CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

REVISED MONITORING AND REPORTING PROGRAM NO. R5-2003-0046

FOR
COUNTY OF SACRAMENTO, PUBLIC WORKS AGENCY
ELK GROVE CLASS III LANDFILL
POST CLOSURE MAINTENANCE AND CORRECTIVE ACTION
SACRAMENTO COUNTY

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

Revised Monitoring and Reporting Program (MRP) No. R5-2003-0046, including Attachments A, B, C, and D, and the Standard Provisions and Reporting Requirements (Standard Provisions), dated August 1997, are part of Waste Discharge Requirements (WDRs) Order No. R5-2003-0046. WDRs Order No. R5-2003-0046 and the Standard Provisions require compliance with this MRP. Failure to comply with this MRP, or with the Standard Provisions, constitutes non-compliance with the WDRs and with the Water Code, which can result in the imposition of civil monetary liability.

## A. MONITORING

### 1. Groundwater Monitoring

The Discharger shall sample groundwater from each groundwater Monitoring Point listed in Section C.3 of this MRP (locations shown on Attachment B), and any other monitoring wells installed after adoption of these WDRs. The Discharger shall collect samples from the groundwater Monitoring Points as specified in Table 1. Sample collection shall follow standard EPA protocol.

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 quarterly, including the times of expected highest and lowest water level elevations for the respective groundwater body. Groundwater elevations shall be measured 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.

Monitoring of five year Constituents of Concern for groundwater shall be completed every fifth year, alternating the first and third quarters. The next five-year monitoring event shall be conducted during 2010.

## 2. Surface Water Monitoring

The Discharger shall sample Laguna Creek at surface water Monitoring Points R-1, R-2, R-3 and R-4 (as shown on Attachment B). The Discharger shall collect surface water samples after the first storm of the rainy season which produces significant flow and during at least one other storm event in the wet season. The Discharger shall collect samples from each station as specified in Table 2. Sample collection shall follow standard EPA procedures.

Monitoring of five year Constituents of Concern for surface water shall be completed every fifth year during the first quarter. The next five-year monitoring event shall be conducted during 2010.

## 3. Groundwater Extraction Well Monitoring

During monitoring periods that they are operating, the Discharger shall monitor extraction wells EW-5 and EW-6 in accordance with Table 3. Samples shall be collected and analyzed both prior to and after treatment for each extraction well at the specified frequencies. Any future extraction wells that are installed shall also be monitored as specified in Table 3.

## 4. Unsaturated Zone Monitoring

The Discharger shall monitor on-site and off-site landfill gas probes for the presence of methane and carbon dioxide.

**TABLE 1 – GROUNDWATER MONITORING PROGRAM**

| Parameter | Units | Test Method | Frequency |
|---|---|---|---|
| Field Parameters | | | |
| Temperature | °F | Field Measure | Semiannual |
| Groundwater Elevation | Feet (100ths), MSL | Field Measure | Quarterly |
| Electrical Conductivity | µmhos/cm | Field Measure | Quarterly |
| pH | Number | Field Measure | Quarterly |
| Turbidity | NTU | Field Measure | Semiannual |
| Monitoring Parameters | | | |
| Bicarbonate | mg/l | EPA 310.1 | Semiannual |
| Carbonate | mg/l | EPA 403 | Semiannual |
| Chloride | mg/l | EPA 300.0 | Semiannual |
| Chemical Oxygen Demand | mg/l | EPA 410.4 | Semiannual |
| Dissolved Iron | mg/l | EPA 6010 | Semiannual |
| Magnesium | mg/l | EPA 6010 | Semiannual |
| Manganese | mg/l | EPA 6010 | Semiannual |
| Nitrate-Nitrogen | mg/l | EPA 300.0 | Semiannual |
| Sulfate | mg/l | EPA 300.0 | Semiannual |
| Total Dissolved Solids | mg/l | EPA 160.1 | Semiannual |
| Volatile Organic Compounds (See Attachment C) | ug/l | EPA 8260B | Quarterly/ Semiannual[1] |
| Constituents of Concern | | | |
| Total Organic Carbon | mg/l | EPA 415.1 | 5 years |
| Metals/General Mineral [2] | mg/l | Footnote 2 | 5 years |
| Semi-Volatile Organic Compounds (See Attachment D) | ug/l | EPA 8270B | 5 years |

[1] VOCs **Quarterly** for monitoring well MW-6 and MW-10. Piezometer MW-5 is required to be sampled for VOCs quarterly and is not required to be sampled for other constituents. Samples from all other monitoring wells shall be analyzed for VOCs quarterly for one year during the trial shutdown of the groundwater extraction system, and semiannually thereafter.

[2] Metals/General Mineral (by EPA 6010 except where noted): Aluminum, Antimony, Arsenic (EPA 7061), Barium, Beryllium, Cadmium, Calcium, Chromium (Total), Chromium 6+ (EPA 7197), Copper, Lead (EPA 7421), Mercury (EPA 7470), Nickel (EPA 7520), Potassium, Selenium (EPA 7741), Sodium, Silver, Sulfides (9030), Thallium (EPA 7841), Tin, and Vanadium, and Zinc.

**TABLE 2 - SURFACE WATER MONITORING PROGRAM**

| Parameter | Units | Test Method | Frequency |
|---|---|---|---|
| Field Parameters | | | |
| pH | Number | Field Measure | Each Winter[1] |
| Specific Conductance | µmhos/cm | Field Measure | Each Winter[1] |
| Temperature | °F | Field Measure | Each Winter[1] |
| Turbidity | NTU | Field Measure | Each Winter[1] |
| Monitoring Parameters | | | |
| Chloride | mg/l | EPA 300.0 | Each Winter[1] |
| Chemical Oxygen Demand | mg/l | EPA 410.4 | Each Winter[1] |
| Dissolved Iron | mg/l | EPA 6010 | Each Winter[1] |
| Nitrate-Nitrogen | mg/l | EPA 300.0 | Each Winter[1] |
| Manganese | mg/l | EPA 6010 | Each Winter[1] |
| Magnesium | mg/l | EPA 6010 | Each Winter[1] |
| Sulfate | mg/l | EPA 300.0 | Each Winter[1] |
| Total Dissolved Solids | mg/l | EPA 160.1 | Each Winter[1] |
| Total Suspended Solids | mg/l | EPA 160.2 | Each Winter[1] |
| Constituents of Concern | | | |
| Total Organic Carbon | mg/l | EPA 415.1 | 5 years |
| Metals/General Mineral [2] | ug/l | Footnote 2 | 5 years |

[1] The first storm of the rainy season and at least one other storm event during the wet season.

[2] Metals/General Mineral (by EPA 6010 except where noted): Aluminum, Antimony, Arsenic (EPA 7061), Barium, Beryllium, Cadmium, Calcium, Chromium (Total), Chromium 6+ (EPA 7197), Cobalt, Copper, Cyanide, Iron, Lead (EPA 7421), Manganese, Mercury (EPA 7470), Nickel (EPA 7520), Potassium, Selenium (EPA 7741), Silver, Sodium, Sulfides (9030), Thallium (EPA 7841), Tin, Vanadium, and Zinc.

**TABLE 3 – GROUNDWATER EXTRACTION WELL MONITORING PROGRAM**

| Parameter | Units | Test Method | Frequency |
|---|---|---|---|
| Field Parameters | | | |
| pH | Number | Field Measure | Quarterly[1] |
| Specific Conductance | µmhos/cm | Field Measure | Quarterly[1] |
| Temperature | °F | Field Measure | Quarterly[1] |
| Monitoring Parameters | | | |
| Bicarbonate | mg/l | EPA 310.1 | Quarterly[1] |
| Chloride | mg/l | EPA 300.0 | Quarterly[1] |
| Sulfate | mg/l | EPA 300.0 | Quarterly[1] |
| Total Dissolved Solids | mg/l | EPA 160.1 | Quarterly[1] |
| Volatile Organic Compounds (See Attachment C) | ug/l | EPA 8260B [3] | Various [1, 2, 4] |

[1] Pre-treatment samples from each active extraction well shall be **quarterly** during monitoring periods that they are active.

[2] The treated effluent from each active extraction well shall be monitored for VOCs **twice monthly** during periods that they are active. If any VOC exceeds the Practical Quantitation Limit (PQL) for a sample of treated groundwater, weekly monitoring shall be resumed until two consecutive samples are below the PQL. Trace detections below the PQL must be flagged.

[3] EPA Method 502.2 may be substituted for Method 8260B.

[4] Extraction wells EW-1 and EW-4 shall be monitored **quarterly** for VOCs only unless groundwater extraction is initiated in these wells.

## B. REPORTING

The Discharger shall report monitoring data and information as required in this MRP and as required in the Standard Provisions. 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.

### 1. Semiannual Reports

The Discharger shall report field and laboratory test results in semiannual monitoring reports. The Discharger shall submit the semiannual monitoring reports to the Board

by the **31th day of the month** following the calendar semester in which the samples were collected or observations made **(i.e., 31 July and 31 January of each year)**. 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. As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all reports shall be prepared by a registered professional or their subordinate and signed by the registered professional.

Each semiannual report is to include the information listed in the Standard Provisions as well as:

(a) Tabulated cumulative monitoring data including depth to groundwater measurements, groundwater elevations above mean sea level, groundwater, surface water, and unsaturated zone analytical data, and Concentration Limits;

(b) A groundwater contour map for the current quarter's groundwater elevation data showing hydraulic gradient and flow direction;

(c) A copy of the laboratory analytical reports; and

(d) The status of any ongoing remediation, including all applicable data.

**2. Annual Report**

The annual report is due **31 January** for the previous calendar year (The 2$^{nd}$ semester report and annual report may be combined.). 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, and shall propose Concentration Limits for each Constituent of Concern in each monitored medium. The Discharger shall report to the Board the results of any monitoring done more frequently than specified herein.
Each annual report is to include the information listed in the Standard Provisions as well as:

(a) Tabular and graphical summaries of all data obtained during the previous year;

(b) Groundwater contour maps for the previous year's groundwater elevation data showing hydraulic gradients and flow directions;

(c) A discussion of the long-term trends in the concentrations of any pollutants in groundwater and/or surface water;

(d) A description of all remedial activities including effectiveness and proposed changes or modifications in remedial action; and

(e) If applicable, an updated Water Quality Protection Standard including proposed Concentration Limits for all Constituents of Concern.

(f) Results of five-year monitoring of COCs for groundwater and surface water, when applicable. This is to be reported every five-years, beginning with the **31 January 2011** Annual Report.

## C. WATER QUALITY PROTECTION STANDARD

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

1. Constituents of Concern;
2. Concentration Limits;
3. Monitoring Points (groundwater and surface water);
4. Point of Compliance; and
5. Compliance Period.

Each of these is described as follows:

### 1. Constituents of Concern

The list of Constituents of Concern shall include all parameters listed in Tables 1, 2, and 3 of this MRP.

### 2. Concentration Limits

Groundwater:

The Concentration Limits for **groundwater** shall be those calculated by the Discharger from historical data at former background monitoring well MW-1. Groundwater at monitoring well MW-1 has been impacted by the landfill and is therefore no longer representative of background groundwater quality. The Concentration Limits for groundwater shall be as follows:

| Constituent | Units | Concentration Limit |
|---|---|---|
| Bicarbonate | mg/L | 287 |
| Carbonate | mg/L | 20 |
| Chloride | mg/L | 9.9 |
| Chemical Oxygen Demand | mg/L | 20 |
| Magnesium | mg/L | 17.5 |
| Manganese | mg/L | 0.050 |
| Nitrate | mg/L | 1.5 |

| | | |
|---|---|---|
| Sulfate | mg/L | 6.8 |
| Total Dissolved Solids | mg/L | 290 |
| Arsenic | ug/L | 6 |
| Cadmium | ug/L | 10 |
| Chromium | ug/L | 20 |
| Hexavalent Chromium | ug/L | 10 |
| Copper | ug/L | 230 |
| Lead | ug/L | 100 |
| Mercury | ug/L | 0.2 |
| Nickel | ug/L | 20 |
| Selenium | ug/L | 5 |
| Silver | ug/L | 10 |
| Zinc | ug/L | 160 |
| Acetone | ug/L | 10 |
| 2-Butanone | ug/L | 10 |
| Dichlorodifluoromethane | ug/L | 1 |
| Tetrachloroethene | ug/L | 0.06 |
| Vinyl Chloride | ug/L | 0.05 |
| All other VOCs | ug/L | 0.5 |
| All SVOCs | ug/L | Practical Quantitation Limit |

If the Discharger finds that the concentration of one or more Constituents of Concern have exceeded the above Concentration Limit(s) for groundwater, the Discharger shall perform the tasks outlined under the heading "**RESPONSE TO A RELEASE**" in the Standard Provisions.

Surface Water:

The Discharger shall determine the Concentration Limit for each Constituent of Concern or Monitoring Parameter for surface water. The Discharger shall use the Concentration Limits as the basis of comparison with data from the detection Monitoring Point for surface water (R-2). Background surface water Monitoring Point (R-1) shall be used to establish Concentration Limits for each naturally occurring Constituent of Concern.

On an annual basis, surface water Concentration Limits shall be updated for all Constituents of Concern for which there is sufficient data.

If the Discharger finds that the concentration of one or more Constituents of Concern have exceeded the Concentration Limit(s) for surface water, the Discharger shall perform the tasks outlined under the heading "**RESPONSE TO A RELEASE**" in the Standard Provisions.

## 3. Monitoring Points

The **groundwater** Monitoring Points shall be:

Background: Former background groundwater monitoring well MW-1 has been impacted and is no longer representative of background groundwater quality. Historical data from MW-1, prior to impacts, is now used to establish background groundwater quality for the facility.

Detection Monitoring: The detection monitoring wells for groundwater shall be monitoring wells MW-9 (deep), MW-10, MW-11, MW-12 and any other detection monitoring wells installed after the adoption of this Order.

Corrective Action Monitoring: The corrective action monitoring wells for groundwater shall be MW-1 through MW-6, MW-7R, and MW-8. These wells shall remain in the corrective action monitoring program until such time as monitoring data indicates that they are no longer impacted (all constituents of concern fall below concentration limits established by this Order) at which time they will move to the detection monitoring program.

The **surface water** Monitoring Points shall be:

Background:

R-1 In the Laguna Creek channel 20 feet downstream from the crossing of Laguna Creek under Waterman Road. R-1 shall be the background surface water Monitoring Point.

Detection:

R-2 In the Laguna Creek channel 2,500 feet downstream from the crossing of Laguna Creek under Waterman Road. R-2 shall be the detection surface water Monitoring Point.

Drainage Outfall:

R-3 The southern landfill surface drainage outfall adjacent to Laguna Creek.

R-4 The northern landfill surface drainage outfall adjacent to Laguna Creek.

## 4. Point of Compliance

The Point of Compliance for groundwater and the unsaturated zone 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. The Point of Compliance for surface water shall be the site property line.

**5. Compliance Period**

The Compliance Period is the number of years equal to the active life of the waste management unit plus at least three consecutive years of compliance with the Water Quality Protection Standard (as described in Title 27, Section 20410).

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

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

14 October 2008
Date

WLB

# ATTACHMENT C

**Volatile Organic Compounds (by 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)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans-1,4-Dichloro-2-butene
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-l,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Ethylbenzene
2-Hexanone (Methyl butyl ketone)
Methyl bromide (Bromomethene)
Methyl chloride (Chloromethane)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
4-Methyl-2-pentanone (Methyl isobutylketone)
Methyl tertiary butyl ether
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,1,1-Trichloethane (Methylchloroform)
1,1,2-Trichloroethane

## ATTACHMENT C - Continued

Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC-11)
1,2,3-Trichloropropane
Vinyl acetate
Vinyl chloride
Xylenes

# ATTACHMENT D

**Semivolatile Organics (USEPA Method 8270B - 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
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC (Lindane)
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methyethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)
4-Bromophenyl phenyl ether
Butyl benzyl phthalate (Benzyl butyl phthalate)
Chlordane
p-Chloroaniline
Chlorobenzilate
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene
o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)

## ATTACHMENT D

**Semivolatile Organics (continued):**

p-Dichlorobenzene (1,4-Dichlorobenzene)
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Dieldrin
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-Dimehtylphenol (m-Xylenol)
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
Diphenylamine
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethyl methacrylate
Ethyl methanesulfonate
Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isophorone
Isosafrole
Kepone
Methapyrilene

## ATTACHMENT D

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