

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2002-0142

WASTE DISCHARGE REQUIREMENTS
FOR
*UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT
AND THE COUNTY OF TUOLUMNE DEPARTMENT OF PUBLIC WORKS*
FOR
CLOSURE
BIG OAK FLAT (GROVELAND) MUNICIPAL SOLID WASTE LANDFILL FACILITY
TUOLUMNE COUNTY

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

1. The County of Tuolumne operates and manages, and the United States Bureau of Land Management (BLM) owns a municipal solid waste landfill about two miles south of the unincorporated town of Groveland, in Section 33, T1S, R16E, MDB&M, as shown in Attachment A, which is incorporated herein and made part of this Order. The County of Tuolumne and the BLM is hereafter collectively referred to as the Discharger.
2. The 10-acre facility consists of one existing unlined waste management unit (Unit) covering five acres as shown in Attachment B, which is incorporated herein and made part of this Order. The facility is comprised of Assessor's Parcel Numbers (APN) 066-181-47.
3. This is an existing landfill unit, which initiated operation in 1965. The facility began operating as a burn dump in 1967. Burning ceased in 1975 and the facility was operated as a "canyon fill" landfill. By the end of 2000, the total waste volume was estimated to be 124,863 cubic yards. The facility ceased accepting waste in May 2001.
4. The landfill was under the administrative jurisdiction of the County Road Department prior to 1980, when this responsibility was transferred to the County Division of Environmental Health. The site lease with the BLM expired in 1992 and was granted an extension pending acquisition of the property by the County under a federal program established in 1992. The administrative responsibility for the landfill has now been transferred to the County's Department of Public Works.
5. On 31 October 1995, the Board issued Order No. 95-247, in which the facility was classified as a Class III waste disposal site for the discharge of non-hazardous solid or inert wastes in accordance with the regulations in effect when the order was issued. These wastes may have included friable asbestos, a hazardous waste under Title 22 of the California Code of Regulations (CCR), but considered an inert waste that does not pose a threat to groundwater quality. Section 25143.7 of the Health and Safety Code permits the disposal of friable asbestos with the appropriate permit and provided the wastes are handled and disposed of in

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accordance with other applicable State and Federal statutes and regulations. This Order classifies the Unit as a Class III solid waste landfill in accordance with Title 27, CCR, §20005, et seq. (Title 27). Adoption of this Order rescinded Order No. 95-247.

SITE DESCRIPTION

6. The measured hydraulic conductivity of the native soils underlying the Unit is unknown.
7. The location of the nearest Holocene fault has not been previously reported by the Discharger.
8. Land uses within 1,000 feet of the facility is zoned as Agricultural or Residential Estate (5-acre minimum), however, there are no structures within 1,000 feet of the facility. The area near the landfill is currently undeveloped and rural in nature.
9. The landfill is at the upper end of a ravine, near the apex of a knoll at an elevation of approximately 3,300 feet. The landfill is in an area of steep topography characterized by rock outcroppings. Pine and manzanita vegetation dominate the landscape.
10. The underlying geology is slate (metamorphic rocks) of the Calaveras Formation. The underlying formation lacks fine-grained material and the slate outcroppings appear to have the potential for high permeability. The underlying rock is "rippable". Oxidized (weathered) rock is reported to depths of 10-30 feet. This zone of oxidation is considered more permeable than the underlying bedrock and could give rise to local perched groundwater conditions. In general, the hydrologic regime at the facility is a hard rock, fracture-dominated, with water flowing along fractures or veins.
11. The facility receives an average of 36 inches of precipitation per year as measured at the city of Groveland between 1920-1986. The mean evaporation is 64 inches per year as measured at the Don Pedro Reservoir (19 year average) about 7 miles southwest of the site.
12. The 100-year, 24-hour precipitation event is estimated to be 6.9 inches, based on Department of Water Resources' bulletin entitled *Rainfall Depth-Duration-Frequency for California*, revised November 1982, updated August 1986, and the Groveland 2 Weather Station.
13. The waste management facility is not within a 100-year flood plain.
14. There are 14 municipal, domestic, industrial, or agricultural groundwater supply wells within one mile of the site. (EBA Wastechologies, Water Quality Solid Waste Assessment Test Report, September 1991). However, the majority of domestic water is supplied by the Groveland Community Services District, which derives its water source from the underground Hetch Hetchy Mountain Tunnel. The Hetch Hetchy aqueduct is approximately 1,000 feet north of the facility. At least two intermittent surface springs have been observed within 1,000 feet of the facility.

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WASTE AND SITE CLASSIFICATION

15. The Discharger discharged municipal solid wastes, which are defined in §20164 of Title 27.

SURFACE AND GROUND WATER CONDITIONS

16. The Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin, Fourth Edition (hereafter Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
17. Seasonal surface water runoff from the landfill is to an unnamed tributary that drains southerly to Little Jackass Creek. Little Jackass Creek flows into Big Jackass Creek, which then drains into Moccasin. Moccasin Creek merges with the Tuolumne River at the New Don Pedro Reservoir.
18. The landfill is within the western side of the Sierra Nevada Range. The designated beneficial uses of the Don Pedro Reservoir (and by the inference of its tributary streams, including Little Jackass Creek, Big Jackass Creek, and Moccasin Creek), as specified in the Basin Plan, are municipal and domestic supply, industrial power supply, water contact and non-contact recreation, warm and cold fresh water habitat, and wildlife habitat.
19. The first encountered groundwater averages 26 feet below the ground surface (bgs) at GMW-2, 73 feet bgs at GMW-3 and 78 feet bgs at GMW-1. Groundwater elevations range from 3175 feet MSL to 3235 feet MSL.
20. Monitoring data indicates background groundwater quality has an electrical conductivity (EC) ranging from 200 and 500 micro ohms/cm, with total dissolved solids (TDS) ranging between 120 and 320 mg/l.
21. The direction of groundwater flow is toward the southwest. The average groundwater gradient is approximately 0.06 feet per foot. The average groundwater velocity has not yet been determined by the Discharger.
22. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are domestic and municipal, agricultural, industrial service supply and industrial process supply.

SURFACE WATER MONITORING

23. Surface water runoff after storm events is sampled at three locations downslope from the landfill. Surface water sample location GCL-1 is within the Groveland Landfill Creek. Locations LJC-1 and LJC-2 are within Little Jackass Creek approximately $\frac{3}{4}$ miles south of the landfill. Location LJC-1 is upstream of the confluence with Groveland Landfill Creek, whereas location of LJC-2 is downstream of the confluence.

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VADOSE ZONE MONITORING

24. There is no vadose zone monitoring associated with the landfill. The landfill is unlined and it is not practical to perform this type of monitoring. The Board granted exemption to vadose zone monitoring on 2 October 1989.

GROUNDWATER MONITORING

25. Three groundwater monitoring wells are part of the detection monitoring system. The upgradient monitoring well GMW-1A is north-northeast of the landfill. The well was completed in January 2000 as a replacement for GMW-1. Monitoring well GMW-2 south of the landfill is along strike of the fractures within the slate bedrock. Well GMW-3 was also installed in July 1990 and is located downslope to the west of the landfill within the slate. Additionally, the Discharger has established a sampling point at a spring discharge, Spring GS-1. GS-1 is located approximately 300 feet west of the landfill's sediment pond.
26. The Discharger's detection monitoring program for groundwater at this Unit does satisfy the requirements contained in Title 27.
27. Volatile organic compounds (VOCs) are often detected in a release from a landfill, and are the primary waste constituents detected in groundwater beneath a municipal solid waste landfill (see Finding Nos. 32 and 33). Since volatile organic compounds are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a Unit.
28. Sections 20415(e)(8) and (9) of Title 27 provide for the non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a Unit in accordance with §20415(b)(1)(B)2.-4. of Title 27. However, Title 27 does not specify a specific method for non-statistical evaluation of monitoring data.
29. The Board may specify a non-statistical data analysis method pursuant to Section 20080(a)(1) of Title 27. Section 13360(a)(1) of the California Water Code allows the Board to specify requirements to protect underground or surface waters from leakage from a solid waste site, which includes a method to provide the best assurance of determining the earliest possible detection of a release.
30. In order to provide the best assurance of the earliest possible detection of a release of non-naturally occurring waste constituents from a Unit, this Order specifies a non-statistical method for the evaluation of monitoring data.
31. The specified non-statistical method for evaluation of monitoring data provides two criteria (or triggers) for making the determination that there has been a release of non-naturally occurring waste constituents from a Unit. The presence of two non-naturally occurring waste constituents above their respective method detection limit (MDL), or one non-naturally

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

GROUNDWATER DEGRADATION

32. Monitoring at Groveland Landfill includes inorganic parameters and Volatile Organic Compounds (VOCs). The Discharger reports that no inorganic constituent has exceeded the tolerance limits to date in monitoring wells GMW-2, GMW-3, GS-1, as reported in *Detection Monitoring Report and Annual Compliance Evaluation Summary – Fourth Quarter 2001*. The only known seepage of leachate occurred and was sampled by the Board on 26 February 1992.
33. VOCs have been detected in GMW-2 since 1991 and at GMW-3 since 1990. Organic compounds historically detected at GMW-2 include mainly 1,1-dichloroethane (DCA), with other VOCs being detected in trace amounts. Compounds detected in GMW-3 are mainly DCA and dichlorodifluoromethane (Freon 12). Trace amounts of carbon disulfide were detected in GMW-1A in late 2000 and early 2001 sampling, carbon disulfide has not been detected since July 2001. VOCs have previously been detected in the spring sample location GS-1.

CONSTRUCTION AND ENGINEERED ALTERNATIVE

34. On 17 June 1993, the State Water Resources Control Board adopted Resolution No. 93-62 implementing a State Policy for the construction, monitoring, and operation of municipal solid waste landfills that is consistent with the federal municipal solid waste regulations promulgated under Title 40, Code of Federal Regulations, Part 258 (Subtitle D).
35. Section 20080(b) of Title 27 allows the Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in accordance with §20080(c)(1) and (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in §20080(b), or would be impractical and would not promote attainment of applicable performance standards. The Discharger must also demonstrate that the proposed engineered alternative cover system is consistent with the performance goal addressed by the particular prescriptive standard, and provides

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protection against water quality impairment equivalent to the prescriptive standard in accordance with §20080(b)(2) of Title 27.

36. Section 13360(a)(1) of the California Water Code allows the Board to specify the design, type of construction, and/or particular manner in which compliance must be met in waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.
37. Title 27 §21090(a)(1) through §21090(a)(3)(2) outlines a prescriptive standard for the required components of the final landfill cover. These components consist of, in ascending order:
 - a. a foundation layer, consisting of no less than two-feet of appropriate materials as described in Title 27 §21090(a)(1);
 - b. a low-hydraulic-conductivity layer consisting of not less than one-foot of clean soil, compacted to achieve a hydraulic conductivity of either 1×10^{-6} cm/sec (i.e., 1 ft/yr) or less;
 - c. an erosion-resistant layer, either consisting of not less than one-foot of clean soil, capable of sustaining native or suitable plant growth or a mechanically erosion-resistant layer that is erosion and ultraviolet-light resistant that resists erosion due to wind scour, raindrop impact, and runoff.
38. The Discharger submitted a Final Closure and Post-Closure Maintenance Plan (Revision 2, October 2001) requesting approval of an engineered alternative to the cover requirements. The engineered alternative is incorporating the use of 60-mil low linear density polyethylene (LLDPE) in the final cover section. The proposed final cover section will consist of, in ascending order:
 - a. a minimum of two-feet thick foundation layer comprised of on-site soils (prescriptive per Title 27, CCR §21090(a)(1));
 - b. a 60-mil thick textured (on both sides) LLDPE geomembrane barrier layer, overlain with a cushion of non-woven geotextile, and a composite of LLDPE geonet/non-woven geotextile drainage strips (proposed engineered alternative per Title 27, CCR §20080(b));
 - c. and a minimum of one-foot thick vegetative soil layer comprised of on-site soils (prescriptive per Title 27, CCR §21090(a)(A)(1)).
39. The Discharger adequately demonstrated that construction of a Subtitle D and a Title 27 prescriptive standard cover would be unreasonable and unnecessarily burdensome when compared to the proposed engineered alternative design. There is no clay source on-site or nearby and the cost of importing clay from off-site or mixing on-site soils with bentonite would cost substantially more than the alternative design. The Discharger has demonstrated

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that the proposed engineered alternative is consistent with the performance goals of the prescriptive standard and affords equivalent protection against water quality impairment.

40. The landfill is an existing unlined site where vadose zone monitoring is not practical, and a waiver of vadose zone monitoring is not against the public interest.
41. Closure construction will proceed only after all applicable construction quality assurance plans have been approved by Executive Officer.

CEQA AND OTHER CONSIDERATIONS

42. The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resource Code §21000, et seq., and the CEQA guidelines, in accordance with Title 14, CCR, §15301.
43. This order implements:
 - a. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition – 1998 (Basin Plan);
 - b. The prescriptive standards and performance goals of Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions;
 - c. The prescriptive standards and performance criteria of RCRA Subtitle D, Part 258; and
 - d. State Water Resources Control Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993.

PROCEDURAL REQUIREMENTS

44. 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.
45. The 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.
46. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.
47. Any person adversely affected by this action of the Board may petition the State Water Resources Control Board to review the action. The petition must be received by the State

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Board within 30 days of the date of issuance of this Order. Copies of the law and regulations applicable to filing the petition will be provided on request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order No. 95-247 is rescinded, and that the County of Tuolumne and the U.S. Department of the Interior Bureau of Land Management, its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of 'hazardous waste' or 'designated waste' is prohibited. For the purposes of this Order, the term 'hazardous waste' is as defined in Title 23, California Code of Regulations, Section 2510 et seq., and 'designated waste' is as defined in Title 27.
2. The discharge of wastes outside of a Unit or portions of a Unit specifically designed for their containment is prohibited.
3. The discharge of waste to a closed Unit is prohibited.
4. The discharge shall not cause the release of pollutants, or waste constituents in a manner which could cause a condition of nuisance, degradation, contamination, or pollution of groundwater to occur, as indicated by the most appropriate statistical or non-statistical data analysis method and retest method listed in this Order, the Monitoring and Reporting Program, or the Standard Provisions and Reporting Requirements.
5. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.
6. The discharge 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. FACILITY SPECIFICATIONS

1. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.
2. The Discharger shall immediately notify the Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions, which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.

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3. Water used for facility maintenance shall be limited to the minimum amount necessary for dust control, and construction.
4. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.
5. 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.
6. Surface drainage within the waste management facility shall either be contained on-site or be discharged in accordance with applicable storm water regulations.
7. The Discharger shall maintain a *Storm Water Pollution Prevention Plan and Monitoring Program and Reporting Requirements* in accordance with State Water Resources Control Board Order No. 97-03-DWQ, or retain all storm water on-site.

C. CONSTRUCTION SPECIFICATIONS

1. The Discharger shall submit for Executive Officer review and approval **prior to** construction, design plans and specifications for closure of the Unit, that include the following:
 - a. A Construction Quality Assurance Plan meeting the requirements of §20324 of Title 27; and
 - b. A geotechnical evaluation of the area soils, evaluating their use as the cover layer.
2. Construction shall proceed only after all applicable construction quality assurance plans have been approved by Executive Officer.
3. Following the completion of construction of a Unit or portion of a Unit, the final documentation required in §20324(d)(1)(C) of Title 27 shall be submitted to the Executive Officer for review and approval. The report shall be certified by a registered civil engineer or a certified engineering geologist. It shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, and with the prescriptive standards and performance goals of Title 27.
4. A third party independent of both the Discharger and the construction contractor shall perform all of the construction quality assurance monitoring and testing during the construction of a liner system.
5. Closure shall not proceed in the absence of closure waste discharge requirements.

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D. DETECTION MONITORING SPECIFICATIONS

1. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater and surface water, and in accordance with Monitoring and Reporting Program No. R5-2002-0142. The Discharger shall provide Board staff a minimum of one week notification prior to commencing any field activities related to the installation, repair, or abandonment of monitoring devices, and a minimum 48 hour notification prior to the collection of samples associated with a detection monitoring program, evaluation monitoring program, or corrective action program.
2. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, Monitoring and Reporting Program No. R5-2002-0142, and the Standard Provisions and Reporting Requirements, dated April 2000.
6. The Water Quality Protection Standard for organic compounds which are not naturally occurring and not detected in background groundwater samples shall be taken as the detection limit of the analytical method used (i.e., US-EPA methods 8260 and 8270). The presence of non-naturally occurring organic compounds in samples above the Water Quality Protection Standard from detection monitoring wells is evidence of a release from the Unit.
7. The concentrations of the constituents of concern in waters passing the Point of Compliance shall not exceed the concentration limits established pursuant to Monitoring and Reporting Program No. R5-2002-0142.
8. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in Monitoring and Reporting Program No. R5-2002-0142 and §20415(e) of Title 27.
9. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless the Executive Officer approves a longer time period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible.
10. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) *Methods for the Analysis of Organics in Water and Wastewater* (USEPA 600 Series), (2) *Test Methods for Evaluating Solid Waste* (SW-846, latest edition), and (3) *Methods for Chemical Analysis of Water and Wastes* (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan.

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11. 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.
12. 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.
13. **“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.
14. **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.
15. 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.
16. 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.

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17. 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.
18. 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 §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 §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 downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or nonstatistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties".
19. The Discharger may propose an alternate statistical method [to the methods listed under 27 CCR §20415(e)(8)(A-D)] in accordance with §20415(e)(8)(E) of Title 27, for review and approval by the Executive Officer. Upon receiving written approval from the Executive Officer, alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate). Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Board staff.
20. The Discharger shall use the following nonstatistical method for the VOC_{water} and VOC_{spg} (Soil Pore Gas) Monitoring Parameters and for all Constituents of Concern which are not amenable to the statistical tests above (i.e., less than 10% of the data from background samples that equal or exceed their respective MDL). Each qualifying constituent at a monitoring point shall be determined based on either:
 - a. The data from a single sample for that constituent, taken during that reporting period from that monitoring point; or
 - b. The data from the sample which contains the largest number of qualifying constituents, where several independent samples have been analyzed for that constituent at a given monitoring point.

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

21. The method shall be implemented as follows:

- a. *For the Volatile Organic Compounds Monitoring Parameter For Water Samples [VOC_{water}]:* For any given monitoring point, the VOC_{water} Monitoring Parameter is a composite parameter addressing all “qualifying VOCs” (in this case, VOCs that are detected in less than 10% of background samples).

The Discharger shall conduct verification testing (see Detection Monitoring Specifications E.21. and E.23 below, as appropriate) to determine whether a release of VOC_{water} Monitoring Parameter has occurred if the data for any monitoring point meets either of the following triggering conditions:

- 1) The data contains two or more qualifying VOCs that equal or exceed their respective MDLs; or
- 2) The data contains one qualifying VOC that equals or exceeds its PQL.

- b. *For the Volatile Organic Compounds Monitoring Parameter For Soil Pore Gas Samples [VOC_{spg}]:* the VOC_{spg} Monitoring Parameter is a composite parameter for soil pore gas addressing all “qualifying VOCs” detectable using either GC or GC/MS analysis for at least a ten liter sample of soil pore gas (e.g., collected in a vacuum canister). It involves the same scope of VOCs as does the VOC_{water} Monitoring Parameter. For the VOC_{spg} test, “qualifying VOCs” consist of all those VOCs which are detectable in less than 10% of background soil pore gas samples.

The Discharger shall conduct verification testing (see Detection Monitoring Specifications E.21. and E.23 below, as appropriate) to determine whether a release of VOC_{spg} Monitoring Parameter has occurred if the data for any monitoring point meets either of the following triggering conditions:

- 1) The data contains two or more qualifying VOCs that equal or exceed their respective MDLs; or
- 2) The data contains one qualifying VOC that equals or exceeds its PQL.

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- c. *For Constituents of Concern:* For five-yearly testing of all Constituents of Concern (COCs), the “qualifying constituents” consist of COCs that are detected in less than 10% of applicable background samples.

The Discharger shall conduct verification testing (see Detection Monitoring Specifications E.21. and E.23 below, as appropriate) to determine whether a release of COCs has occurred if the data for any monitoring point meets either of the following triggering conditions:

- 1) The data contains two or more qualifying constituents that equal or exceed their respective MDLs; or
 - 2) The data contains one qualifying constituent that equals or exceeds its PQL.
22. **Non-Statistical Method Retest.** A non-statistical test method may be used by the Discharger to analyze the monitoring data for which it is impractical to conduct a statistical analysis. A non-statistical test method shall include a procedure to verify that there is “measurably significant” evidence of a release from the Unit. For the VOC_{water}, VOC_{spg}, and nonstatistical COC test, the Discharger shall use a discrete retest consisting of two new samples from each indicating monitoring point. The Discharger shall conduct the retest for the standard non-statistical method as follows:
- a. **For VOC_{water} and VOC_{spg}.** Because the VOC composite Monitoring Parameter (for water or soil pore gas) is a single parameter which addresses an entire family of constituents likely to be present in any landfill release, **the scope of the laboratory analysis for each of the two retest samples shall include all VOCs detectable in that retest sample.** Therefore, a confirming retest, in accordance with Detection Monitoring Specification E.20.a. and b., above, for either triggering condition in either of the two retest samples, shall have validated the original indication even if the detected constituents in the confirming retest sample(s) differs from those detected in the sample which initiated the retest.
 - b. **For Constituents of Concern.** Because all Constituents of Concern that are jointly addressed in the non-statistical test above, remain as individual Constituents of Concern, **the scope of the laboratory analysis for the non-statistical retest of Constituents of Concern shall address only those constituents detected in the sample which initiated the retest.** Therefore, the list of “qualifying constituents” for use in the retest, under Detection Monitoring Specification E.20.c., shall consist of those constituents which provided the original indication at that monitoring point. If the retest meets either triggering condition in either of the two retest samples, the retest shall have validated the original indication.

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23. Response to Detection in Background of VOCs (or any other constituent which is not naturally in the background and thus is not amenable to statistical analysis):

a. Any time the laboratory analysis of a sample from a background monitoring point, sampled for VOCs, shows either:

- 1) Two or more VOCs at or above their respective MDL; or
- 2) One VOC at or above its respective PQL.

Then the Discharger shall:

- a) **Immediately** notify the Board by phone;
 - b) Follow up with written notification by certified mail **within seven days**;
 - c) Obtain **two** new independent VOC samples from that background monitoring point; and
 - d) Send such samples for laboratory analysis of all detectable VOCs **within thirty days**.
- b. If either or both the new samples validates the presence of VOC(s), using the above criteria, the Discharger shall:
- 1) **Immediately** notify the Board about the VOC(s) verified to be present at that background monitoring point, and follow up with written notification submitted by certified mail **within seven days** of validation; and
 - 2) If the Discharger believes that the VOC(s) in background is from a source other than the Unit, then:
 - a) **Within seven days** of determining “measurably significant” evidence of a release, submit to the Board by certified mail a Notification of Intent to make such a demonstration pursuant to §20420(k)(7) of Title 27; and
 - b) **Within 90 days** of determining “measurably significant” evidence of a release, submit a report to the Board that demonstrates that a source other than the Unit caused the evidence, or that the evidence resulted from error in sampling, analysis or evaluation, or from natural variation in groundwater, surface water, or the unsaturated zone.

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- c. If the Executive Officer determines, after reviewing the submitted report(s), that the VOC(s) detected originated from a source other than the Unit(s), the Executive Officer will make appropriate changes to the monitoring program.

24. If the Executive Officer determines, after reviewing the submitted report, that the detected VOC(s) most likely originated from the Unit(s), the Discharger shall **immediately** implement the requirements of XI. Response To A Release, C. Release Has Been Verified, contained in the Standard Provisions and Reporting Requirements.

E. REPORTING REQUIREMENTS

1. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Board office by telephone **as soon as** it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.
2. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the 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.
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

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

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

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- f. A summary and certification of completion of all **Standard Observations** for the Unit(s), for the perimeter of the Unit, and for the receiving waters. The Standard Observations shall include:
- 1) For the Unit:
 - a) Evidence of ponded water at any point on the facility (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
 - 2) Along the perimeter of the Unit:
 - a) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
 - 3) For receiving waters:
 - a) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
 - b) Discoloration and turbidity - description of color, source, and size of affected area;
 - c) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
 - d) Evidence of water uses - presence of water-associated wildlife;
 - e) Flow rate; and
 - f) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.
- g. The quantity and types of wastes discharged and the locations in the Unit where waste has been placed since submittal of the last such report.

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5. The Discharger shall report by telephone any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the 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 Board; and
 - e. Corrective measures underway or proposed, and corresponding time schedule.
6. The Discharger shall submit an **Annual Monitoring Summary Report** to the 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 downgradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
 - b. Unless otherwise exempted by the Executive Officer, all monitoring analytical data obtained during the previous two, six-month reporting periods, shall be submitted in tabular form as well as in a digital file format acceptable to the Executive Officer. The 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 Board.
 - c. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
 - d. A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours.

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- e. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.
- f. An evaluation of the effectiveness of the leachate monitoring/control facilities.

F. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 and 40 Code of Federal Regulations Part 258 (Subtitle D) that are not specifically referred to in this Order.
3. The Discharger shall comply with Monitoring and Reporting Program No. R5-2002-0142, which is incorporated into and made part of this Order.
4. The Discharger shall comply with the applicable portions of the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Non-hazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258 et seq.), dated April 2000, which are hereby incorporated into this Order.
5. All reports and transmittal letters shall be signed by persons identified below:
 - a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor.
 - c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
 - d. A duly authorized representative of a person designated in a, b or c above if;
 - 1) The authorization is made in writing by a person described in a, b, or c of this provision;
 - 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

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- 3) The written authorization is submitted to the Board.
- e. Any person signing a document under this Section shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”
6. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.
7. The owner of the waste management facility shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and from gases and leachate generated by discharged waste during the active life, closure, and post-closure maintenance period of the Unit(s) and during subsequent use of the property for other purposes.
8. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger’s violations of the Order.
9. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the 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 Board, and a statement. The statement shall comply with the signatory requirements contained in Provision F.5. and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer of this Order shall be approved or disapproved by the Board.
10. The Discharger shall conduct an annual review of the financial assurance for initiating and completing corrective action, and submit a report for Executive Officer review and approval. The assurances of financial responsibility shall provide that funds for corrective action shall be available to the Regional Board upon the issuance of any order under California Water Code, Division 7, Chapter 5. The Discharger shall adjust the cost

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annually to account for inflation and any changes in facility design, construction, or operation.

11. The Discharger shall conduct an annual review of the financial assurance for closure and postclosure maintenance, and submit a report for Executive Officer review and approval. The assurances of financial responsibility shall provide that funds for closure and postclosure maintenance shall be available to the Regional Board upon the issuance of any order under California Water Code, Division 7, Chapter 5. The Discharger shall adjust the cost annually to account for inflation and any changes in facility design, construction, or operation.

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

| <u>Task</u> | <u>Compliance Date</u> |
|--|------------------------------|
| A. Construction Plans | |
| Submit construction and design plans for Executive Officer review and approval. (see Construction Specification D.1) | Prior to construction |
| B. Construction Report | |
| Submit a construction report upon completion demonstrating construction was in accordance with approved construction plans for Executive Officer review and approval. (see Construction Specification D.6) | Post Construction |
| C. Financial Assurance Review | |
| 1. Annual Review of Financial Assurance for initiating and completing corrective action (see Provision G.10.) | 30 April each year |
| 2. Annual Review of Financial Assurance for closure and post-closure maintenance (see Provision G.11.) | 30 April each year |

I, THOMAS R. PINKOS, Acting 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 19 July 2002.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0142

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THOMAS R. PINKOS,
Acting Executive Officer

CBH: 05/20/2002

INFORMATION SHEET

COUNTY OF TUOLUMNE AND UNITED STATES DEPARTMENT OF THE
INTERIOR BUREAU OF LAND MANAGEMENT
BIG OAK FLAT (GROVELAND) MUNICIPAL SANITARY LANDFILL
CLASS III LANDFILL
TUOLUMNE COUNTY

The landfill consists of a 10-acre site, of which 5-acres is dedicated to refuse disposal. The landfill is in a rural area with the majority of the surrounding land owned by the Federal Bureau of Land Management (BLM). The landfill itself sits on BLM land and is leased for use by the County. The lease expired in 1992, but was granted an extension while the County seeks to purchase the land under a federal program established in 1992.

The facility has been in operation since 1965 and received about 5% of the County's refuse, mainly from the Highway 120 corridor. The facility operated as a burn dump from 1967 to 1975. The facility was then operated as a "canyon fill" landfill. The County ceased accepting waste in May 2001. The total waste volume was estimated to be 124,863 cubic yards at the end of 2000.

The highest concentration of residences is approximately one-half mile to the northeast of the site. The landfill is at the upper end of a ravine near the apex of a knoll. The site is characterized by a lack of soil mantle and 10 to 20 feet of weathered rock (slate) atop bedrock. The underlying bedrock is reported to be deficient in fine materials. In general, the hydrologic regime at this site is expected to be a hardrock, fracture-dominated type, with water moving in water-bearing fractures and veins. Seasonal saturated flow may occur along the weathered rock/unweathered rock interface.

Groundwater in this area is reported to be limited. The majority of domestic water is supplied by the Groveland Community Services District, which derives its water source from the underground Hetch Hetchy Mountain Tunnel. A scattering of domestic supply wells can be found in the area within one-half mile of the site. These wells are reported to tap moderately deep fractures (100 - 300 feet) with varying yields.

An average of 36 inches of rain falls at this site, mainly during the period of November through May. The rest of the year is characteristically hot and dry weather with an average evaporation rate of 50 inches. Most surface runoff during the wet season is to a diked pond at the base of the landfill. This pond most likely catches landfill leachate as well. It has routinely overflowed in the past to Little Jackass Creek. Groundwater sampling has confirmed the presence of volatile organic compounds (VOCs) in the groundwater beneath the site. Corrective action for this problem was proposed and submitted in *Corrective Action Plan and Water Quality Monitoring Plan for Tuolumne County Big Oak Flat Landfill, by Phase Three Environmental Management, March 1993*.

Final Closure/Post-Closure Maintenance Plan for Big Oak Flat – Groveland Landfill, October 2000, with Revisions 1 and 2 (March 2001 and October 2001, respectively), were submitted by Bryan A. Stirrat & Associates, Inc. to propose the final closure plan for the landfill.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2002-0142
FOR
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND
MANAGEMENT AND COUNTY OF TUOLUMNE DEPARTMENT OF PUBLIC WORKS
FOR
CLOSURE
BIG OAK FLAT (GROVELAND) MUNICIPAL SOLID WASTE LANDFILL
TUOLUMNE COUNTY

Compliance with this Monitoring and Reporting Program, with Title 27, California Code of Regulations, Section 20005, et seq. (hereafter Title 27), and with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Non-hazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258)*, dated April 2000, is ordered by Waste Discharge Requirements Order No. R5-2002-0142.

A. REQUIRED MONITORING REPORTS

| <u>Report</u> | <u>Due</u> |
|--|---------------------|
| 1. Groundwater Monitoring (Section D.1) | See Table I |
| 2. Annual Monitoring Summary Report (Order No. R5-2002-0142, F.6.) | Annually |
| 3. Surface Water Monitoring (Section D.4) | See Table II |
| 4. Facility Monitoring (Section D.5) | As necessary |
| 5. Response to a Release (Standard Provisions and Reporting Requirements) | As necessary |

B. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in Order No. R5-2002-0142 and the Standard Provisions and Reporting Requirements. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the waste discharge requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the

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date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format acceptable to the Executive Officer.

Each monitoring report shall include a compliance evaluation summary as specified in F. Reporting Requirements, of Order No. R5-2002-0142.

Field and laboratory tests shall be reported in each monitoring report. Quarterly and annual monitoring 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.

| <u>Sampling Frequency</u> | <u>Reporting Frequency</u> | <u>Reporting Periods End</u> | <u>Report Date Due</u> |
|---------------------------|----------------------------|------------------------------|------------------------|
| Quarterly | Quarterly | 31 March | 30 April |
| | | 30 June | 31 July |
| | | 30 September | 31 October |
| | | 31 December | 31 January |
| Annually | Annually | 31 December | 31 January |

The Discharger shall submit an **Annual Monitoring Summary Report** to the Board covering the previous monitoring year. The annual report shall contain the information specified in F. Reporting Requirements, of Order No. R5-2002-0142, and a discussion of compliance with the waste discharge requirements and the Water Quality Protection Standard.

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

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

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

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

The report shall:

- a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a Unit or portion of a Unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program and groundwater monitoring program. The map shall include the point of compliance in accordance with §20405 of Title 27.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

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

2. **Constituents of Concern**

The constituents of concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The constituents of concern for all Units at the facility are those listed in Tables I and II for the specified monitored medium, and Table IV. The Discharger shall monitor all constituents of concern every five years, or more frequently as required in accordance with a Corrective Action Program.

a. **Monitoring Parameters**

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

for the specified monitored medium.

3. Concentration Limits

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to §20415 of Title 27; or
- b. By an alternate statistical method acceptable to the Executive Officer in accordance with §20415 of Title 27.

{The established concentration limits for naturally occurring constituents of concern are listed in Table IV.}

4. Point of Compliance

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

5. Compliance Period

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

D. MONITORING

The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, in accordance with Detection Monitoring Specification E.2 and E.4 of Waste Discharge Requirements, Order No. R5-2002-0142. All monitoring shall be conducted in accordance with a Sample Collection and Analysis Plan, which includes quality assurance/quality control standards, that is acceptable to the Executive Officer.

All point of compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality

Protection Standard. All detection monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, leachate, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern as indicated and listed in Tables I and II.

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

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

1. Groundwater

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

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

Hydrographs of each well shall be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.

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

The monitoring parameters shall also be evaluated each reporting period with regards to the cation/anion balance, and the results shall be graphically presented

using a Stiff diagram, a Piper graph, or a Schueller plot. Samples for the constituents of concern specified in Table I shall be collected and analyzed in accordance with the methods listed in Table IV every five years.

2. Surface Water Monitoring

The Discharger shall install and operate a surface water detection monitoring system where appropriate that complies with the applicable provisions of §20415 and §20420 of Title 27 and has been approved by the Executive Officer.

For all monitoring points and background monitoring points assigned to surface water detection monitoring, samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table II. All surface water monitoring samples shall be collected and analyzed for the constituents of concern specified in Table II every five years. All monitoring parameters shall be graphed so as to show historical trends at each sample location.

3. Facility Monitoring

a. Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the drainage control system, groundwater monitoring equipment (including wells, etc.), and shall include the Standard Observations contained in section F.4.f. of Order No. R5-2002-0142. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. By **15 November** of each year, the Discharger shall submit an annual report describing the results of the inspection and the repair measures implemented, including photographs of the problem and the repairs.

b. Storm Events

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

MONITORING AND REPORTING PROGRAM NO. R5-2002-0142 7
U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT AND
COUNTY OF TUOLUMNE DEPARTMENT OF PUBLIC WORKS
FOR CLOSURE BIG OAK FLAT (GROVELAND) MUNICIPAL SOLID WASTE LANDFILL
TUOLUMNE COUNTY

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

Ordered by: _____

THOMAS R. PINKOS,
Acting Executive Officer

19 July 2002

CBH: 05/20/2002

TABLE I
GROUNDWATER DETECTION MONITORING PROGRAM

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

TABLE II

SURFACE WATER DETECTION MONITORING PROGRAM

| <u>Parameter</u> | <u>Units</u> | <u>Frequency</u> |
|---|-----------------|------------------|
| Field Parameters | | |
| Temperature | °C | Quarterly |
| Electrical Conductivity | µmhos/cm | Quarterly |
| pH | pH units | Quarterly |
| Turbidity | Turbidity units | Quarterly |
| Monitoring Parameters | | |
| Total Dissolved Solids (TDS) | mg/L | Quarterly |
| Carbonate | mg/L | Quarterly |
| Bicarbonate | mg/L | Quarterly |
| Chloride | mg/L | Quarterly |
| Nitrate - Nitrogen | mg/L | Quarterly |
| Sulfate | mg/L | Quarterly |
| Calcium | mg/L | Quarterly |
| Magnesium | mg/L | Quarterly |
| Potassium | mg/L | Quarterly |
| Sodium | mg/L | Quarterly |
| Volatile Organic Compounds (USEPA Method 8260B, see Table III) | µg/L | Quarterly |
| Constituents of Concern (see Table IV) | | |
| Total Organic Carbon | mg/L | 5 years |
| Inorganics (dissolved) | mg/L | 5 years |
| Volatile Organic Compounds (USEPA Method 8260B, extended list) | µg/L | 5 years |
| Semi-Volatile Organic Compounds (USEPA Method 8270C) | µg/L | 5 years |
| Chlorophenoxy Herbicides (USEPA Method 8151A) | µg/L | 5 years |
| Organophosphorus Compounds (USEPA Method 8141A) | µg/L | 5 years |

TABLE III

MONITORING PARAMETERS FOR DETECTION MONITORING

Surrogates for Metallic Constituents:

pH
Total Dissolved Solids
Electrical Conductivity
Chloride
Sulfate
Nitrate nitrogen

Constituents included in VOC:

USEPA Method 8260B

Acetone
Acrylonitrile
Benzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans-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)
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
2-Hexanone (Methyl butyl ketone)
Hexachlorobutadiene

TABLE III

MONITORING PARAMETERS FOR DETECTION MONITORING

Continued

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

TABLE IV
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

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

Volatile Organic Compounds:

USEPA Method 8260

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

TABLE IV

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

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

TABLE IV

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

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

Semi-Volatile Organic Compounds:

USEPA Method 8270 - base, neutral, & acid extractables

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

TABLE IV

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Dieldrin
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-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
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethyl methanesulfonate
Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorocyclopentadiene
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isodrin
Isophorone
Isosafrole

TABLE IV

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

Kepone
Methapyrilene
Methoxychlor
3-Methylcholanthrene
Methyl methanesulfonate
2-Methylnaphthalene
1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine
o-Nitroaniline (2-Nitroaniline)
m-Nitroaniline (3-Nitroaniline)
p-Nitroaniline (4-Nitroaniline)
Nitrobenzene
o-Nitrophenol (2-Nitrophenol)
p-Nitrophenol (4-Nitrophenol)
N-Nitrosodi-n-butylamine (Di-n-butylnitrosamine)
N-Nitrosodiethylamine (Diethylnitrosamine)
N-Nitrosodimethylamine (Dimethylnitrosamine)
N-Nitrosodiphenylamine (Diphenylnitrosamine)
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine)
N-Nitrosomethylethylamine (Methylethylnitrosamine)
N-Nitrosopiperidine
N-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
Toxaphene
2,4,5-Trichlorophenol
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

TABLE IV

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

Chlorophenoxy Herbicides:

USEPA Method 8151A

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

Organophosphorus Compounds:

USEPA Method 8141A

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