CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO.
EL DORADO COUNTY
UNION MINE LANDFILL
CLASS II LANDFILL, CLOSED CLASS III LANDFILL
AND CLASS II SURFACE IMPOUNDMENT
EL DORADO COUNTY

The Discharger shall maintain water quality monitoring systems that are appropriate for detection monitoring and evaluation monitoring and that comply with the provisions of Title 27, California Code of Regulations (CCR), Division 2, Subdivision 1, Chapter 3, Subchapter 3.

Waste Discharge Requirements Order No. _____ and Standard Provisions and Reporting Requirements require compliance with this Monitoring and Reporting Program. Failure to comply with this Program, or with the Standard Provisions and Reporting Requirements, constitutes non-compliance with the WDRs and with the Water Code, which can result in the imposition of civil monetary liability.

A. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in 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 non-compliance with the WDRs. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The Discharger shall summarize the data to clearly illustrate compliance with waste discharge requirements or the lack thereof. A short discussion of the monitoring results, including notations of any water quality violations, shall precede the tabular summaries.

The Discharger shall report field and laboratory test results in semi-annual monitoring reports. The Discharger shall submit the semi-annual monitoring reports to the Regional Board by **31 January** (Fall report) and **31 July** (Spring report) of each year. The Spring report shall constitute the semi-annual report for data collected between the previous 1 January and 30 June. The Fall report shall constitute the semi-annual report for data collected between 1 July and 31 December of the previous calendar year. The Fall report shall also constitute the annual report for the previous calendar year summarizing data collected over the entire calendar year. The annual report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous twelve months, so as to show historical trends at each well. The Discharger shall report to the Regional Board the results of any monitoring done more frequently than specified herein.

The Discharger shall report method detection limits and practical quantitation limits. The report shall include all method peaks, including those which the Discharger cannot quantify and/or specifically identify.

B. REQUIRED MONITORING REPORTS

1. Water Quality Protection Standard Report

The Discharger submitted a water quality protection standard in February 1998. The Discharger shall describe any changes to the water quality protection standard in the annual monitoring report.

2. Detection Monitoring Report

The Discharger shall submit reports of the results of detection monitoring in accordance with the schedules specified in this Monitoring and Reporting Program.

3. Annual Monitoring Summary Report

The Discharger shall submit the Annual Monitoring Summary Report as specified in the Standard Provisions and Reporting Requirements and in this Monitoring and Reporting Program.

4. Constituents-of-Concern Five-Year Monitoring Program

The Discharger shall sample all Monitoring Points and Background Monitoring Points for each monitored medium for all Constituents of Concern (COCs) every fifth year, beginning with the Spring of 2006, with subsequent COC monitoring efforts being carried out every fifth year thereafter alternately in the Spring and Fall.

Standard Observations

Each monitoring report shall include a summary and certification of completion of all Standard Observations for the waste management unit (WMU), for the perimeter of the WMU, and for the receiving waters. The Discharger shall conduct standard observations weekly and shall include those elements as defined in the Standard Provisions and Reporting Requirements.

C. MONITORING

If the Discharger, through a detection monitoring program, or the Regional Board finds that there is a measurably significant increase in indicator parameters or waste constituents over the water quality protection standards (established pursuant to Monitoring and Reporting Program No. _____) at or beyond the Points of Compliance, the Discharger shall notify the Regional Board or acknowledge the Regional Board's finding in writing within seven days, and shall immediately resample for the constituent(s) or parameter(s) at the point where the standard was exceeded. Within 90 days, the Discharger shall submit to the Regional Board the results of the re-sampling and either:

a. a report demonstrating that the water quality protection standard was not, in fact, exceeded; or

b. an amended Report of Waste Discharge for the establishment of an evaluation monitoring program, per Section 20415 and 20425 of Title 27, which is designed to evaluate changes in water quality due to the release from the landfills.

If the Discharger, through an evaluation monitoring program, or the Regional Board verifies that water quality protection standards have been exceeded at or beyond the Points of Compliance, the Discharger shall notify the Regional Board or acknowledge the Regional Board's finding in writing within seven days. Within 180 days, the Discharger shall submit to the Regional Board an amended Report of Waste Discharge for the establishment of a corrective action program, per Section 20430 of Title 27, which is designed to remediate releases from the facility and to achieve compliance with the water quality protection standards.

D. REQUIRED MONITORING PROGRAMS

1. Solid Waste, Leachate, and LCRS Monitoring Program

Designated and Non-hazardous Solid Waste Monitoring

The Discharger shall monitor all wastes discharged to the Class II landfill on a monthly basis and submit the results with the corresponding semi-annual report:

Parameter	Report in Units of	Monitoring Frequency
Quantity Discharged to:		
Class II landfill	Yds^3 or tons	Monthly
Capacity of Landfill Unit Remaining	Percent	Yearly

Liquid and Semi-Liquid Waste Monitoring

The Discharger shall monitor all wastes discharged to the Class II surface impoundment and report to the Regional Board on a semi-annual basis:

Parameter	Report in Units of	Monitoring Frequency
Quantity discharged	Gallons/day	Continuous
Type of Material Discharged	- -	Continuous
Minimum Freeboard	Feet and Tenths	Weekly

In addition, the Discharger shall collect grab samples of the Class II surface impoundment contents and analyze the samples for the parameters and constituents listed below under "Leachate Monitoring" at the frequencies indicated thereunder.

Leachate Monitoring

The Class III landfill unit does not have a Leachate Collection and Removal System (LCRS). However there is a leachate collection toe drain along the junction of the Class III and Class II landfills and around the northern perimeter of the Class III unit. In addition, the Class II landfill has an LCRS. The Class II surface impoundment has a geonet LCRS and collection sump.

The Discharger shall inspect all landfill unit and surface impoundment LCRS sumps and conveyance systems weekly for leachate generation. If leachate is present in any sumps and conveyance systems, the Discharger shall immediately sample the leachate and continue to sample at the frequencies listed in Table 1. Sampling locations shall include

the pipe that discharges leachate to the Class II surface impoundment, the liquid withing the Class II surface impoundment, and any liquid in the sump for the Class II surface impoundment. The Discharger shall also measure the quantity of leachate pumped from the Class II surface impoundment LCRS and report the quality as Leachate Volume (in gallons/day). The Discharger shall report the data in the semi-annual monitoring reports.

TABLE 1 - LEACHATE AND CLASS II SURFACE IMPOUNDMENT MONITORING PROGRAM

Parameter	Units	Monitoring Frequency
Field Parameters		
Flow Rate	gallons/day	Monthly
pH	Number	Monthly
Specific Conductance	µmhos/cm	Monthly
Monitoring Parameters		
Bicarbonate Alkalinity	mg/L	Annually
Carbonate	mg/L	Annually
Chloride	mg/L	Annually
Nitrate Nitrogen	mg/L	Annually
Sulfate	mg/L	Annually
Total Dissolved Solids (TDS)	mg/L	Annually
Volatile Organic Compounds (EPA Method 8260B, Attachment C)	µg/l	Annually
Constituents of Concern		
Inorganics[1]	µg/L	5-year
Total Organic Carbon	mg/L	5-year
Volatile Organic Compounds (EPA Method 8260B, Attachment D)	µg/L	5-year
Semi-volatile Organic Compounds (EPA Method 8270C, Attachment D)	µg/L	5-year
Chlorinated Herbicides (EPA Method 8150A, Attachment D)	µg/L	5-year
Organophosphorus Compounds (EPA Method 8141A, Attachment D)	µg/L	5-year

[1] Inorganics (dissolved): Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Cyanide, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Silver, Sulfide, Thallium, Tin, Vanadium, and Zinc.

LCRS Monitoring

The Discharger shall test all LCRSs annually to demonstrate operation in conformance with waste discharge requirements. The Discharger shall report the results of these tests

to the Regional Board and shall include comparisons with earlier tests made under comparable conditions. The Discharger shall report the data in the annual monitoring report.

2. Detection Monitoring Program

Once each Spring and Fall, the Discharger shall monitor all Monitoring Points assigned to detection monitoring and all Background Monitoring Points (for each monitored medium) for the Monitoring Parameters listed in this Program.

For any given monitored medium, the Discharger shall collect a sufficient number of samples from all Monitoring Points and Background Monitoring Points to satisfy the data analysis requirements for a given Reporting Period. The Discharger shall collect the samples in a manner that ensures sample independence to the greatest extent feasible.

Groundwater sampling shall include an accurate determination of the groundwater surface elevation and field parameters (pH, temperature, electrical conductivity, turbidity) for all monitoring points. The Discharger shall measure groundwater elevations prior to purging and sampling the wells to fulfill the groundwater gradient and direction requirements. For each monitored groundwater body, the Discharger shall measure the water level in each well (in feet and hundredths, MSL) and determine groundwater gradient and direction at least semi-annually, including the times of expected highest and lowest water level elevations for the respective groundwater body. The Discharger shall display this information on a water table contour map and/or groundwater flow net for the site and submit the map with the semi-annual monitoring reports.

The Discharger shall measure groundwater elevations for all background and downgradient wells for a given groundwater body within a period of time short enough to avoid temporal groundwater flow variations which could preclude accurate determination of groundwater gradient and direction.

The Discharger shall perform statistical or non-statistical analysis when the monitoring data are available.

3. Groundwater Monitoring

The monitoring network shall consist of background monitoring wells MW-5, MW-6, MW-10, and MW-B, and downgradient monitoring wells MW-7, MW-9, UM-3, MW-A, and MW-11. Attachment B of Order No. _____ shows the locations of these wells. Prior to abandonment of monitoring wells due to construction or expansion activities at the site, the Discharger shall install replacement monitoring wells. The Discharger shall collect samples from the wells at the frequency and for the parameters specified in Table 2. The Discharger shall report the data in the semi-annual monitoring reports.

The Discharger shall sample all new monitoring wells on a quarterly basis for the parameters in Table 2 until there is sufficient data for statistical analysis. Thereafter, the Discharger shall sample the new monitoring wells semi-annually.

TABLE 2 - GROUNDWATER MONITORING PROGRAM

Parameter	Units	Monitoring Frequency
Field Parameters		
Groundwater Elevation	Ft. & 100ths, MSL	Semiannually
pH	Number	Semiannually
Specific Conductance	µmhos/cm	Semiannually
Temperature	°F	Semiannually
Turbidity	Turbidity units	Semiannually
Monitoring Parameters		
Anions/Cations[1]	mg/L	Semiannually
Chloride	mg/L	Semiannually
Dissolved Arsenic[3]	mg/L	Semiannually
Dissolved Iron[3]	mg/L	Semiannually
Total Dissolved Solids (TDS)	mg/L	Semiannually
Volatile Organic Compounds (EPA Method 8260B, Attachment C)	µg/L	Semiannually
Constituents of Concern		
Inorganics[2]	µg/L	5-year
Total Organic Carbon	mg/L	5-year
Volatile Organic Compounds (EPA Method 8260B, Attachment D)	µg/L	5-year
Semi-volatile Organic Compounds (EPA Method 8270C, Attachment D)	µg/L	5-year
Chlorinated Herbicides (EPA Method 8150A, Attachment D)	µg/L	5-year
Organophosphorus Compounds (EPA Method 8141A, Attachment D)	µg/L	5-year

1 Anions/Cations: Bicarbonate, Carbonate, Nitrate, Sulfate, Calcium, Magnesium, Potassium, and Sodium.

2 Inorganics (dissolved): Aluminum, Antimony, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Cyanide, Lead, Manganese, Mercury, Nickel, Selenium, Silver, Sulfide, Thallium, Tin, Vanadium, and Zinc.

3 These parameters have been excluded from detection monitoring in order to reduce the risk of false positive indications and to therefore increase the reliability of detecting a leachate release. They are included as supplemental parameters for water quality trend analysis.

4. Surface Water Monitoring

The Discharger shall sample Martinez Creek upstream of the waste management facility at upstream monitoring point S-6 and downstream at monitoring point S-7, and at surface

water discharge points S-1 and S-2. The Discharger shall collect surface water samples after the first storm of the rainy season which produces significant flow and quarterly thereafter when water is present. The Discharger shall collect samples from all stations and analyze at the frequency and for the monitoring parameters specified in Table 3. The Discharger shall submit the surface water monitoring reports with the corresponding semi-annual groundwater monitoring reports. The Discharger shall include an evaluation of surface water quality impacts and compliance with the Water Quality Protection Standard.

The Discharger shall continue to monitor storm water discharges in accordance with Water Quality Order No. 97-03-DWQ (Discharges of Storm Water Associated with Industrial Activities).

TABLE 3 - SURFACE WATER MONITORING PROGRAM

Parameter	**Units**	**Monitoring Frequency**
Field Parameters		
pH	Number	Quarterly
Specific Conductance	µmhos/cm	Quarterly
Temperature	°F	Quarterly
Turbidity	Turbidity units	Quarterly
Monitoring Parameters		
Anions/Cations[1]	mg/L	Quarterly
Chloride	mg/L	Quarterly
Dissolved Arsenic	mg/L	Quarterly
Dissolved Copper	mg/L	Quarterly
Dissolved Iron	mg/L	Quarterly
Dissolved Zinc	mg/L	Quarterly
Total Dissolved Solids (TDS)	mg/L	Quarterly
Total Suspended Solids	mg/L	Quarterly
Constituents of Concern		
Total Organic Carbon	mg/L	5-year
Inorganics[2]	µg/L	5-year

[1] Anions/Cations: Bicarbonate, Carbonate, Nitrate, Sulfate, Calcium, Magnesium, Potassium, and Sodium.

[2] Inorganics (dissolved): Aluminum, Antimony, Barium, Beryllium, Cadmium, Chromium, Cobalt, Cyanide, Lead, Manganese, Mercury, Nickel, Silver, Thallium, Tin, Selenium, Sulfide, and Vanadium.

In addition, the Discharger shall sample one seep (designated MS-1) from along the western side of Church Mine Road, downslope of the Class II surface impoundment. The Discharger shall analyze the seep quarterly for TDS, pH, chloride, arsenic, and iron. The Discharger shall report the data in the semi-annual monitoring reports.

5. Unsaturated Zone Monitoring

The unsaturated zone monitoring network shall consist of two vacuum lysimeters beneath the Class II surface impoundment (L2N and L2S). The Discharger shall install additional lysimeters beneath new landfill expansion areas at locations approved by Regional Board staff pursuant to Discharge Specification B.13 of the WDRs. The Discharger shall analyze soil-pore liquid samples (when sufficient liquid is recovered for analysis) at the frequency and for the monitoring parameters specified in Table 4.

The Discharger shall submit unsaturated zone monitoring reports with the corresponding semi-annual monitoring report and shall include evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

TABLE 4 - UNSATURATED ZONE MONITORING PROGRAM

Parameter	Units	Monitoring Frequency
Field Parameters		
pH	Number	Quarterly
Specific Conductance	µmhos/cm	Quarterly
Monitoring Parameters		
Bicarbonate Alkalinity	mg/L	Semiannually
Carbonate	mg/L	Semiannually
Chloride	mg/L	Semiannually
Nitrate Nitrogen	mg/L	Semiannually
Sulfate	mg/L	Semiannually
Total Dissolved Solids (TDS)	mg/L	Semiannually
Volatile Organic Compounds (EPA Method 8260B, Attachment C)	µg/L	Semiannually
Constituents of Concern		
Inorganics[1]	µg/L	5-year
Total Organic Carbon	mg/L	5-year
Volatile Organic Compounds (EPA Method 8260B, Attachment D)	µg/L	5-year
Semi-volatile Organic Compounds (EPA Method 8270C, Attachment D)	µg/L	5-year
Chlorinated Herbicides (EPA Method 8150A, Attachment D)	µg/L	5-year
Organophosphorus Compounds (EPA Method 8141A, Attachment D)	µg/L	5-year

[1] Inorganics (dissolved): Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Cyanide, Iron, Lead, Mercury, Manganese, Nickel, Selenium, Silver, Sulfide, Thallium, Tin, Vanadium, and Zinc.

6. Pendar Tunnel and Groundwater Drains Monitoring

The Discharger shall monitor discharges from the Pendar Tunnel and the three groundwater drains (the Class II Underdrain: GWD-1, the Union Mine Road Underdrain: GWD-2, and the groundwater drain west of the spray fields: GWD-3) shown on Attachment B. These locations shall be inspected monthly. For each discharge point the Discharger shall collect water samples within one month after flows begin and quarterly thereafter when water is present. The Discharger shall analyze the samples for pH (field), specific conductance (field), total dissolved solids, dissolved arsenic, dissolved iron, and sulfate.

The Discharger shall submit the Pendar Tunnel and the groundwater drains monitoring reports with the corresponding semi-annual monitoring report and shall include evaluation of potential impacts of these discharges on Martinez Creek.

E. WATER QUALITY PROTECTION STANDARDS

The Water Quality Protection Standard (Standard) shall consist of the following elements:

1. Constituents of Concern;
2. Concentration Limits;
3. Monitoring Points;
4. Points of Compliance;
5. Compliance Period.

Each of these is described as follows:

1. Constituents of Concern

The 'COC list' (list of Constituents of Concern required under 27 CCR 20395) shall include all constituents listed in Tables 1, 2, 3, and 4 and in Waste Discharge Requirements Order No. _____.

2. Concentration Limits

The Discharger shall determine the Concentration Limit for any given Constituent of Concern or Monitoring Parameter in a given monitored medium (i.e., groundwater, surface water, and the unsaturated zone) at WMUs. The Discharger shall use background wells to establish concentration limits for groundwater for each constituent of concern and shall update concentration limits at least annually. The Discharger shall use the limits as the basis of comparison with data from the Monitoring Points in that monitored medium.

3. Monitoring Points

Attachment B shows the approximate locations of the following monitoring points:

<u>Groundwater Monitoring Points</u>

The groundwater monitoring network for the landfill area consists of three upgradient wells (MW-5, 6 and 10) and four downgradient wells (MW-7, 9 and 11, and UM-3). The groundwater monitoring network for the Class II surface impoundment consists of one upgradient well (MW-C) and one downgradient well (MW-A).

Unsaturated Zone Monitoring Points

The unsaturated zone monitoring points shall be the lysimeters located within the Class II surface impoundment (L2N and L2S).

Seep Monitoring Point

The seep monitoring point shall be MS-1 (along the western side of Church Mine Road, downslope of the Class II surface impoundment).

Surface Water Monitoring Points

The surface water monitoring points for detection monitoring shall be:

S-1 In the tributary (formerly the unnamed creek) channel downgradient of the Springfield Shaft and Springfield West Adit to sample for any potential seeps developing from the mine seals.

S-2 Outfall from north sedimentation pond before discharge enters Martinez Creek.

S-6 Martinez Creek, 600 feet upstream from north sedimentation pond discharge.

S-7 Martinez Creek, approximately 450 feet downstream from north sedimentation pond discharge. S-7 is the surface water point of compliance.

4. Point of Compliance

The Point of Compliance for groundwater shall be the vertical surface located at the hydraulically downgradient limit of the waste management units that extends through the uppermost aquifer underlying the units.

5. Compliance Period

The Compliance Period is the number of years equal to the active life of the waste management unit plus the closure period. Each time the Discharger exceeds the Water Quality Protection Standard (i.e., a release is discovered), the facility begins a Compliance Period on the date the Regional Board directs the Discharger to begin an Evaluation Monitoring Program. If the Discharger's Corrective Action Program (CAP) has not achieved compliance with the Standard by the scheduled end of the Compliance Period, the Compliance Period is automatically extended until the facility has been in continuous compliance for at least three consecutive years.

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

Ordered by _____
KENNETH D. LANDAU
Acting Executive Officer

_____
(Date)

WLB