

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2005-0117
WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF RIO VISTA
RIO VISTA LANDFILL
CLASS III LANDFILL
POST-CLOSURE MAINTENANCE
AND CORRECTIVE ACTION
SOLANO COUNTY

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

1. The City of Rio Vista Department of Public Works (hereafter referred to as "Discharger") owns and operates the 12-acre Rio Vista Landfill, a closed Class III landfill on Airport Road approximately one mile north of Rio Vista, as shown in Attachment "A", which is incorporated herein and made part of this Order. The landfill is on a 20-acre site in Section 19, T4N, R3E, MDB&M, corresponding to Assessor Parcel Number 48-21-32.
2. The facility includes the landfill, associated access roads, monitoring wells, drainage facilities, and two storm water collection ponds, as shown in Attachment "B", incorporated herein and made part of this Order. The landfill is unlined and does not have a leachate collection and recovery system.
3. The landfill operated from the mid-1940s through 1992, accepting primarily household waste from the City of Rio Vista and the surrounding areas. The facility stopped accepting wastes on 1 January 1993 but was not closed until 2002. Since 1993, refuse from the area has been disposed of at the Potrero Hills landfill.
4. Previous Waste Discharge Requirements (WDRs) Order No. 94-272, issued prior to landfill closure, no longer adequately describes the facility.
5. Effective 18 July 1997, the water quality regulations for Class II and Class III disposal facilities formerly contained in Chapter 15, Title 23, California Code of Regulations (CCR), and the solid waste regulations formerly in Title 14, CCR, were consolidated into Chapters 1 through 7, Subdivision 1, Division 2, Title 27, CCR (Title 27). These WDRs implement Title 27 regulations and prescribe updated requirements for post-closure maintenance and corrective action monitoring for the closed landfill.
6. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated regulations (Title 40, Code of Federal Regulations, Parts 257 and 258, "federal municipal solid waste (MSW) regulations" or "Subtitle D") that apply, in California, to dischargers who own or operate Class II or Class III landfill units at which MSW is discharged. The majority of the federal MSW regulations became effective on the "Federal Deadline", which is 9 October 1993. The landfill is subject to all federal Subtitle D

regulations because it accepted MSW and does not qualify for any available exemptions. The landfill does not qualify for the limited exemption applicable to facilities that ceased accepting wastes prior to 9 October 1993 per 40 CFR 258.1(d) because it did not close within the following six-month period as required for the exemption. The landfill also does not qualify for the small landfill (i.e. < 20 tons per day) exemption per 40 CFR 258.1(f)(1) because there is evidence of groundwater impact from the unit.

WASTES AND UNIT CLASSIFICATION

7. The landfill accepted solid wastes defined as “inert” and “nonhazardous solid waste” under Sections 20230 and 20220 of Title 27, respectively. The landfill was not authorized to accept hazardous or liquid wastes.
8. The facility accepted approximately 12 tons (50 cubic yards) per day of waste, consisting of about 75 percent household waste, 23 percent commercial waste, and 2 percent industrial and demolition wastes. Reports on file indicate that the industrial wastes included:
 - a. Dried sewage sludge from the City’s wastewater treatment plant;
 - b. Empty pesticide containers; and
 - c. Drilling mud from oil and/or gas well construction. The quantity, characteristics and locations of the drilling mud disposed of are unknown.

It is estimated that 200,000 tons of wastes were discharged to the facility. Wastes were also salvaged, including about 2.5 tons per month of scrap metal.

9. The landfill is an existing, reclassified Class III waste management unit under Section 20080(d) of Title 27, since it operated prior to 27 November 1984 (i.e. the effective date of former Chapter 15 regulations).

SITE DESCRIPTION

10. The site is along the northern edge of the Sacramento-San Joaquin Delta about one mile northwest of the Sacramento River. Land to the south and west generally consists of low rolling hills and terrain, while land to north and east, part of the Sacramento River flood plain, is generally flat.
11. The site and adjacent lands to the northeast and southwest (approximately 560 acres total) were used in the 1950s for the disposal of dredge tailings from the Sacramento River. Portions of this dredge fill area have since been mined for sand, modifying the natural topography of the area.
12. Land within 1000 feet of the facility includes a sand quarry to the northeast, east and southeast, a mini-storage facility to the north and northwest, and roads and cattle pasture to the south and southwest. The Rio Vista airport is about one mile northwest of the site. Surrounding elevations range from about 32 feet above mean sea level (MSL) to the southwest along Airport Road to about 10 feet MSL in the adjacent sand quarry to the east.

13. There are approximately 16 wells within a one-mile radius of the site, including 7 municipal supply wells, 7 domestic wells and 2 agricultural supply wells. Most residences and businesses in the landfill vicinity are connected to the City of Rio Vista water system, which is supplied by the municipal supply wells. The municipal wells range in depth from 300 to 500 feet and none are down gradient of the landfill. There is one private domestic well on a parcel about 1,000 feet down gradient of the landfill. The City anticipates that this parcel will be connected to City water in the near future.
14. The site is not within a 100-year floodplain.

SURFACE AND STORM WATER

15. Surface drainage in the site area is to the Sacramento River.
16. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
17. The beneficial uses of the Sacramento River are municipal and domestic supply; agricultural supply; industrial; recreation; freshwater habitat; migration; spawning; wildlife and navigation.
18. The 100-year, 24-hour precipitation event is 3.46 inches as determined from Rainfall Depth Duration Frequency data provided by the State Department of Water Resources for the Rio Vista Station. The data indicates that the average 24-hour precipitation event at the station is 1.65 inches and the average annual precipitation is 16.20 inches.

GEOLOGY

19. The geology in the Rio Vista area generally consists of late Quaternary age sedimentary deposits from the Sacramento River, including Holocene age intertidal deposits (e.g. sand and peat) underlain by mid-Pleistocene older alluvium (silty/sandy clay, silty/clayey sand, and clay strata) and then by the Montezuma formation (clayey and pebbly sands). Beyond the dredge fill area surface soils consist of the intertidal deposits to the northeast, east and southeast, older alluvium to the northwest, and the Montezuma Formation to the southwest.
20. Boring logs from the site area show a 3 to 20 foot layer of dredge tailings (Tujunga fine sand) underlain by the older alluvium with occasional coarse to pebbly sand strata. Tests on non-remolded samples of clay strata in the older alluvium indicate permeabilities in the range of 1.8 to 5.0×10^{-8} cm/sec.
21. There are no known Holocene faults within 1000 feet of the facility. The closest active fault is the Midland Fault within two miles of the site, which has been characterized as producing a maximum credible earthquake of 7.0 on the Richter scale and a peak bedrock acceleration of 0.18 g. Two additional faults, the Vaca fault and the Kirby Hill fault, are about 13 miles west of the site.

GROUNDWATER

22. The beneficial uses of the ground water are domestic, municipal, agricultural, and industrial supply.
23. Groundwater ranges from about 30 to 40 feet below natural grade depending on surface location, corresponding to about 2 feet MSL. The minimum separation between the base of the landfill and historical high groundwater is estimated to be about 10 feet based on historical operations information on file. The groundwater gradient averages about 0.0008 ft/ft and is typically to the north or to the north-northeast (see Information Sheet).
24. There are five groundwater monitoring wells at the site (MWs-1 through 5), including two upgradient wells (MWs-3 and 4), two down gradient wells (MWs-1 and 5) and one side gradient well (MW-2).
25. Groundwater monitoring data shows an historical release from the landfill consisting of general minerals, as follows:

<i>Constituent</i>	<i>Concentration, mg/L</i>		
	<i>Upgradient</i>	<i>Downgradient¹</i>	
	<u>Historical Average</u>	<u>1998</u>	<u>2004</u>
Total Dissolved Solids	800	1,600	1,200
Chloride	55	500	225
Sulfate	55	150 ²	150 ²
Total Alkalinity	70 ³		760 ³

1. Based on MW-5 data except where noted.
 2. Average from MWs-1 and 5. Sulfate concentrations in MW-5 moderately increased while those in MW-1 moderately decreased).
 3. Based on single monitoring event in 2000.

Time series plots show moderate improvement in groundwater quality (e.g. 25 to 50 percent since 1998). No change in this trend has been observed since landfill closure in 2002.

26. Monitoring and Reporting Program Order No. R5-2005-0117 requires that the Discharger perform corrective action monitoring to monitor the release and the progress of corrective action.

LANDFILL CLOSURE

27. In 1999 the Executive Officer issued Cleanup and Abatement Order (CAO) No. 99-721 to the Discharger after the Discharger failed to comply with schedules for closure and corrective action in 1994 WDRs. The CAO required the Discharger to close the landfill as a corrective action to prevent further groundwater impacts at the site. The CAO included schedules for submission of a Final Closure Plan and landfill closure in accordance with Title 27 regulations.

28. In response to the CAO, the Discharger submitted a January 2000 Final Closure Plan (*City of Rio Vista Closure Plan*, prepared by Whitley, Burchett and Associates), as amended on 15 September 2000. The cover design included the following elements per Title 27 requirements:
- Foundation Layer – 1 ½ - 2 feet of compacted soil
 - Low Hydraulic Conductivity (LHC) Layer – 1 foot of compacted clay ($k \leq 1 \times 10^{-6}$ cm/sec)
 - Erosion Resistant Layer – 1 foot of clean vegetative cover soil
 - Vegetative Cover – native grass mix

The Final Closure Plan (FCP) demonstrated per Section 21090(a)(2) that the foundation layer met the performance standards of Title 27 even though not strictly prescriptive (i.e. it was less than two feet in places). Board staff approved the FCP in December 2000.

29. The Discharger initiated landfill closure in 2001. The foundation layer was constructed using existing intermediate cover soil and onsite borrow, while the LHC layer was constructed using local Montezuma clay. The vegetative cover layer was constructed using local borrow soil and was then hydroseeded. The construction work was completed in October 2001 and documented in a March 2002 certification report (Report-Construction Quality Assurance (CQA) for Landfill Closure Cap, Rio Vista Landfill, prepared by Montgomery Watson Harza). The landfill cover was extensively damaged by storm water erosion during the 2001-02 wet season, however, and the certification report was not approved until repairs were completed (see Finding 32).

Slopes

30. The steepest final cover slopes, about 3.5:1 horizontal-to-vertical, were constructed along the east and northeast side slopes of the landfill. The corresponding static and seismic safety factors were calculated to be 2.4 and 1.6, respectively. The landfill crest and southern flank was constructed with less than a three percent slope longitudinally, but with a three percent minimum slope along the sides for drainage (see Attachment B: Site Map). Landfill elevations range from about 35 feet MSL along the unit perimeter to 50 feet MSL at the crest.

Drainage

31. The western half of the landfill drains to a storm water collection pond on the southwestern side of the site along Airport Road, while the eastern half of the landfill drains to a storm water pond in the eastern corner of the site. The southwestern pond receives runoff from the northwestern slopes via a perimeter ditch along the northern side of the site, and direct sheet flows from the western flank and side slopes drains. The eastern pond receives runoff from the northeastern slopes via a bench drain, runoff directed by cover swales from the central flank, and direct sheet flow from the adjacent slopes. Since the landfill is above surrounding terrain, there is no run-on.

The drainage facilities and both storm water ponds have sufficient capacity to accommodate a 24-hour, 100-year storm event. There is no surface water discharge from the ponds, which allow percolation to groundwater and also have sufficient capacity to contain precipitation from a 100-year wet season (about 29 inches).

32. A January 2002 Board staff site inspection found severe erosion gullies from storm water runoff along the cover slopes, especially near the eastern pond where much of the eroded cover soil had been deposited. Extensive ponding was also noted on the landfill crest. The inspection found that the Discharger had failed to implement adequate storm water control measures to protect areas that had not yet been stabilized and had failed to adequately winterize facility roads, impeding access to damaged areas for repairs. The Discharger had also failed to conduct required standard observations that would have detected the damage earlier, and failed to notify Board staff of the damage after it had been discovered. A February 2002 Notice of Violation issued for these violations required the Discharger to submit and implement a work plan for repairs as an addendum to the FCP. The repair work included:
- a. Filling in and re-compacting the erosion gullies;
 - b. Buttressing of the northeastern side slope and installation of a 10 foot wide bench and bench drain;
 - c. Removing debris from the drainage ditches and storm water ponds; and
 - d. Implementation of interim controls to protect repaired areas (i.e. jute matting, hay bales, and hay logs).

The repair work was completed in the summer of 2002 and documented in a February 2003 addendum to the closure certification report.

Landfill Gas

33. There are not currently any landfill gas (LFG) monitoring wells at the site and concentrations of methane in the landfill gas have not yet been determined. The Discharger is planning to install 3 gas wells along the western site perimeter as required by the Local Enforcement Agency (see Attachment B: Site Map). Closure included installation of 4 landfill gas vents spaced 200 feet apart along the spine of the landfill crest and southwestern flank.

COST ESTIMATES AND FINANCIAL ASSURANCES

34. The Discharger is required to demonstrate financial assurances for post-closure maintenance to the California Integrated Waste Management Board (CIWMB) pursuant to Section 22210(b), since the landfill was operated after January 1, 1988. The 1999 FCP provided estimates for the cost of landfill maintenance and monitoring, including groundwater monitoring, totaling approximately \$17,500 per year in 2005 dollars (\$13,000 in 1999 dollars). The Discharger has established a Pledge of Revenue with the CIWMB to cover these annual costs. Provision G.9 of these WDRs requires that the Discharger submit an addendum to the FCP/post-closure maintenance plan with updated cost estimates for post-closure maintenance and monitoring.

35. The Discharger is required to demonstrate financial assurances for corrective action to the CIWMB pursuant to Section 22220(b), since the landfill was operated after July 1, 1991. The Discharger has an enterprise account for closure and corrective action funded by franchise revenues that includes \$117,800 for further corrective action-related activities at the site. These WDRs (Provision G.9) require that the Discharger include updated cost estimates for further corrective action in an addendum to the FCP/post-closure maintenance plan.

CEQA AND OTHER CONSIDERATIONS

36. The action to revise the WDRs is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.), in accordance with Title 14, CCR Section 15301 for existing facilities.
37. Section 13267(b) of California Water Code provides that: “In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.” The monitoring and reporting program required by this Order (Monitoring and Reporting Program No. R5-2005-0117, attached) is necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges the waste subject to this Order.
38. On 17 June 1993, the State Water Resources Control Board adopted Resolution No. 93-62 implementing a State Policy for the construction, monitoring, and operation of MSW landfills that is consistent with the federal MSW regulations promulgated under Title 40, Code of Federal Regulations, Part 258 (Subtitle D). Title 27 incorporates *State Water Resources Control Board (SWRCB) Resolution No. 93-62*.
39. This order implements:
- a. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition;*
 - b. Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions;
 - c. The prescriptive standards and performance criteria of RCRA Subtitle D, Part 258; and
 - d. State Water Resources Control Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993.

PROCEDURAL REQUIREMENTS

40. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
41. The Regional Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
42. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
43. Any person affected by this action of the Regional Board may petition the State Water Resources Control Board to review the action in accordance with Sections 2050 through 2068, Title 23, California Code of Regulations. The petition must be received by the State Water Resources Control Board, Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812, within 30 days of the date of issuance of this Order. Copies of the laws and regulations applicable to the filing of a petition are available on the Internet at http://www.waterboards.ca.gov/water_laws/index.html and will be provided on request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order No. Order No. 94-272 is rescinded, and that the City of Rio Vista, its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. The discharge of new or additional waste to the landfills at this facility is prohibited.
2. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.
3. The discharge of treated or untreated wastewater or groundwater to any surface water or any surface water drainage course is prohibited without a National Pollutant Discharge Elimination System (NPDES) permit authorizing the discharge.
4. The landfill shall not cause pollution or a nuisance, as defined by the California Water Code, Section 13050, and shall not cause degradation of any water supply.
5. The discharge shall not cause any increase in the concentration of waste constituents in soil-pore gas, soil-pore liquid, soil, or other geologic materials outside of the Unit if such waste constituents could migrate to waters of the State — in either the liquid or the gaseous phase — and cause a condition of nuisance, degradation, contamination, or pollution.

B. DISCHARGE SPECIFICATIONS

1. The discharge shall remain within the designated disposal area at all times.
2. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.
3. Storm water runoff from the facility shall be monitored in accordance with Monitoring and Reporting Program No. R5-2005-0117 and applicable storm water regulations.
4. A minimum separation of five feet shall be maintained between wastes or leachate and the highest anticipated elevation of underlying groundwater per Section 20240(c) of Title 27.

C. POST-CLOSURE SPECIFICATIONS

1. Areas with slopes greater than ten percent, surface drainage courses, and areas subject to erosion by wind or water shall be maintained to prevent such erosion (also see Section IX.G.6, *CLOSURE AND POST-CLOSURE SPECIFICATIONS*, April 2000 Standard Provisions).
2. All final cover slopes shall be capable of withstanding a maximum probable earthquake.
3. The final cover shall be graded and maintained to prevent ponding, promote lateral runoff, and prevent soil erosion due to high run-off velocities.
4. The erosion-resistant layer shall be maintained with native or other vegetation capable of providing effective erosion resistance. The vegetation shall not have a rooting depth greater than the erosion-resistant layer thickness.
5. Precipitation and drainage control systems shall be designed, constructed, operated and maintained to convey peak flows from a 100-year, 24-hour storm event.
6. The closed landfills shall be maintained to prevent, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, and washout.
7. The Discharger shall conduct an aerial site survey of the site for the purpose of updating the topographic map for the site at least every five years (also see Section IX.I, *CLOSURE AND POST-CLOSURE SPECIFICATIONS*, April 2000 Standard Provisions).
8. Annually, prior to the anticipated rainy season but no later than **31 October**, any necessary erosion control measures shall be implemented and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent storm water flows from:

- a. Contacting or percolating through wastes,
- b. Causing erosion or inundation of the landfill cover or other areas of the site, or
- c. Causing sedimentation and clogging of the storm drains.

D. FACILITY SPECIFICATIONS

1. The Discharger shall immediately notify the Regional Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions that could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
2. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements. All storm water controls, including drainage facilities, shall be maintained so that they function effectively during precipitation events.
3. Methane and other landfill gases shall be adequately vented, removed from the Unit, or otherwise controlled to prevent the danger of adverse health effects, nuisance conditions, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.
4. All wells within 500 feet of the waste management units shall have sanitary seals that meet the requirements of the Solano County Environmental Management Department or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Board and to the State Department of Water Resources.

E. MONITORING SPECIFICATIONS

1. The Discharger shall conduct groundwater and surface water monitoring, as specified in Monitoring and Reporting Program (MRP) No. R5-2005-0117. Groundwater monitoring shall include background monitoring and corrective action monitoring. Background monitoring shall be conducted for the purpose of establishing concentration limits as part of the Water Quality Protection Standard per Section 20400(a) of Title 27. Corrective action monitoring shall be conducted for the purpose of assessing the nature and extent of the release, designing corrective action measures, and for assessing the progress of corrective action (Section 20430(d)).
2. The Discharger shall provide Regional Board staff a minimum of **one-week** notification prior to commencing any field activities related to the installation, non-routine repair, or abandonment of monitoring devices. The Discharger shall also provide Regional Board staff with a sampling schedule at least 48 hours prior to initiation of each detection, evaluation, or corrective action monitoring event conducted pursuant to MRP No. R5-2005-0117.
3. The Discharger shall comply with the Water Quality Protection Standard as specified in MRP No. R5-2005-0117 and the Standard Provisions.

4. The concentrations of the constituents of concern in waters passing the Point of Compliance shall not exceed concentration limits established in accordance with MRP No. R5-2005-0117.
5. The Discharger shall maintain and implement a Sample Collection and Analysis Plan that includes the following elements:
 - a. Sample collection procedures describing purging techniques, sampling equipment, and decontamination of sampling equipment;
 - b. Sample preservation information and shipment procedures;
 - c. Sample analytical methods and procedures; Sample quality assurance/quality control (QA/QC) procedures; and
 - d. Chain of Custody control.
6. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless the Executive Officer approves a longer time period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible.
7. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) *Methods for the Analysis of Organics in Water and Wastewater* (USEPA 600 Series), (2) *Test Methods for Evaluating Solid Waste* (SW-846, latest edition), and (3) *Methods for Chemical Analysis of Water and Wastes* (USEPA 600/4-79-020), and in accordance with the approved sampling plan.
8. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology shall be submitted for review and approval by the Executive Officer prior to use.
9. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., "trace" or "ND") in data from background monitoring points for that medium, the analytical method having the lowest method detection limit (MDL) shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
10. **"Trace" results** - results falling between the MDL and the practical quantitation limit (PQL) - shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run.

11. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs.
12. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The **MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result.** The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.
13. **Unknown chromatographic** peaks shall be reported, along with an estimate of the concentration of the unknown analyte. When unknown peaks are encountered, second column or second method confirmation procedures shall be performed to attempt to identify and more accurately quantify the unknown analyte.
14. All **QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.

MONITORING DATA ANALYSIS

15. All monitoring data analysis methods shall be consistent with the performance standards specified in Section 20415(e)(9) and sampling standards specified in Section 20415(e)(12).
16. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Section 20415(e)(7) of Title 27 that is used in the statistical method shall be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the WDRs for routine laboratory operating conditions that are available to the facility. The Discharger's technical report, pursuant to Section 20415(e)(7) of Title 27, shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, California Code of Regulations, for guidance when specifying limits of precision and accuracy.

For any given constituent monitored at a background or down gradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a “trace” detection) shall be identified and used in appropriate statistical or nonstatistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory’s concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of “ties”.

17. For inorganic monitoring parameters and COCs for which at least 10% of the data from background samples equal or exceed their respective MDL, the Discharger shall use the Tolerance Interval statistical method for background and corrective action monitoring, or an alternate statistical method approved by the Executive Officer in accordance with Section 20415(e)(8)(E), to establish concentration limits pursuant to Section 20400 of Title 27. The Discharger shall conclude that any analyte that exceeds its concentration limit provides a preliminary indication [or, for a retest, provides measurably significant evidence] of a release at that monitoring point. Any COC confirmed by retest as part of a release shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event. The statistical method shall take into account any seasonality in the groundwater quality data.
18. For inorganic monitoring parameters and COCs for which less than 10% of the data from background samples equal or exceed their respective MDL, the Discharger shall use a nonstatistical data analysis method for determining concentration limits and detecting a release. The Discharger shall use the following trigger for these constituents:
 - a. From the constituent of concern or monitoring parameter list, identify each analyte in the current sample that exceeds its MDL. The Discharger shall conclude that the exceedance provides a preliminary indication [or, for a retest, provides measurably significant evidence] of a release (existing or new) at that monitoring point, if the data contains an analyte that exceeds its PQL.

Any COC confirmed by retest as part of a release shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event.

19. For VOCs and other organic COCs (i.e. non-naturally occurring COCs) the Discharger shall use a nonstatistical data analysis method for determining concentration limits and detecting a release. The Discharger shall use the following trigger these constituents:
 - a. From the constituent of concern or monitoring parameter list, identify each analyte in the current sample that exceeds either its respective MDL or PQL. The Discharger shall conclude that the exceedance provides a preliminary indication [or, for a retest, provides measurably significant evidence] of a release (existing or new) at that monitoring point, if either:
 - 1) The data contains two or more analytes that equal or exceed their respective MDLs; or

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

Any COC confirmed by retest as part of a release shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event.

Discrete Retest

20. If the above statistical or non-statistical trigger procedures used for groundwater monitoring data analysis provide a preliminary indication of a new release or a previously unconfirmed constituent of the existing release at a given monitoring point, the Discharger shall immediately notify Regional Board staff by phone or e-mail and, within 30 days of such indication, shall collect *two* new (retest) samples from the monitoring point where the release is preliminarily indicated.
 - a. For any given retest sample, the Discharger shall include, in the retest analysis, only the laboratory analytical results for those analytes detected in the original sample. As soon as the retest data are available, the Discharger shall apply the same tests [i.e. 17.a for statistical constituents, 18.a or 19.a for non-statistical constituents], to separately analyze each of the two suites of retest data at the monitoring point where the release is preliminarily indicated.
 - b. If either (or both) of the retest samples trips the applicable trigger above (17.a, 18.a or 19.a), then the Discharger shall conclude that there is measurably significant evidence of a release at that monitoring point for the analyte(s) indicated in the validating retest sample(s) and shall:
 - 1) Immediately notify the Regional Board about the constituent verified to be present at the monitoring point, and follow up with written notification submitted by certified mail within seven days of validation; and
 - 2) Comply with 21, below.

Exceedances that the Discharger demonstrates (per Section 20420(k)(7) of Title 27) are the result of sample corruption, laboratory interferences, error, natural variation in the groundwater or other cause not associated with a release from the unit shall not trigger notification of a tentative release, and shall not trigger a retest unless a retest is necessary to make the demonstration. Exceedances for any other constituents for which the Discharger fails to conduct a retest will be considered confirmed without retest. Exceedances for constituents that have been previously confirmed as part of the release at a given monitoring point, including regularly detected COCs and COCs that are sporadically detected (e.g. as a result of seasonal or lateral fluctuations in the plume), shall be considered confirmed without notification and retest.

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

22. The data analysis methods shall also include trend analysis using time series plots and an evaluation of the water chemistry by appropriate methods (e.g., Piper diagram, ion balance, stiff diagram etc) to monitor the effectiveness of corrective action measures in accordance with Section E.3.C of the MRP. The trigger requirement for performing trend analysis shall be at least 4 historical data points above the PQL.

F. REPORTING REQUIREMENTS

1. The Discharger shall comply with the reporting requirements specified in this Order, in Monitoring and Reporting Program Order No. R5-2005-0117 and in the April 2000 Standard Provisions.
2. The discharger shall **mail a copy of each** monitoring **report** and any other reports required by this Order to:

California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670
(or the current address if the office relocates)

3. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report.
4. All reports and transmittal letters shall be signed by persons identified below:
 - a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor.
 - c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
 - d. A duly authorized representative of a person designated in a, b or c above if;
 - 1) The authorization is made in writing by a person described in a, b, or c of this provision;

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

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

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

5. Each monitoring report shall include a compliance evaluation summary. The summary shall contain at least:
 - a. For each monitoring point and background monitoring point addressed by the report, a description of:
 - i. The time of water level measurement;
 - ii. The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
 - iii. The method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;
 - iv. The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
 - v. A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.
 - b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.

- c. For each groundwater body, a description and graphical presentation of the gradient and direction of groundwater flow under/around the Unit, and the groundwater flow rate, based upon water level elevations taken prior to the collection of the water quality data submitted in the report.
- d. Laboratory statements of results of all analyses evaluating compliance with requirements.
- e. An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities.
- f. A summary and certification of completion of all **Standard Observations** for the Unit(s), for the perimeter of the Unit, and for the receiving waters. The Standard Observations shall include:
 - i. For the Unit:
 - 1) Evidence of ponded water at any point on the facility (show affected area on map);
 - 2) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - 3) Evidence of erosion and/or of day-lighted refuse.
 - ii. Along the perimeter of the Unit:
 - 1) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
 - 2) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - 3) Evidence of erosion and/or of day-lighted refuse.
 - iii. For receiving waters:
 - 1) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
 - 2) Discoloration and turbidity - description of color, source, and size of affected area;
 - 3) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
 - 4) Evidence of water uses - presence of water-associated wildlife;

- 5) Flow rate; and
 - 6) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.
6. The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional Board covering the reporting period of the previous monitoring year. This report shall contain:
- a. All monitoring parameters and constituents of concern shall be graphed so as to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot down gradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
 - b. Unless otherwise exempted by the Executive Officer, all monitoring analytical data obtained during the reporting periods for the year shall be submitted in tabular form as well as in a digital file format acceptable to the Executive Officer. The Regional Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [§20420(h)], in that this facilitates periodic review by the Regional Board.
 - c. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
 - d. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.
 - e. An evaluation of the effectiveness of the leachate monitoring/control facilities.

Notifications

7. The Discharger shall immediately notify the Regional Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions that could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
8. The Discharger shall notify the Regional Board in writing of any proposed change in ownership or responsibility for construction or operation of the landfill. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Regional Board requesting transfer of the Order within 14 days of assuming ownership or operation of this facility. The request must contain the

requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Regional Board, and a statement. The statement shall comply with the signatory requirements contained in the Standard Provisions (Reporting Requirement 4) and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer of this Order shall be approved or disapproved by the Regional Board.

9. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Regional Board office by telephone **as soon as** it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.
10. The Discharger shall report by telephone any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the Regional Board **within seven days**, containing at least the following information:
 - a. A map showing the location(s) of seepage;
 - b. An estimate of the flow rate;
 - c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);
 - d. Verification that samples have been submitted for analyses of the Constituents of Concern and Monitoring Parameters, and an estimated date that the results will be submitted to the Regional Board; and
 - e. Corrective measures underway or proposed, and corresponding time schedule.
11. The Discharger shall also notify the Regional Board of any proposed land use or closure plan changes. This notification shall be given 90 days prior to the effective date of the change and shall be accompanied by an amended Report of Waste Discharge and any technical documents that are needed to demonstrate continued compliance with these waste discharge requirements.

Records

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

Such legible records shall show the following for each sample:

- a. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
 - b. Date, time, and manner of sampling;
 - c. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
 - d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
 - e. Calculation of results; and
 - f. Results of analyses, and the MDL and PQL for each analysis.
13. The Discharger shall maintain a copy of this Order and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

G. PROVISIONS

1. The Discharger shall comply with the Monitoring and Reporting Program No. R5-2005-0117, which is attached to and made part of this order. A violation of the MRP is a violation of these waste discharge requirements.
2. The Discharger shall comply with the *Standard Provisions and Reporting Requirements* (Standard Provisions), dated April 2000, which are hereby incorporated into this Order. The Standard Provisions contain important provisions and requirements with which the Discharger must comply. A violation of any of the Standard Provisions and Reporting Requirements is a violation of these waste discharge requirements.
3. The Discharger or persons employed by the Discharger shall comply with all notice and reporting requirements of the State Department of Water Resources with regard to construction, alteration, destruction, or abandonment of all monitoring wells used for compliance with this Order or with Monitoring and Reporting Program No. R5-2005-0117 required by Section 13750 through 13755 of the California Water Code.
4. The Discharger shall maintain waste containment facilities, the landfill final cover, precipitation and drainage controls, monitoring wells, and shall continue to monitor ground water and surface waters per Monitoring and Reporting Program No. R5-2005-0117 throughout the post-closure maintenance period.
5. The post-closure maintenance period shall continue until the Regional Board verifies that remaining waste in the landfill will not threaten water quality.
6. The owners of the waste management facility shall have the continuing responsibility to assure protection of usable waters from discharged wastes and from gases and leachate

generated by discharged wastes during the closure and post-closure maintenance period of the landfill and during subsequent use of the property for other purposes.

7. The Discharger shall submit semiannual corrective action progress reports in accordance with MRP No. R5-2005-0117 and Section 20430 of Title 27. Each progress report shall address the following issues:
 - a. The source of the impact.
 - b. The nature and extent of the release.
 - c. Whether the size of the plume and concentrations of constituents within have increased, decreased or have not changed.
 - d. The effectiveness of landfill closure as a corrective action.
 - e. The need for additional corrective action measures and/or monitoring wells.

The reports shall include plans for the installation any additional monitoring wells necessary to define the extent of the release and/or monitor the progress of corrective action.

8. If the Discharger or Regional Board determines that the corrective action program is not adequate (i.e. does not satisfy the provisions of Section 20430), the Discharger shall, within 90 days of making the determination, or of receiving written notification from the Regional Board of such determination, submit an amended report of waste discharge (RWD) to make appropriate changes to the program. The amended RWD shall include the following:
 - a. A discussion as to why existing corrective action measures have been ineffective or insufficient.
 - b. A revised evaluation monitoring plan if necessary to further assess the nature and extent of the release
 - c. A discussion of corrective action needs and options.
 - d. Proposed additional corrective action measures, as necessary, for:
 - i. Source control,
 - ii. Adequate separation from groundwater,
 - iii. Groundwater cleanup, and/or
 - iv. Landfill gas control
 - e. A plan to monitor the progress of corrective action measures consistent with the MRP
 - f. Cost estimates for implementing additional corrective action, including monitoring
 - g. An implementation schedule.
9. The Discharger shall update the Final Post-Closure Maintenance Plan as necessary to reflect current operations and requirements under these WDRs and MRP No. R5-2005-0117. The plan shall include updated cost estimates for post-closure maintenance, monitoring and any additional corrective action measures that may be necessary to comply with these WDRs. A copy of the updated plan shall be provided to the Regional Board by **30 September 2005**.

10. The Discharger shall maintain assurances of financial responsibility for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill in an amount approved by the Executive Officer, and shall submit the financial assurance mechanism to the Financial Assurances Section of the California Integrated Waste Management Board.
11. The Discharger is required to maintain financial assurance mechanisms for post-closure maintenance costs as specified in Chapter 6 of Title 27. The Discharger is required to submit the financial assurance mechanism to the Financial Assurances Section of the California Integrated Waste Management Board, which determines if the mechanism meets the requirements of Chapter 6, Title 27, and if the amount of coverage is adequate.
12. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.
13. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of the Order.
14. The Regional Board will review this Order periodically and will revise these requirements when necessary.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 5 August 2005.

THOMAS R. PINKOS, Executive Officer

JDM

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2005-0117
MONITORING AND REPORTING PROGRAM
CITY OF RIO VISTA
RIO VISTA LANDFILL
CLASS III LANDFILL
POST-CLOSURE MAINTENANCE
AND CORRECTIVE ACTION
SOLANO COUNTY

The 12-acre, unlined municipal solid waste (MSW) landfill operated from the mid-1940s through 1992 and was closed with a clay cover in 2002. The 20-acre site includes the landfill, access roads, drainage facilities, two storm water collection ponds, gas vents and monitoring wells, and groundwater monitoring wells. The direction of groundwater flow varies from north to north-northeast. The depth to groundwater is about 30 to 40 feet below natural grade. The minimum separation between the base of the landfill and historical high groundwater is about 10 feet. Groundwater monitoring data shows an historical release from the landfill consisting of general minerals, including total dissolved solids (1,200 mg/L), chloride (225 mg/L), sulfate (150 mg/L) and alkalinity (760 mg/L). Time series plots show moderate improvement in groundwater quality since 1998 but do not yet indicate any observable improvement attributable to landfill closure in 2002.

Pursuant to Section 20080(d)(1) of Title 27, the Discharger shall maintain water quality monitoring systems for background and corrective action monitoring. Compliance with this MRP is ordered by Waste Discharge Requirements (WDRs) Order No. R5-2005-0117.

A. SUMMARY OF MONITORING & REPORTING FREQUENCIES

Table A

Section	Reporting	Frequency
B.	Periodic Reports:	
	1. Semiannual Report	Semiannually
	2. Annual Monitoring Summary Report	Annually
	3. Constituents of Concern Report	Every 5 years
C.	Water Quality Protection Standard Report	Update as necessary
Section	Monitoring	Frequency
D.	Leachate Monitoring	Same as F.1
E.	Groundwater Monitoring:	
	1. Elevation	Quarterly
	2. Background & Corrective Action Monitoring	Semiannually
	3. Constituents of Concern	Every 5 years

- | | | |
|----|-----------------------------------|---------------------------|
| F. | Facility Monitoring: | |
| | 1. Standard Observations | |
| | A. Wet Season | Monthly |
| | B. Dry Season | Quarterly |
| | 2. Maintenance Inspections | Quarterly |
| | 3. After Significant Storm Events | Within 7 Days After Event |
| | 4. Site Winterization | Annually |

B. REPORTING

1. Semiannual Reports

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required under Order No. R5-2005-0117 and the Standard Provisions and Reporting Requirements (April 2000). Reports shall be submitted **semiannually**. Each semiannual monitoring report shall include the following information:

- A. A compliance evaluation summary for the monitoring period.
- B. A tabular summary of well information from the installation logs, including well name, top-of-casing elevation, total depth, depths/elevations of screened interval, aquifer or zone (i.e. uppermost), and soil type(s) over the screened interval.
- C. The results of groundwater elevation monitoring.
- D. Tabular summaries of corrective action monitoring data for each unit showing sampling dates, well, constituents, concentrations, and concentration limits. The table shall also clearly show whether new monitoring data exceedances occurred during the monitoring period (i.e. highlight exceedances).
- E. Contaminant contour maps of representative corrective action monitoring data, showing the estimated extent of the contaminant plume.
- F. Tables of historical monitoring data for each unit showing well, sampling dates, constituents, concentrations, and concentration limits. The data shall be presented so as to clearly show historical concentrations at each well.
- G. Plots, graphical summaries and a narrative discussion of the results of correction action monitoring, as specified in Section E.3 herein.
- H. Field and laboratory tests sheets.
- I. An electronic copy of the data in a digital format acceptable to the Executive Officer. At least one semiannual monitoring report each year shall include a copy of the Sample Collection and Analysis Plan (sampling plan) referenced under WDR Monitoring Specification E.5.

2. Annual Monitoring Summary Report

An Annual Monitoring Summary Report (Annual Report) shall also be prepared and submitted in accordance with this section of the MRP and Reporting Requirement F.6 of the WDRs. The report shall summarize monitoring results for the prior year and include a discussion of compliance with the WDRs and the Water Quality Protection Standard. The report shall contain both tabular and graphical summaries, including time series plots of historical monitoring data (including the prior year's data) for each monitoring

parameter/COC. For corrective action monitoring data, the report shall also include the following:

- A. A summary of the results of trend analysis performed on each constituent of the release during the prior year
- B. A summary of the results of water chemistry analysis of water quality data collected during the prior year.
- C. Contaminant contour maps for representative constituents (e.g. TDS and chloride) constructed as part of semiannual reporting during the prior year and a discussion as to whether the size of the plume and concentrations within have increased, decreased, or remained the same since the previous monitoring year.

The Annual Report may be included in the Second Semiannual Report for each year.

Reports which do not comply with the above-required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the waste discharge requirements. The semiannual and annual reports shall be submitted to the Board in accordance with the following schedule for the calendar period in which samples were taken or observations made:

Table B

<u>Report</u>	<u>End of Reporting Period</u>	<u>Date Report Due</u>
First Semiannual	30 June	31 July
Second Semiannual	31 December	31 January
Annual Report	31 December	31 January

C. WATER QUALITY PROTECTION STANDARD (Section 20390)

The Water Quality Protection Standard (WQPS) shall consist of all Constituents of Concern, Concentration Limits for each constituent of concern, Monitoring Points, Point of Compliance, and the Compliance Period.

1. Constituents of Concern (Section 20395 of Title 27)

The constituents of concern (COCs) for the landfill shall be as follows:

Table C

Constituents of Concern	Units	Test Method
Field Parameters:		See Attachment D
General Minerals:		See Attachment D
Inorganics (dissolved)	µg/L	See Attachment D
Volatile Organic Compounds	µg/L	USEPA Method 8260B
Semi-Volatile Organic Compounds	µg/L	USEPA Method 8270
Organophosphorus Pesticides	µg/L	USEPA Method 8141A
Chlorinated Herbicides	µg/L	USEPA Method 8151
Organochlorine Pesticides	µg/L	USEPA Method 8081A
Polychlorinated Biphenols (PCBs)	µg/L	USEPA Method 8082

2. Concentration Limits (Section 20400)

- a. For VOCs and other organic COCs the concentration limit shall be the MDL.

- b. For inorganic monitoring parameters and COCs for which at least 10% of the data from background samples equal or exceed their respective MDL, the concentration limit shall be determined as follows:
 - i. Using the Tolerance Interval statistical procedure applied to historical background data, or
 - ii. Using an alternative statistical method approved by the Executive Officer per Monitoring Specification E.17 of the WDRs.
- c. For inorganic monitoring parameters and COCs for which less than 10% of the data from background samples equal or exceed their respective MDL, the concentration limit shall be the PQL.

Prior to calculating/updating concentration limits, background data shall be screened for significant rising or falling trends. If a significant trend is identified that reflects changes in background conditions, the trend data shall be used to update concentration limits. Otherwise concentration limits shall be developed only from prior historical data. Tolerance limits shall take into account seasonality.

3. Monitoring Points (Section 20405)

The monitoring points for groundwater monitoring shall be as listed in Table E.3A herein.

4. Point of Compliance (Section 20405)

The point of compliance (POC) for the water standard is a vertical surface located at the hydraulically down gradient limit of the Unit that extends through the uppermost aquifer underlying the Unit. The POC wells for the unit shall be MWs-1 and 5.

5. Compliance Period (Section 20410)

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

D. LEACHATE MONITORING

The Discharger shall monitor the landfill for leachate seeps **monthly** during the wet season and **quarterly** during the dry season as part of standard observations. Any leachate seeps observed during these inspections or at any other time shall be sampled and analyzed for the constituents of concern referenced in Table C herein. Reporting shall be conducted in accordance with Reporting Requirement F.10 of the WDRs.

E. GROUNDWATER MONITORING

1. Groundwater Elevation Monitoring (Section 20415(e)(13))

The groundwater surface elevation (in feet and hundredths, MSL) in all wells and piezometers shall be measured on a **quarterly** basis. Groundwater elevations taken prior to purging the well and sampling for Monitoring Parameters may be used to fulfill this requirement. Groundwater elevations for all upgradient and down gradient wells for a given groundwater body shall be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater gradient and direction. The results of groundwater elevation monitoring shall be displayed on a water table contour map and/or groundwater flow net for the site and included in each monitoring report. The Discharger shall use the groundwater elevation monitoring data to determine the following:

- A. The groundwater flow velocity
- B. The gradient direction in the upper aquifer, and in any additional zone of saturation monitored pursuant to this MRP
- C. Times of highest and lowest elevations of the water levels in the wells
- D. Separation of groundwater from the lowest point of the unit

The results of these determinations shall be included in the semi-annual reports.

2. Background Monitoring (Section 20415(b)(1)(A))

The Discharger shall install and operate a sufficient number of Background Monitoring Points at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water that has not been affected by a release from the units per Section 20415(b)(1)(A) of Title 27.

- A. Monitoring Points: MWs-3, 4 and any future wells installed upgradient of the landfill for background monitoring.
- B. Monitoring Schedule: As specified in Table E.3B.

Background monitoring data analysis shall include developing/updating concentration limits for statistical monitoring parameters and COCs, as necessary.

3. Corrective Action Monitoring (Sections 20425 and 20430)

The Discharger shall install and operate a groundwater corrective action monitoring system for the purpose of monitoring the nature and extent of the release and the progress of corrective action. A sufficient number of samples shall be taken from all Monitoring Points and Background Monitoring Points to satisfy the data analysis requirements for a given Reporting Period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Collection and analysis of samples shall be in accordance with procedures set forth in the Sample Collection and Analysis Plan per Monitoring Specification E.5 of the WDRs.

- A. Monitoring Points: MWs-1, 2, 5

The corrective action monitoring locations shall include any future wells installed along the point of compliance, down gradient, and/or side gradient of the unit to monitor the nature and extent of the release and/or progress of corrective action.

B. Monitoring Schedule

Groundwater samples shall be collected and analyzed in accordance with the following schedule:

Table E.3B
Corrective Action Monitoring Schedule

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Monitoring Approach</u>	
			<u>Nature/Extent</u>	<u>Trends</u>
Field Parameters				
Elevation	Feet MSL	Quarterly	---	---
Specific Conductance	µMhos/cm	Semiannually	---	---
pH	pH units	Semiannually	---	---
Temperature	°C	Semiannually	---	---
Turbidity	NTU	Semiannually	---	---
Monitoring Parameters (Attachment C)				
General Minerals:				
TDS	mg/L	Semiannually	Interwell	Intrawell
Chloride	mg/L	Semiannually		
Sulfate	mg/L	Semiannually		
Total Alkalinity	meq/L	Semiannually	Interwell	Intrawell
Total Hardness	mg/L	Semiannually	Interwell	Intrawell
Major Anions	mg/L	Annually	Interwell	Intrawell
Major Cations	mg/L	Annually	Interwell	Intrawell
Dissolved Inorganics	µg/L	Every 2 years		
VOCs	µg/L	Every 2 years	Intrawell	Intrawell
Constituents of Concern (Attachment D)				

Five-year COC monitoring under this Order shall be conducted by 15 November 2005 and at least every five years thereafter.

C. Monitoring Data Analysis

Monitoring data analysis shall include the following:

- a. Background Data
 - Updating concentration limits for statistical monitoring parameters and COCs, as necessary.

- b. Nature and Extent of Release
 - Comparisons with concentration limit to identify any new or previously undetected constituents at a monitoring point
 - Water chemistry analysis by appropriate methods (i.e. ion balance, Piper diagram, Stiff diagram etc.).
 - Preparation of contaminant contour maps for representative constituents of the release.
- c. Effectiveness of Corrective Action
 - Preparation of time series plots for representative constituents
 - Trend analysis for each constituent using appropriate statistical and graphical methods (e.g., Mann-Kendall).
 - Comparison of contaminant contour maps for representative constituents of the release showing historical changes in plume size and concentrations.

The results of the above analysis, including a narrative discussion, shall be included in each semiannual report and summarized in the Annual Report, as specified under Reporting B.2, above. The semiannual monitoring report shall also include a discussion of the progress of corrective action toward returning to compliance with the Water Quality Protection Standard, as specified in Section 20430(h) of Title 27.

F. FACILITY MONITORING

1. Standard Observations

Standard Observations shall be performed **monthly** during the wet season (October 1 to April 30) and **quarterly** during the dry season (May 1 to September 30) and shall include those elements identified in Reporting Requirement F.5.f of the WDRs. Each monitoring report shall include a summary and certification of completion of all Standard Observations. Field logs of standard observations shall also be included in the report.

2. Regular Maintenance Inspections

Landfill facilities (i.e. monitoring wells) shall be inspected **quarterly** to identify the need for maintenance and repairs. Necessary repairs shall be completed within 30 days of each inspection. Field logs of these inspections and documentation of the repairs shall be included in each semiannual monitoring report.

3. After Storm Events

Within seven days following each significant storm event (i.e. one which produces 2.0 inches or more of precipitation within a 24-hour period, as measured at the Rio Vista Station), the Discharger shall inspect the landfill cover and precipitation and drainage facilities for damage. Areas of erosion or sedimentation observed during the inspection(s) shall be flagged and repaired within seven days of identification. If repairs cannot be completed within the seven-day time frame, the Discharger shall notify the Regional Board of such and provide a schedule for completing necessary repairs. Findings and repairs implemented as a result of these inspections shall be included in each semiannual

monitoring report. If no inspection was conducted because there was no significant storm event during the semiannual period, the report shall state such fact.

4. Site Winterization

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility for the purpose of winterizing the site. The inspection shall identify any damage to the landfill cover, grade, precipitation and drainage controls, access roads and other landfill facilities. Any necessary construction, maintenance, or repairs to these facilities shall be completed by **31 October**. The Discharger shall document the results of the winterization inspection and any repair measures implemented in the Annual Report due by **31 January** of each year.

Documentation of the results of the above inspections and any repairs implemented shall include field observations, the location of any damage observed (i.e. on a site map), photographs of the damage, and a description of any repairs implemented, including post-repair photographs.

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

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

5 August 2005
(Date)

Attachments
JDM:8/5/2005

INFORMATION SHEET{PRIVATE }

ORDER NO. R5-2005-0117
CITY OF RIO VISTA
RIO VISTA LANDFILL
SOLANO COUNTY

The 20-acre site is on Airport Road approximately one mile north of Rio Vista. The site includes the 12-acre landfill, associated access roads, monitoring wells, drainage facilities, and two storm water collection ponds

Historical Operations

The landfill operated from the mid-1940s through 1992 accepting primarily household waste. Approximately 4,000 tons of waste per year was discharged to the landfill. The north and west areas of the landfill were filled first by excavating and filling shallow pits. After filling a pit, waste continued to be discharged to about 10 feet above surrounding grade and was then covered with soil obtained from excavating the next pit. The southern and northeastern portions of the site were subsequently filled by the area fill method. Cover soil was obtained from borrow areas which are now the storm water ponds at the site.

Groundwater

Since the direction of groundwater flow would be westerly if it were dominated by the Sacramento River, the northerly gradient direction appears to be the product of influences, including the Sacramento River to the south, Sacramento-San Joaquin Delta to the northwest, and hills to the south. Groundwater elevations at the site have historically ranged from about 0 to 2.8 feet MSL with an average seasonal variation of about +/- 0.75 feet.

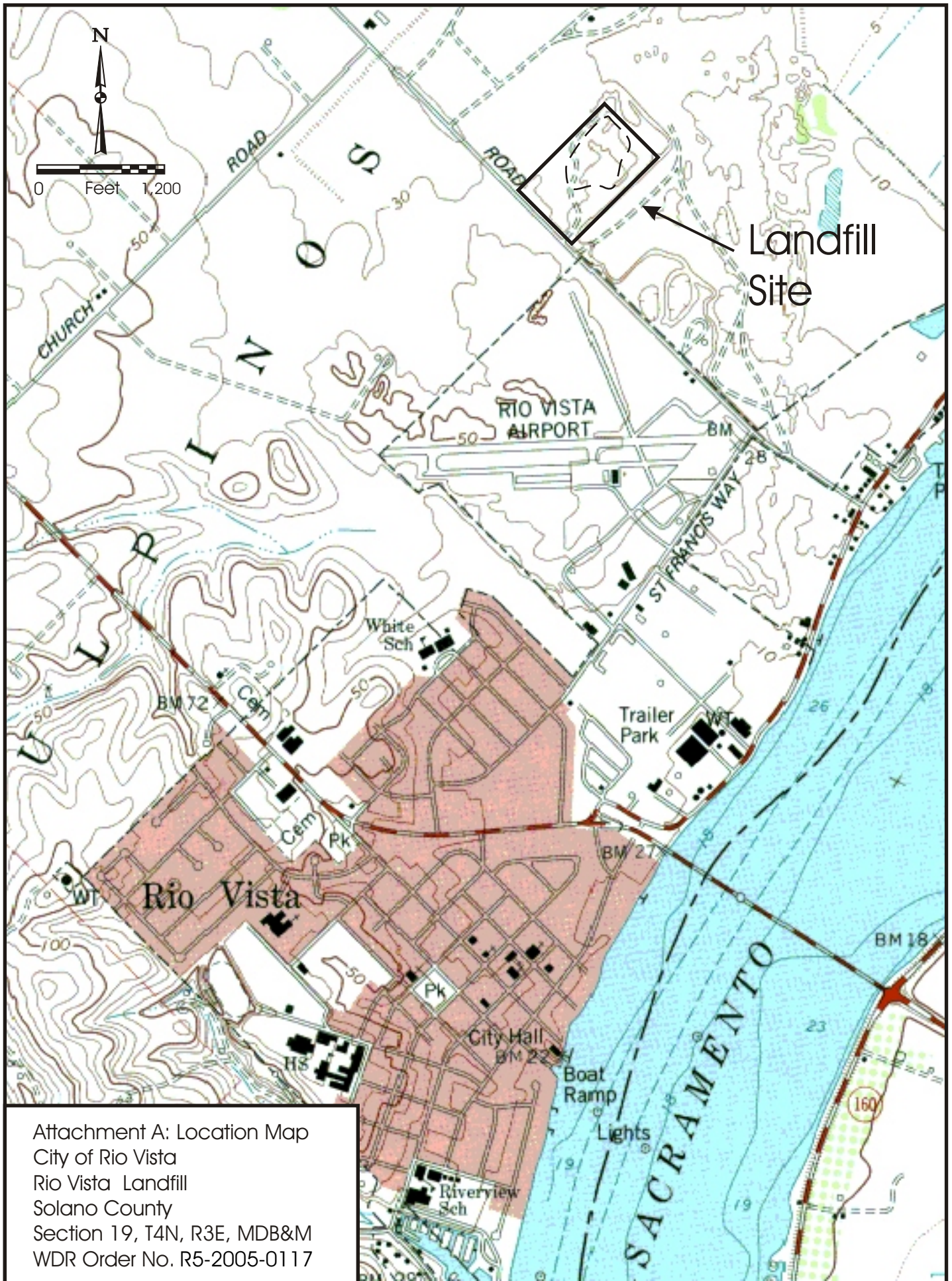
Current groundwater impacts at the site include total dissolved solids (TDS), chloride, sulfate and alkalinity. In March 2005, for example, TDS was detected at 1,200 mg/L in MW-5 down gradient of the landfill, compared to 870 mg/L in upgradient well MW-3 and 620 mg/L in upgradient MW-4. The average TDS concentration in both background wells combined is about 800 mg/L. The secondary drinking water standard for TDS is 500 mg/L. No volatile organic compounds have been detected at the site in recent years, although low to trace concentrations of dichlorodifluoromethane (Freon 12) have been previously sporadically detected at the site.

Landfill Cover

Although constructed in 2001, the landfill cover was not approved as complete until 2002 due to the need for repair of significant erosion damage that occurred during the 2001-2002 wet season. The cover was required under Title 27 regulations and was also viewed as a corrective action measure to help prevent further impacts to groundwater by reducing storm water infiltration into wastes.

Drainage

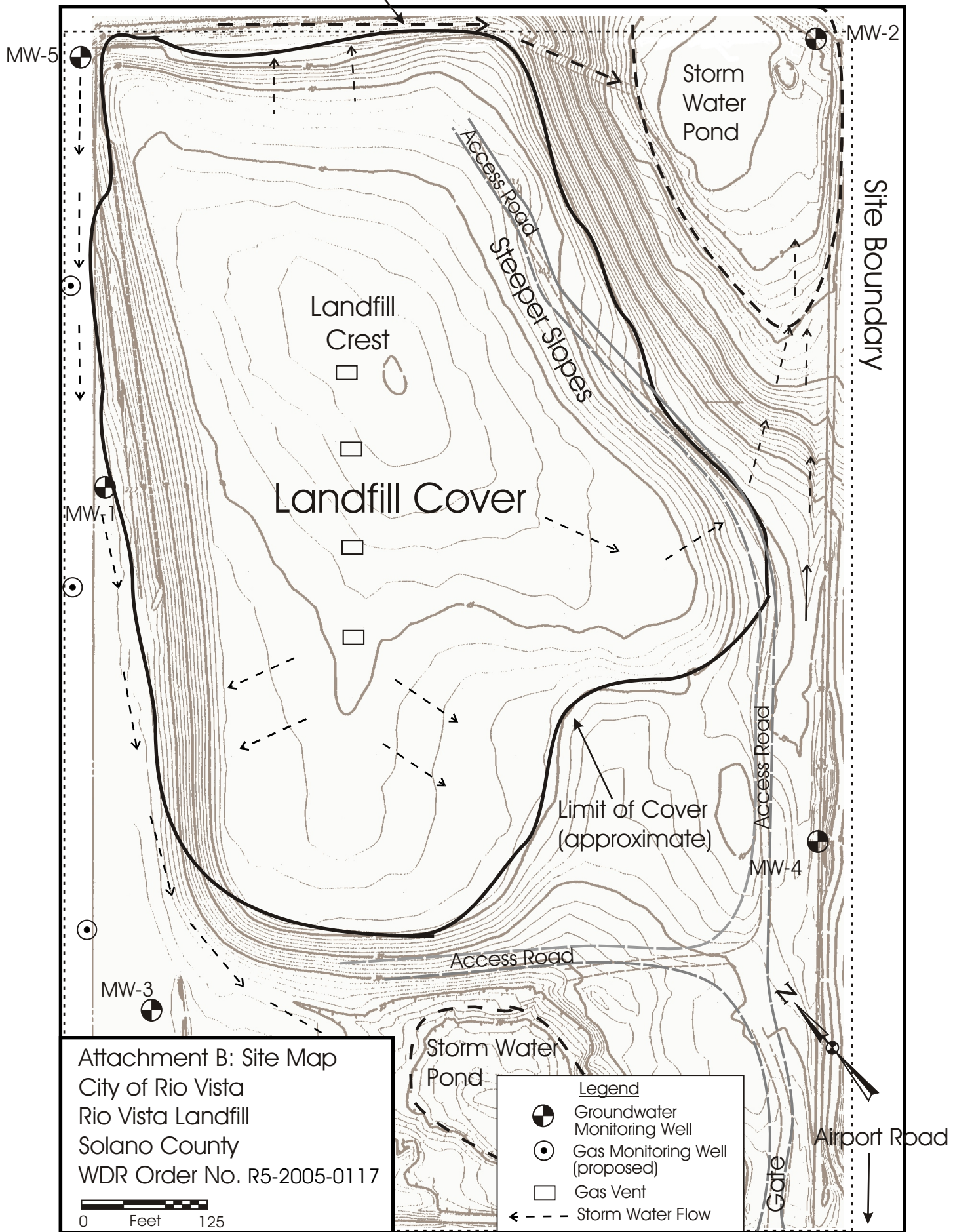
Surface drainage in the site area is toward the Sacramento River.



Landfill Site

Attachment A: Location Map
City of Rio Vista
Rio Vista Landfill
Solano County
Section 19, T4N, R3E, MDB&M
WDR Order No. R5-2005-0117

Exterior Bench/Drain



Attachment B: Site Map
 City of Rio Vista
 Rio Vista Landfill
 Solano County
 WDR Order No. R5-2005-0117

0 Feet 125

- Legend
- ⊕ Groundwater Monitoring Well
 - ⊙ Gas Monitoring Well (proposed)
 - Gas Vent
 - ← - - - Storm Water Flow

ATTACHMENT C

MONITORING PARAMETERS & APPROVED USEPA ANALYTICAL METHODS

Field Parameters	USEPA Test Method
Groundwater Elevation	----
pH	----
Specific conductance	----
Temperature	----
Turbidity	----

General Minerals	USEPA Test Method
Total Dissolved Solids (TDS)	2540C
Total Alkalinity	2310B
Total Hardness	2340B

<u>Major Anions</u>	
Bicarbonate	2310B
Chloride	300 (anion scan)
Nitrate – Nitrogen	300 (anion scan)
Sulfates	300 (anion scan)

<u>Major Cations</u>	
Calcium	200.7 (trace method)
Magnesium	200.7 (trace method)
Potassium	200.7 (trace method)
Sodium	200.7 (trace method)

Dissolved Inorganics¹	USEPA Test Method
Aluminum	200.7/6010
Antimony	200.7/6010
Arsenic	200.9/200.8
Barium	200.7/6010
Beryllium	200.7/6010
Cadmium	200.7/6010
Chromium	200.7/6010
Hexavalent Chromium	7199/1636
Cobalt	200.7/6010
Copper	200.7/6010
Cyanide	335.4/9010
Iron	200.7/6010
Lead	200.9/200.8
Manganese	200.7/6010
Mercury	7470A
Molybdenum	200.7/6010
Nickel	200.9/200.8

ATTACHMENT C (CON'T)

Selenium	200.9/200.8
Silver	200.7/6010
Sulfide	9030
Thallium	200.7/6010
Tin	200.7/6010
Vanadium	200.7/6010
Zinc	200.7/6010

Volatile Organic Compounds² (VOCs, by USEPA Method 8260B):

Acetone
Acetonitrile
Acrolein
Acrylonitrile
Allyl chloride (3-Chloropropene)
Tert-Amyl methyl ether
Benzene
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Tert-Butyl alcohol
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
tert-Butyl ethyl ether
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC-12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)

ATTACHMENT C (CON'T)

1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane
2,2-Dichloropropene
1,1-Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Iodomethane (Methyl iodide)
Isobutyl alcohol
di-Isopropyl ether
Methacrylonitrile
Methyl bromide (Bromomethene)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK: 2-Butanone)
4-Methyl-2-pentanone (Methyl isobutylketone)
Methyl tert-butyl ether (MtBE)
Naphthalene
2-Nitropropane
n-Propylbenzene
Propionitrile
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene

ATTACHMENT C (CON'T)

1,3,5-Trimethylbenzene
Vinyl chloride
Xylenes (total)

-
1. Samples shall be filtered prior to performing dissolved inorganics analysis.
 2. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte per WDR Monitoring Specification E.13.

ATTACHMENT D

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Field Parameters	USEPA Test Method
Groundwater Elevation	----
pH	----
Specific conductance	----
Temperature	----
Turbidity	----

General Minerals	USEPA Test Method
Total Dissolved Solids (TDS)	2540C
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Sodium	200.7 (trace method)

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Copper	200.7/6010
Cyanide	335.4/9010
Iron	200.7/6010
Lead	200.9/200.8
Manganese	200.7/6010
Mercury	7470A
Molybdenum	200.7/6010
Nickel	200.9/200.8

ATTACHMENT D (CON'T)

Selenium	200.9/200.8
Silver	200.7/6010
Sulfide	9030
Thallium	200.7/6010
Tin	200.7/6010
Vanadium	200.7/6010
Zinc	200.7/6010

Volatile Organic Compounds² (VOCs, by USEPA Method 8260B):

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Acrylonitrile
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Benzene
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Tert-Butyl alcohol
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
tert-Butyl ethyl ether
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
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m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC-12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane

ATTACHMENT D (CON'T)

2,2-Dichloropropene
1,1-Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Iodomethane (Methyl iodide)
Isobutyl alcohol
di-Isopropyl ether
Methacrylonitrile
Methyl bromide (Bromomethene)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK: 2-Butanone)
4-Methyl-2-pentanone (Methyl isobutylketone)
Methyl tert-butyl ether (MtBE)
Naphthalene
2-Nitropropane
n-Propylbenzene
Propionitrile
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl chloride
Xylenes (total)

Semivolatile Organic Compounds² (USEPA Method 8270 - base, neutral, & acid extractables):

Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
4-Aminobiphenyl
Anthracene

ATTACHMENT D (CON'T)

Benzo[a]anthracene (Benzanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
Bis(2-ethylhexyl) phthalate
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methylethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)
4-Bromophenyl phenyl ether
Butyl benzyl phthalate (Benzyl butyl phthalate)
p-Chloroaniline
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene
o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-Dimethylphenol (m-Xylenol)
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
Diphenylamine
Ethyl methanesulfonate
Famphur
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachloropropene
Indeno(1,2,3-c,d)pyrene

ATTACHMENT D (CON'T)

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

ATTACHMENT D (CON'T)

Organochlorine Pesticides² (USEPA Method 8081A)

Aldrin
 α -BHC
 β -BHC
 γ -BHC (Lindane)
 δ -BHC
Chlorobenzilate
 α -Chlordane
 γ -Chlordane
Chlordane – not otherwise specified
DBCP
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dieldrin
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Endrin ketone
Heptachlor
Heptachlor epoxide
Hexachlorocyclopentadiene
Isodrin
Methoxychlor
Toxaphene

Polychlorinated Biphenols² (PCBs, USEPA Method 8082)

Aroclor 1016
Aroclor 1221
Aroclor 1232
Aroclor 1242
Aroclor 1248
Aroclor 1254
Aroclor 1260

Organophosphorus Pesticides² (USEPA Method 8141A):

Chlorpyrifos
Diazinon
Dimethoate
Disulfoton
Ethion
Famphur
Malathion
Parathion

ATTACHMENT D (CON'T)

Parathion-ethyl
Parathion-methyl
Phorate

Chlorinated Herbicides² (USEPA Method 8151A):

2,4-D (2,4-Dichlorophenoxyacetic acid)
Dicamba
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
MCPA
MCPP
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)
Pentachlorophenol

-
1. Samples shall be filtered prior to performing dissolved inorganics analysis.
 2. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte per WDR Monitoring Specification E.13.