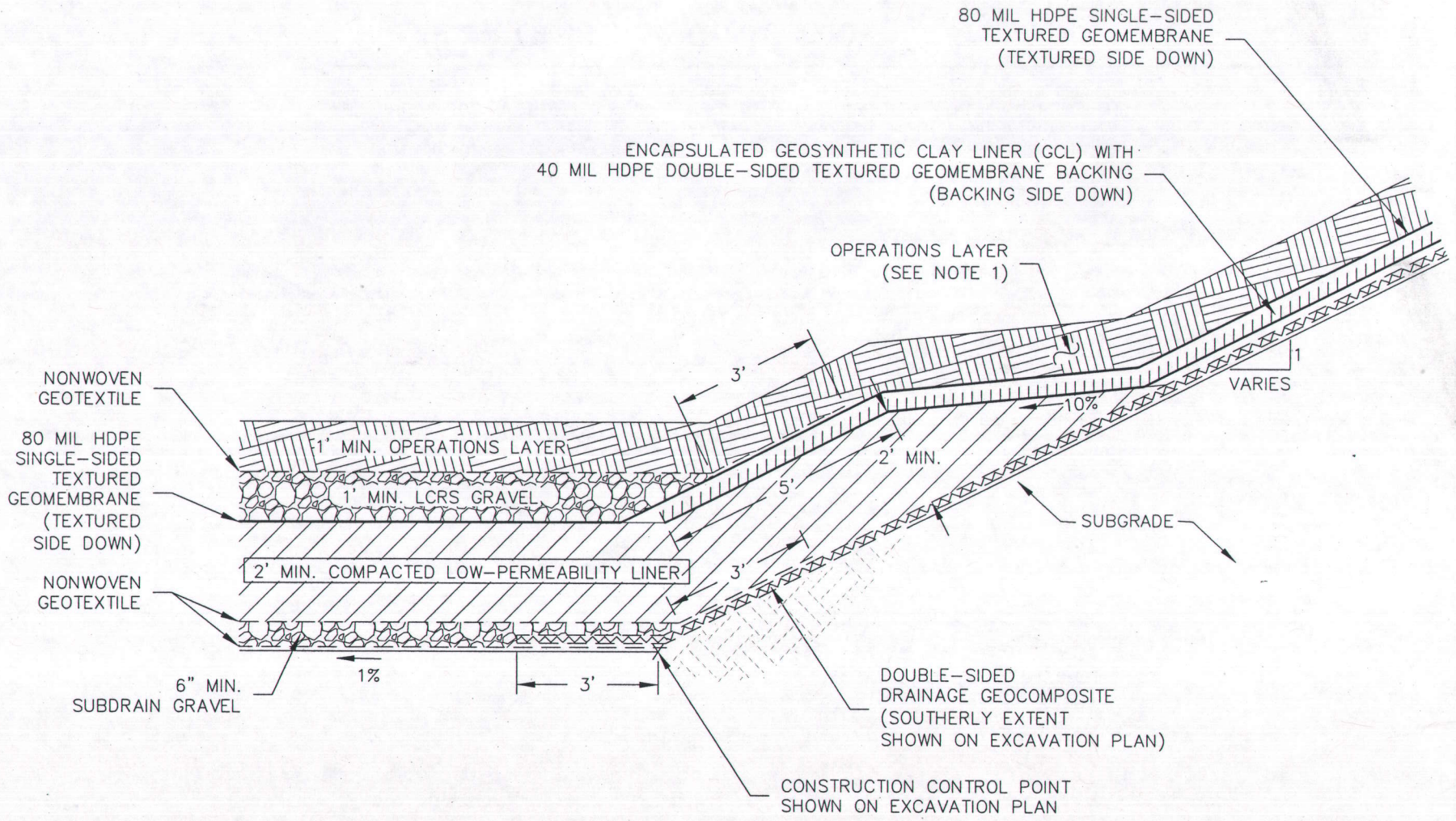
GeoSyntec Consultants

SIDE SLOPE LINER SYSTEM CELL 7, KIRBY CANYON RDF SAN JOSE, CALIFORNIA	FIGURE NO. 1 PROJECT NO. WL0679 DATE: 3 DECEMBER 2004

Figure 4b - Liner Details for Cells 3/4, KCRDF



NOTE:

1. CONTRACTOR SHALL PLACE 2-FT THICK OPERATIONS LAYER ON BENCHES AND 1-FT THICK OPERATIONS LAYER 10 FEET ALONG THE SLOPE LENGTH IMMEDIATELY ABOVE A BENCH OR TOE OF SLOPE. OWNER SHALL BE RESPONSIBLE FOR PLACING REMAINING OPERATIONS LAYER DURING WASTE FILLING.

NOT TO SCALE

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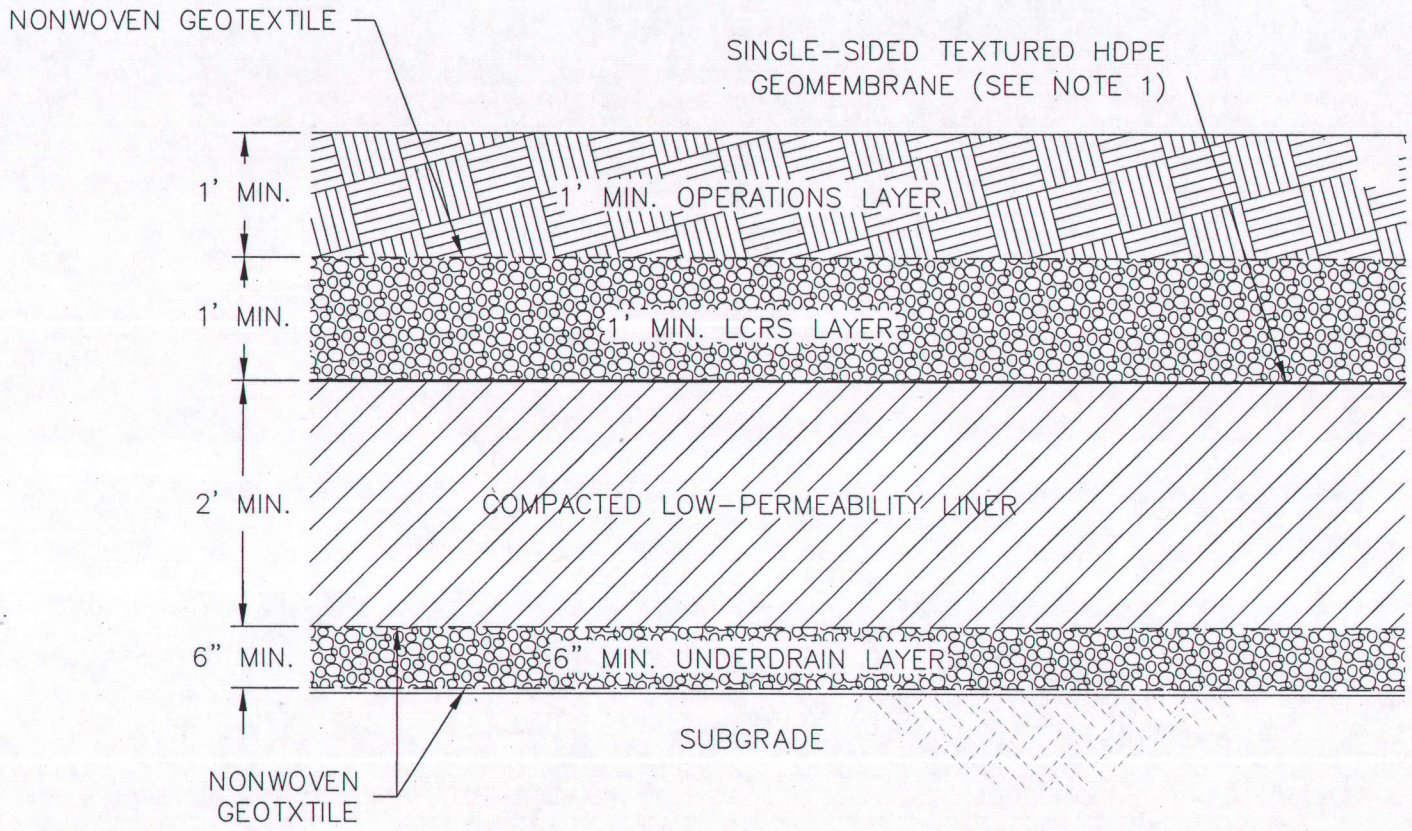
GeoSyntec Consultants

TRANSITION AT TOE OF SLOPE WITH GCL ENCAPSULATION
CELL 7 DEVELOPMENT, KIRBY CANYON RDF
SAN JOSE, CALIFORNIA

FIGURE NO.	2
PROJECT NO.	WL0679
DATE:	3 DECEMBER 2004

Figure 5a - Liner Details for Cell 7, KCRDF



NOTE:

1. TEXTURED SIDE OF GEOMEMBRANE AGAINST COMPACTED LOW-PERMEABILITY LINER.

NOT TO SCALE

GeoSyntec Consultants

FLOOR LINER SYSTEM KIRBY CANYON RDF SAN JOSE, CALIFORNIA	FIGURE NO. 1 PROJECT NO. WL0679 DATE: MARCH 2004

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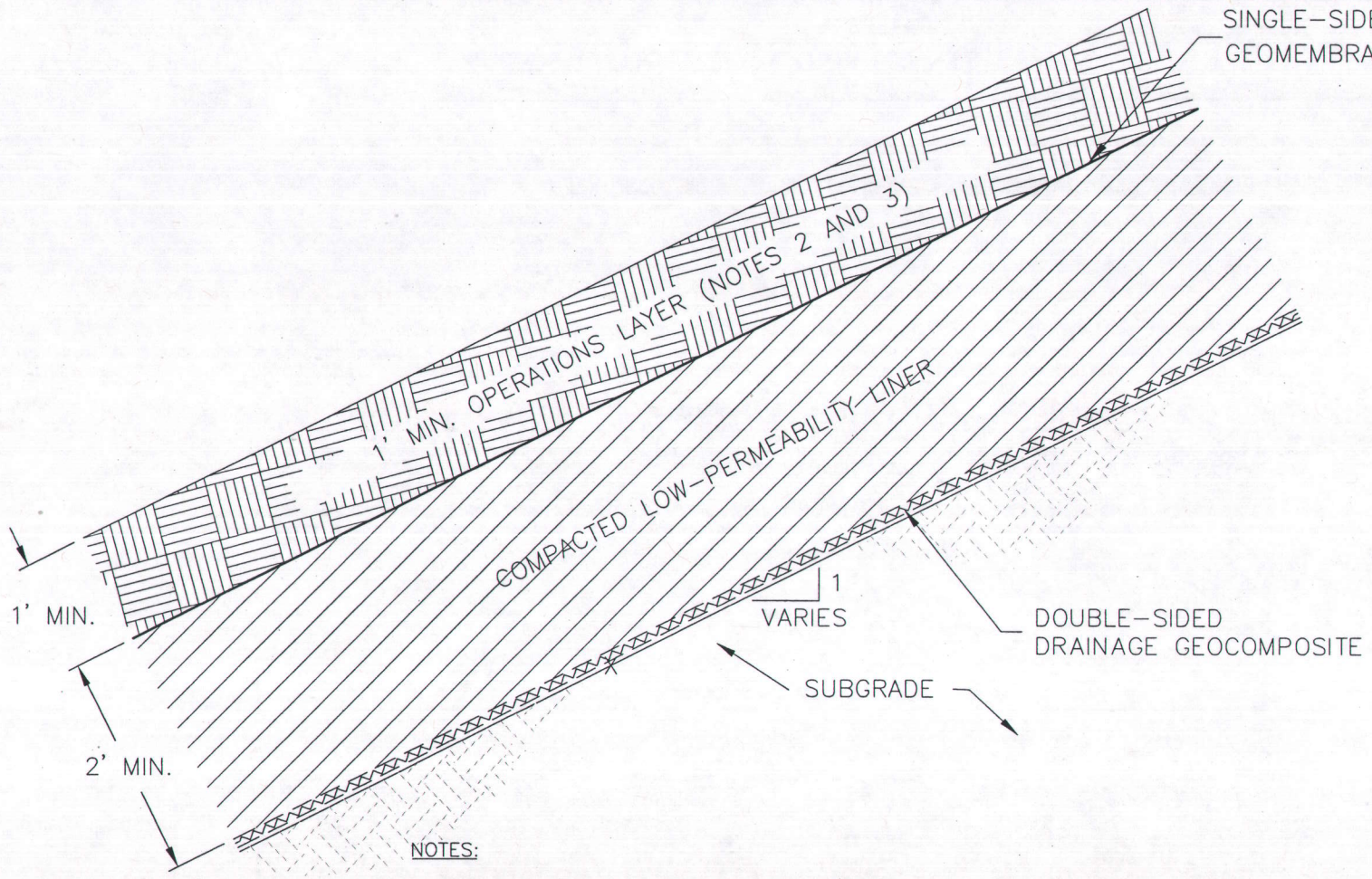
Figure 5b - Liner Details for Cell 7, KCRDF



NOTES:

1. TEXTURED SIDE OF GEOMEMBRANE AGAINST COMPACTED LOW-PERMEABILITY LINER.

2. CONTRACTOR SHALL PLACE 2-FT THICK OPERATIONS LAYER ON BENCHES AND 1-FT THICK OPERATIONS LAYER 10 FEET ALONG THE SLOPE LENGTH IMMEDIATELY ABOVE A BENCH OR TOE OF SLOPE. OWNER SHALL BE RESPONSIBLE FOR PLACING REMAINING OPERATIONS LAYER DURING WASTE FILLING.

3. SACRIFICIAL GEOMEMBRANE SHALL BE PLACED BY GEOSYNTHETICS CONTRACTOR TO PROTECT GEOMEMBRANE AREAS NOT COVERED WITH OPERATIONS LAYER.

NOT TO SCALE

GEOSYNTEC CONSULTANTS

SIDE SLOPE LINER SYSTEM WITH COMPACTED LOW-PERMEABILITY LINER KIRBY CANYON RDF, SAN JOSE, CALIFORNIA	FIGURE NO. 2 PROJECT NO. WL0679 DATE: MAY 2004

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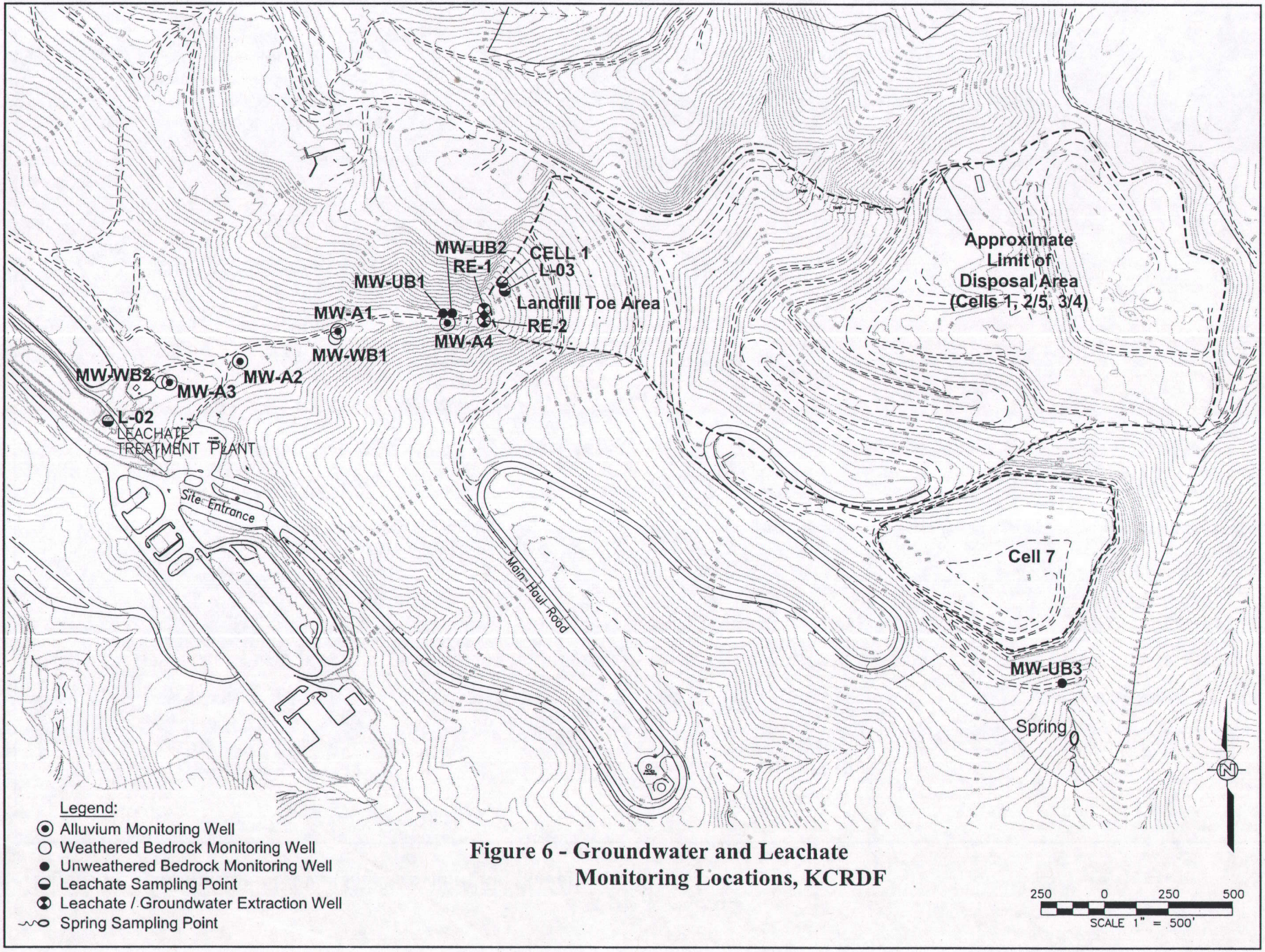


Figure 6 - Groundwater and Leachate Monitoring Locations, KCRDF

Figure 7a - Groundwater Elevations (Alluvium) First Quarter 2006, KCRDF

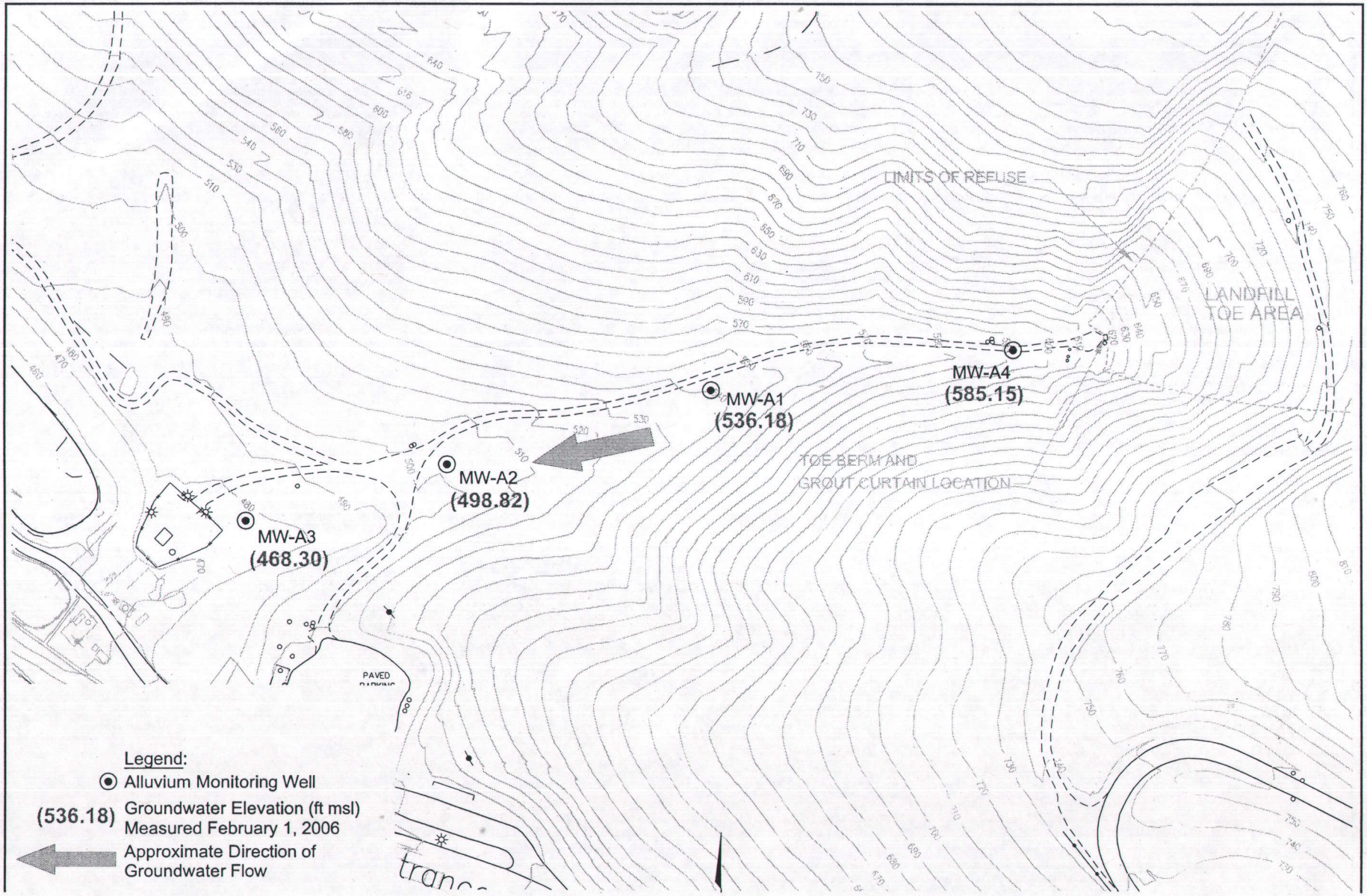
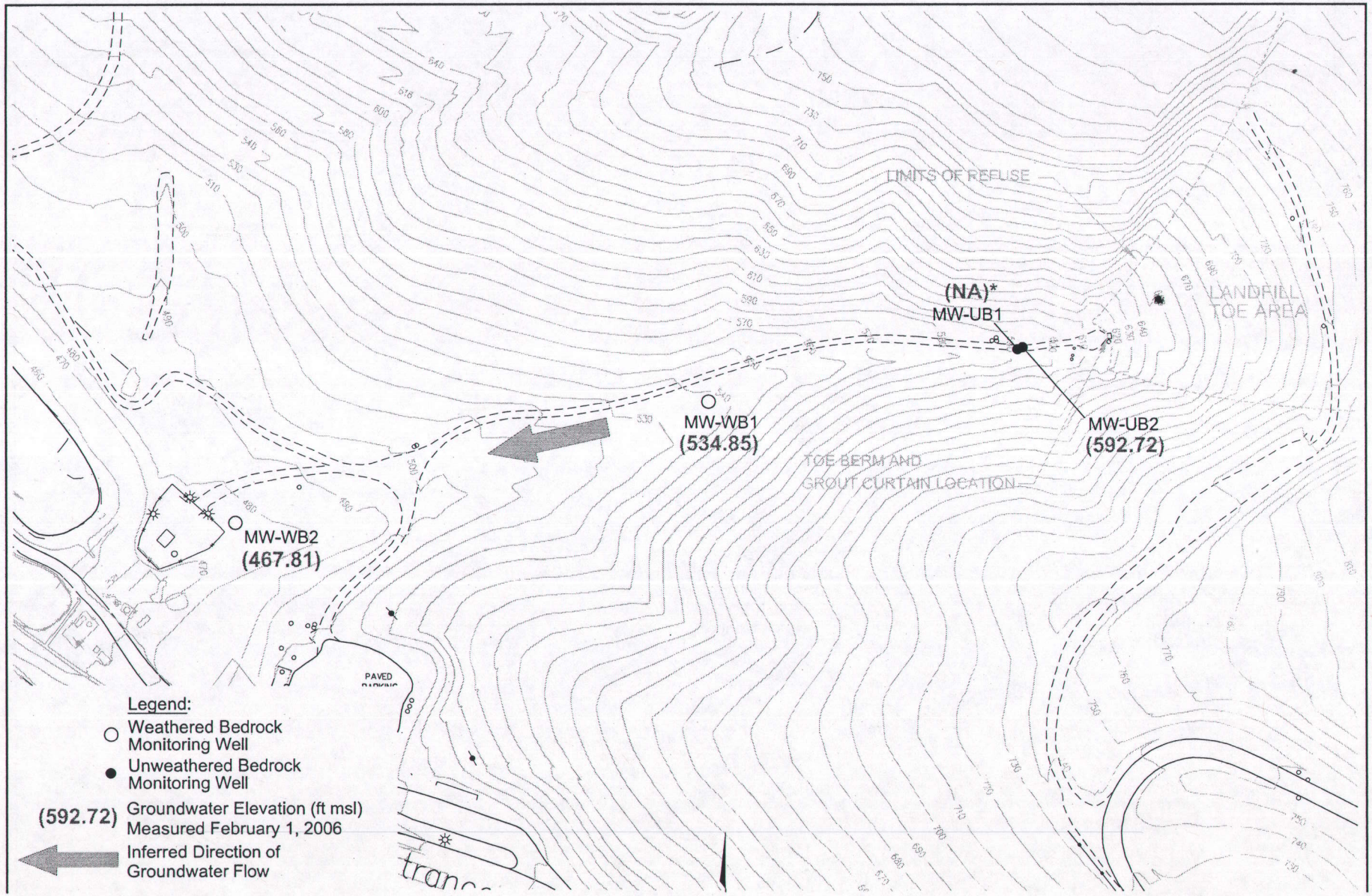


Figure 7b - Groundwater Elevations (Bedrock) First Quarter 2006, KCRDF



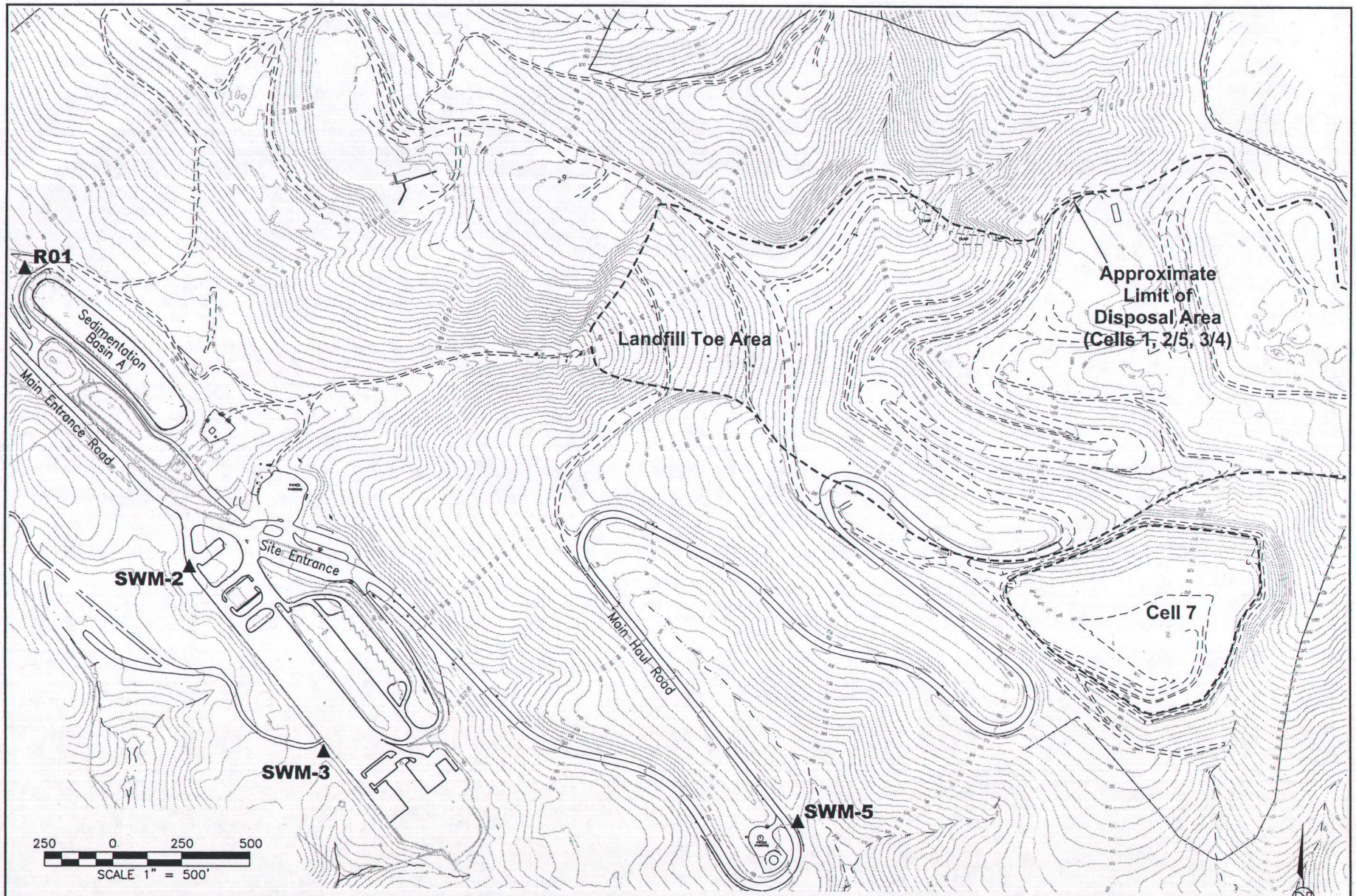


Figure 8 - Storm Water Monitoring Locations, KCRDF

Legend:

▲ Storm Water Sampling Location

SWM-2

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

WASTE MANAGEMENT OF CALIFORNIA, INC.

KIRBY CANYON RECYCLING AND DISPOSAL FACILITY
CLASS III SOLID WASTE DISPOSAL FACILITY
SAN JOSE, SANTA CLARA COUNTY

ORDER No. R2-2007-0021

CONSISTS OF

PART A

AND

PART B

PART A

This self monitoring program (SMP) specifies monitoring and reporting requirements, including:

- General monitoring requirements for landfills and waste management units (Part A)
- Self monitoring report content and format (Part A)
- Self monitoring report submittal frequency and schedule (Part B)
- Monitoring locations and frequency (Part B)
- Monitoring parameters and analytes (Part B)

A. AUTHORITY AND PURPOSE

For discharges of waste to land, water quality monitoring is required pursuant to the California Code of Regulations, Division 2, Title 27, Subdivision 1, Chapter 3, Subchapter 3, Sections 20380 through 20435. The principal purposes of an SMP are: (1) to document compliance with waste discharge requirements and prohibitions established by the Water Board, (2) to facilitate self-policing by the waste Discharger in the prevention and abatement of pollution arising from the waste discharge, (3) to develop or assist in the development of effluent standards of performance, and toxicity standards, and (4) to assist the Discharger in complying with the requirements of Title 27.

B. MONITORING REQUIREMENTS

Monitoring refers to the observation, inspection, measurement, and/or sampling of environmental media, waste management units (WMUs), containment and control facilities, and waste disposed in each WMU. The following defines the types of monitoring that may be required.

Monitoring of Environmental Media

The Water Board may require monitoring of groundwater, surface water, storm water, landfill gas and any other environmental media that may pose a threat to water quality or provide an indication of a water quality threat at the site.

Sample collection, storage, and analyses shall be performed according to the most recent version of EPA-approved methods or in accordance with a sampling and analysis plan approved by Water Board staff. Analytical testing of environmental media required by this SMP shall be performed by a California State approved laboratory for the required analyses. The director of the laboratory whose name appears on the certification shall be responsible for supervise of all analytical work in his/her laboratory and shall have signing authority for all reports or may designate signing of all such work submitted to the Water Board.

All monitoring instruments and devices used to conduct monitoring in accordance with this SMP shall be maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once every two years.

Standard Observations

Standard observations refer to observations within the limits of each WMU, at their perimeter, and of the receiving waters beyond their limits. Standard observations include:

1. WMUs:

    a. Evidence of ponded water at any point on the WMU
    b. Evidence of odors, including their presence or absence, characterization, source, and distance of travel from source
    c. Evidence of erosion and/or daylighted waste

2. Perimeter of WMUs:

    a. Evidence of liquid leaving or entering the WMU, estimated size of affected area and flow rate (show affected area on map)
    b. Evidence of odors, including their presence or absence, characterization, source, and distance of travel from source
    c. Evidence of erosion and/or daylighted waste

3. Receiving Waters:

    a. Floating and suspended materials of waste origin: including their presence or absence, source, and size of affected area
    b. Discoloration and turbidity: description of color, source, and size of affected area
    c. Evidence of odors, presence or absence, characterization, source, and distance of travel form source
    d. Evidence of beneficial use: presence of water associated with wildlife
    e. Flow rate
    f. Weather conditions: wind direction and estimated velocity, total precipitation

Facilities Inspections

Facilities inspections refer to the inspection of all containment and control structures and devices associated with WMUs. Containment and control facilities may include the following:

1. Asphalt or earthen covers
2. Perimeter drainage or diversion channels
3. Detention ponds or collection tanks

C. REPORTING REQUIREMENTS

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code and this Water Board's Resolution No.73-16 and Order No. 93-113. At a minimum, each Self Monitoring Report (SMR) shall include the following information:

1. **Transmittal Letter**: A cover letter transmitting the essential points shall be included with each monitoring report. The transmittal letter shall discuss any violations during the reporting period and actions taken or planned to correct the problem. The letter shall also certify the completion of all monitoring requirements. The letter shall be signed by the Discharger's principal executive officer or his/her duly authorized representative, and shall include a statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge.

2. **Graphic Presentation**: The following maps, figures, and graphs (if applicable) shall be included in each SMR to visually present data collected pursuant to this SMP:

    a. Plan-view maps showing all monitoring and sampling locations, waste management units, containment and control structures, treatment facilities, surface water bodies, and site/property boundaries
    b. Groundwater level/piezometric surface contour maps for each groundwater-bearing zone of interest showing inferred groundwater gradients and flow directions under/around each waste management unit, based upon the past and present water level elevations and pertinent visual observations
    c. Post-plot maps with analyte concentration posted adjacent to each sampling location and/or isoconcentration contour maps displaying analyte concentrations and sample locations
    d. Concentration vs. time graphs for key sampling parameters for each sampling location
    e. Geologic cross-sections showing groundwater-bearing zones, sample locations, contaminant sources, and the extent of contamination
    f. Any other maps, figures, photographs, cross-sections, graphs, and charts necessary to visually demonstrate the appropriateness and effectiveness of sampling, monitoring, characterization, investigation, or remediation activities relative to the goals of this SMP.

3. **Tabular Presentation**: The following data (if applicable) shall be presented in tabular form and included in each SMR to show a chronological history and allow quick and easy reference:

    a. Well designations
    b. Well location coordinates (latitude and longitude)
    c. Well construction (including top of well casing elevation, total well depth, screen interval depth below ground surface, and screen interval elevation)
    d. Groundwater depths
    e. Groundwater elevations
    f. Horizontal groundwater gradients

g. Vertical groundwater gradients (including comparison wells from different zones)
h. Phase-separated product elevations
i. Phase-separated product thicknesses
j. Current analytical results (including analytical method and detection limits for each constituent)
k. Historical analytical results (including at least the past five years unless otherwise requested)
l. Measurement dates
m. Groundwater extraction, including:
   (1) Average daily extraction rate
   (2) Total volume extracted for monitoring period
   (3) Cumulative total volume extracted since system inception
n. Contaminant mass removal, including:
   (1) Average daily removal rate
   (2) Total mass removed for monitoring period
   (3) Cumulative total mass removed since system inception

4. **Compliance Evaluation Summary and Discussion**:

a. A summary and certification of completion of all environmental media monitoring, standard observations, and facilities inspections
b. The quantity and types of wastes disposed of during the past quarter, and the locations of the disposal operations, if applicable
c. A description of the waste stream including the percentage of each waste type (e.g., residential, commercial, industrial, construction/demolition, etc.), if applicable
d. The signature of the laboratory director or his/her designee indicating that he/she has supervised all analytical work in his/her laboratory
e. Provide a discussion of the field and laboratory results that includes the following information:

   (1) Data Interpretations
   (2) Conclusions
   (3) Recommendations
   (4) Newly implemented or planned investigations & remedial measures
   (5) Data anomalies
   (6) Variations from protocols
   (7) Condition of wells
   (8) Effectiveness of leachate monitoring and control facilities

5. **Appendices:** The following information shall be provided as appendices in electronic format only unless requested otherwise by Water Board staff and unless the information is already contained in a Sampling and Analysis Plan approved by Water Board staff.

a. New boring and well logs
b. Method and time of water level measurements
c. Purging methods and results including the type of pump used, pump placement in the well, pumping rate, equipment and methods used to monitor field pH, temperature, and conductivity, calibration of the field equipment, pH, temperature,

conductivity, and turbidity measurements, and method of disposing of the purge water

d. Sampling procedures, field and travel blanks, number and description of duplicate samples, type of sample containers and preservatives used, the date and time of sampling, the name of the person actually taking the samples, and any other relevant observations
e. Documentation of laboratory results, analytical methods, detection limits, and Quality Assurance/Quality Control (QA/QC) procedures for the required sampling.

D. CONTINGENCY REPORTING

1. The Discharger shall report by telephone to the Water Board, any discharge from the disposal area immediately after it is discovered. The Discharger shall submit a written report with the Water Board within five days of discovery of any discharge. The written report shall contain the following information:

   a. A map showing the location(s) of discharge
   b. Approximate flow rate
   c. Nature of effects (e.g., all pertinent observations and analyses)
   d. Corrective measures underway or proposed

2. The Discharger shall submit a written report to the Water Board within seven days of determining that a statistically significant difference occurred between a self-monitoring sample set and an approved Water Quality Protection Standard (WQPS). The written report shall indicate what WQPS(s) have been exceeded. The Discharger shall resample at the compliance point(s) where this difference has been found within 30 days.

3. If re-sampling and analysis confirms the earlier finding of a statistically significant difference between self-monitoring results and WQPS(s) the Discharger shall, upon determination by the Executive Officer, submit to the Water Board an amended Report of Waste Discharge as specified in Title 27, Section 20420 for establishment of an Evaluation Monitoring program meeting the requirements of Title 27, Section 20425.

E. ELECTRONIC REPORTING FORMAT

In addition to print submittals, all SMRs submitted pursuant to this SMP must be submitted as electronic files in **PDF format**. The Water Board has implemented a document imaging system, which is ultimately intended to reduce the need for printed report storage space and streamline the public file review process. Documents in the imaging system may be viewed, and print copies made, by the public, during file reviews conducted at the Water Board's office. PDF files can be created by converting the original electronic file format (e.g., Microsoft Word) and/or by scanning printed text, figures and tables. Upon request by Water Board staff, monitoring results, including water level measurements, sample analytical results, coordinates, elevations, etc., shall be provided electronically in **Microsoft Excel® or similar spreadsheet format**. This format facilitates data computations and/or plotting that Water Board staff may undertake during their review. Data tables submitted in electronic spreadsheet format will not be included in the case file for public review. All electronic

files, whether in PDF or spreadsheet format, shall be submitted via the Water Board's file transfer protocol (FTP) site, email (only if the file size is less than 3 MB) or on CD. CD submittals may be included with the print report. Email notification should be provided to Water Board staff whenever a file is uploaded to the Water Board's FTP site.

F. MAINTENANCE OF WRITTEN RECORDS

Dischargers shall maintain information required pursuant to this SMP for at least five years. The five-year period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Water Board.

PART B

A. MONITORING LOCATIONS AND FREQUENCY

Monitoring locations, frequencies, parameters, and analytes are specified in Tables B-1, B-2, and B-3 of this SMP and as indicated below. Monitoring locations are shown in Figures B-1 and B-2.

1. Environmental Media

   a. Groundwater:

      Groundwater shall be monitored at the locations specified in Table B-1 and shown in Figure B-1. Monitoring frequencies, parameters, and analytes shall be in accordance with Table B-1.

   b. Leachate:

      Leachate shall be monitored at the locations specified in Table B-1 and shown in Figure B-1. Monitoring frequencies, parameters, and analytes shall be in accordance with Table B-1.

   c. Storm Water:

      Storm Water shall be monitored at the locations specified in Table B-1 and shown in Figure B-2. Monitoring frequencies, parameters, and analytes shall be in accordance with Table B-1.

2. Standard Observations

   Standard observations shall be made within the limits of each landfill cell, at their perimeter, and of the water courses and receiving waters beyond their limits. Standard observations shall be conducted at the locations and frequencies specified in Table B-2.

3. Facilities Inspections

   The Discharger shall inspect all containment and control structures and devices associated with each landfill cell and the landfill as a whole to ensure proper and safe operation. Facilities inspections shall be conducted at the locations and frequencies specified in Table B-3.

B. REPORTING SCHEDULE

The Dischargers shall submit SMRs to Water Board staff in accordance with the schedule indicated in Table B-4. Reports due at the same time may be combined into one report for convenience, as long as monitoring activities and results pertaining to each monitoring period are clearly distinguishable.

I, Bruce H. Wolfe, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedures set forth in this Water Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in this Water Board's Order No. R2-2007-0021,

2. Is effective on the date shown below,

3. May be reviewed or modified at any time subsequent to the effective date, upon written notice from the Executive Officer.

Bruce H. Wolfe
Executive Officer

Date Ordered: March 14, 2007

Attachments: SMP Tables B-1, B-2, B-3, & B-4
SMP Figures B-1 & B-2

Table B-1

Kirby Canyon Recycling and Disposal Facility, Self Monitoring Program (SMP) for Order No. R2-2007-0021

	Groundwater										Leachate			Storm Water							
	Cells 1, 2/5, & 3/4								Cell 7												
	Compliance Points				Water Levels Only				Compliance Points												
Parameter (Method)	MW-A1	MW-WB1	MW-UB1	MW-UB2	MW-A2	MW-A3	MW-A4	MW-WB2	MW-UB3	SPRING	Cell 1	L-02	L-03	SWM-1	SWM-2	SWM-3	SWM-4	SWM-5	SWM-6	SWM-7	RO1
Date Installed	Jul-91	Jul-93	Sep-97	Sep-97	Jul-91	Jul-93	Sep-97	Jul-93	Aug-04	NA											
Total Depth (ft bgs)	20.5	23	50	28.5	21	12	10	21.5	56	NA											
Screen Interval (ft bgs)	5.5 - 20.5	18 - 23	40 - 50	18 - 28	6 - 21	6 - 12	7.5 - 9.5	12.5 - 21.5	41 - 56	NA											
Zone Screened*	Alluvium	WB	UWB	UWB	Alluvium	Alluvium	Alluvium	WB	UWB	--											
Field Measurements																					
Water Elevation	Q	Q	Q	Q	Q	Q	Q	Q	Q	NA	NA	NA	NA	M Obs.	M Obs.	M Obs.	M Obs.	M Obs.	M Obs.	M Obs.	
Electrical Conductivity	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1		Twice	Twice		Twice			Discharge
pH	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1		Twice	Twice		Twice			Discharge
Temperature	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
Turbidity	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
Flow Rate (gallons/month)	NA	NA	NA	NA					NA	NA	Flow	Flow	Flow								
Laboratory Analyses																					
Site-Specific Detection Monitoring Parameters																					
Total Dissolved Solids (160.1)	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
Alkalinity (310.1)	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
VOCs (8260B)	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
THF (8260B)	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
MTBE (8260B)	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
Magnesium, dissolved (6010B)	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
Supplemental Hydrochemical Parameters																					
Calcium, dissolved (6010B)	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
Sodium, dissolved (6010B)	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
Potassium, dissolved (6010B)	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
Chloride (300.0)	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
Sulfate (300.0)	SA-1,3	SA-1,3	SA-1,3	SA-1,3					SA-1,3	SA-1,3	A-1	A-1	A-1								
Storm Water Parameters																					
Oil & Grease															Twice	Twice		Twice			Discharge
Total Suspended Solids (160.2)															Twice	Twice		Twice			Discharge
Iron (6010B)															Twice	Twice		Twice			Discharge
Constituents of Concerns (COCs) [1]	5-year	5-year	5-year	5-year					5-year	5-year											

Table B-1

Kirby Canyon Recycling and Disposal Facility, Self Monitoring Program (SMP) for Order No. R2-2007-0021

Notes and Explanations:

* Three zones are monitored beneath the site:
  Alluvium = 0 to 15 fbgs, characterized by alluvial and granular fill materials of sand, silt, & serpentinite chips; K ~ 10^{-4} cm/s.
  WB = Weathered Bedrock, 10 to 20 feet thick below alluvium. Gray, weathered serpentinite with iron-stained and limonite-filled fractures; K ~ 10^{-5} cm/s.
  UWB = Unweathered Bedrock, to > 100 feet below weathered bedrock. Dark gray-green fractured seprpentinite with opaque, light-green clay; K ~ 10^{-6} cm/s.

(1) Next 5-year Constituents of Concern sampling event will occur during third quarter of 2011.

KEY

M = monthly monitoring
Q = quarterly monitoring according to the following schedule:
  1st quarter = Jan thru Mar
  2nd quarter = Apr thru Jun
  3rd quarter = Jul thru Sep
  4th quarter = Oct thru Dec
S = Semi-annual monitoring
SA-1,3 = semi-annual monitoring during first and third quarters
A = Annual monitoring
A-1 = annual monitoring during first quarter
2A = biennial monitoring

M Obs. = Monthly stormwater observations during the rainy season - October to May.
Twice = Twice during the rainy season (October to May) beginning with the first storm event that produces significant flow.
Discharge = Discharge Event
NA = Not Applicable
-- = No Data
blank = no sampling required
VOCs = volatile organic compounds by EPA Method 8260B, Appendix I list of compounds.
SVOCs = semi-volatile organic compounds
MTBE = methyl tertiatry butyl ether
PCBs = polychlorinated biphenyls
THF = Tetrahydrofuran

Water Quality Protection Standard (WQPS) for the KCRDF

Constituents of Concern: Section 20395 of Title 27 defines Constituents of Concern (COCs) as "all waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit". COCs for the KCRDF include the "site-specific detection monitoring parameters" identified in Table B-1 of this SMP, and all Appendix II parameters in the federal Subtitle D regulations. The Discharger may propose modifications to the parameter list as additional data becomes available concerning site-specific source characteristics and natural background water quality. However, modifications shall only be made upon written concurrence from the Executive Officer.

Monitoring Parameters: Monitoring parameters (MPs), a subset of the COCs, are typically the most mobile and commonly detected COCs in groundwater at the site and are measured on a more frequent basis than the entire list of COCs. The MPs for the KCRDF shall include, at a minimum, all constituents identified as "site-specific detection monitoring parameters" in Table B-1 of this SMP. The Discharger may propose modification to the MPs as additional data become available concerning site-specific source characteristics and natural background water quality. However, modifications shall only be made upon written concurrence from the Executive Officer.

Concentration Limits: Pursuant to Title 27, Section 20400, the Discharger utilizes both statistically and non-statistically-derived concentration limits (CLs). Statistically-derived CLs that are based upon evaluation of natural background groundwater conditions. Intra-well Shewhart-CUSUM control charts are used to statistically evaluate the inorganic site-specific detection monitoring parameters. The Shewhart-CUSUM analytical test calculates a control limit to which each new result is compared. The cumulative sum of each new result is incorporated into the statistical calculation so that increasing trends are easily detected. In cases where the detection frequency for a given parameter in a given well is less than 25%, a non-parametric prediction limit in lieu of a Shewhart-CUSUM control chart will be used provided sufficient data are available. If the statistical tests indicate no change in groundwater quality, then the background dataset is updated every two-years to provide more robust statistical comparisons for future analysis.

The CL for organic compounds, which are not naturally occurring and not detected in background groundwater samples, shall be taken as the contract laboratory's practical quantification limit (PQL) of the analytical method used (e.g., US-EPA Methods 8260 and 8270), provided that the PQL is less than or equal to the applicable and enforceable water quality standard, such as the California maximum contaminant level (MCL) for each constituent. The repeated detection of one or more non-naturally occurring organic compound above the PQL in samples from groundwater monitoring points is evidence of a potential release from the Unit. If the laboratory cannot achieve a PQL that is less than or equal to the water quality standard, re-sampling must occur within 30 days with analysis at a state-approved laboratory that can achieve the CL requirements.

Point of Compliance: Title 27 defines the Point of Compliance (POC) as the "vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit." The POC for the KCRDF shall be the hydraulically downgradient perimeter of the waste fill area.

Monitoring Points: Title 27 defines Monitoring Points as "a well, device, or location specified in the waste discharge requirements at which monitoring is conducted and at which the water quality protection standard applies". Monitoring points for the KCRDF, which are located along the POC and at additional locations, are specified in Table B-1 of this SMP.

Table B-2 Standard Observations

STATION	FREQUENCY
WMUs	Weekly
WMU Perimeter	Weekly
Receiving Waters	Weekly

Table B-3 Facilities Inspections

CONTAINMENT AND CONTROL FACILITY	FREQUENCY
Leachate Collection and Removal Systems (LCRS)	Quarterly
Storm Water Impoundment (Sedimentation Pond)	Quarterly
Vadose Zone and Subdrain Collection Systems	Quarterly
Perimeter diversion channels	Quarterly
Leachate management facilities and secondary containment (Leachate Storage Impoundments, piping, treatment facilities, etc.)	Quarterly

Table B-4 Reports and Due Dates

Report Type	Reporting Frequency	Report Due Dates
Environmental Media Monitoring (Groundwater, Leachate, Storm Water, Landfill Gas)	Semi-Annual	**Aug 15, Feb. 15**
Standard Observations & Facilities Inspections	Semi-Annual	**Aug 15, Feb. 15**

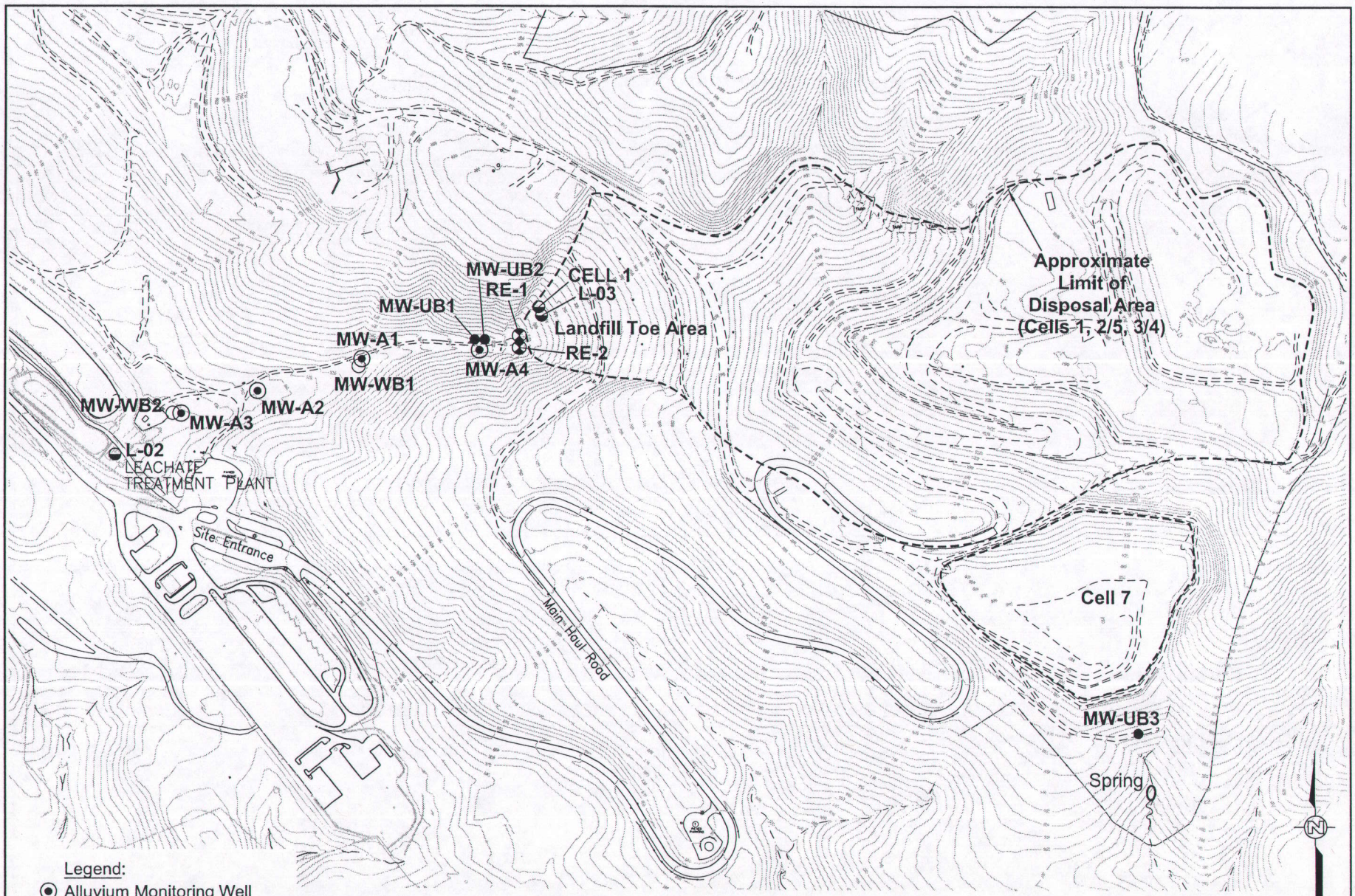


Figure B-1 - Groundwater and Leachate Monitoring Locations, KCRDF

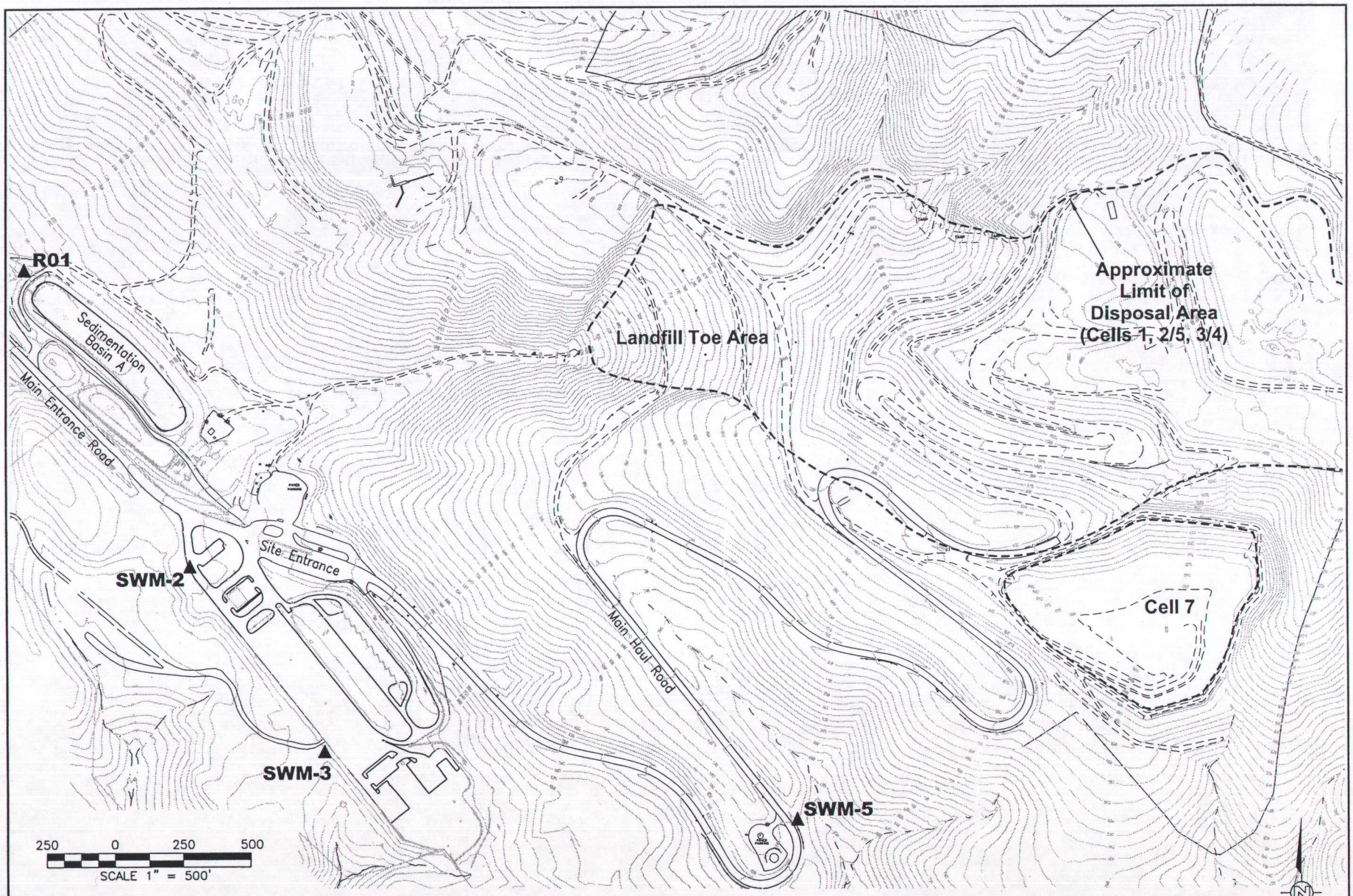


Figure B-2 - Storm Water Monitoring Locations, KCRDF

Legend:

▲ Storm Water Sampling Location

SWM-2