

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2014-XXXX  
FOR  
AQUA CLEAR FARMS, INC. AND HATCH INVESTMENTS LIMITED PARTNERSHIP  
AQUA CLEAR FARMS FACILITY  
CLASS II SURFACE IMPOUNDMENTS AND LANDFILLS  
CONSTRUCTION, OPERATION, CLOSURE,  
POST-CLOSURE MAINTENANCE, AND CORRECTIVE ACTION  
SOLANO COUNTY

This monitoring and reporting program (MRP) is issued to Aqua Clear Farms, Inc. (facility owner and operator) and Hatch Investments Limited Partnership (landowner), hereafter referred to jointly as "Discharger", pursuant to California Water Code section 13267 and incorporates requirements for groundwater, surface water, and unsaturated zone monitoring and reporting; facility monitoring, maintenance, and reporting; and financial assurances reporting contained in California Code of Regulations, title 27, section 20005, et seq. (hereafter Title 27), Waste Discharge Requirements (WDRs) Order R5-2014-XXXX, and the Standard Provisions and Reporting Requirements dated November 2013 (SPRRs). Compliance with this MRP is ordered by the WDRs and the Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Central Valley Water Board or the Executive Officer. Failure to comply with this MRP, or with the SPRRs, constitutes noncompliance with the WDRs and with Water Code Section 13267, which can result in the imposition of civil monetary liability.

**A. 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 Standard Monitoring Specifications in Section I of the SPRRs. All monitoring shall be conducted in accordance with sample collection and analysis procedures plan approved by Central Valley Water Board staff.

All 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 (COCs) as indicated and listed in Tables 1 through 5.

The Discharger shall use USEPA test methods with the lowest achievable detection limit for that constituent taking any matrix interferences into account. The reporting limit shall be no higher than the practical quantitation limit. The Discharger shall report all trace concentrations that are between the detection limit and the practical quantitation limit. All metals analyses shall be for dissolved metals.

The monitoring program of this MRP includes:

<u>Section</u>	<u>Monitoring Program</u>
A.1	Groundwater Monitoring
A.2	Unsaturated Zone Monitoring
A.3	Surface Water Monitoring
A.4	Surface Impoundment Monitoring
A.5	LCRS Monitoring, Action Leakage Rate, and Annual LCRS Testing
A.6	Waste Discharge Monitoring
A.7	Facility Monitoring
A.8	Corrective Action Monitoring

### 1. **Groundwater Monitoring**

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. The detection monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27.

The current groundwater monitoring network, as shown on Attachment C of the WDRs, shall consist of the following (plus any new monitoring or extraction wells added after the date of this MRP, including those wells installed pursuant to Central Valley Water Board staff's 26 December 2013 letter):

<u>Well</u>	<u>Status</u>	<u>Purpose/Units Being Monitored</u>
6A	Background	Site Background Well
2R	Detection/Corrective Action	Basins 2 and 3
3R	GW Extraction/Corrective Action	Remove impacted groundwater
7A	Detection/Corrective Action	Basin 7
8R	Detection/Corrective Action	Basin 8
10R	GW Extraction/Corrective Action	Remove impacted groundwater
11R	Detection/Corrective Action	Basins 8 and 9
12R	Detection/Corrective Action	Basins 9 and 10
EMP-5	Detection/Corrective Action	Basins 2 through 5
EMP-6	Detection/Corrective Action	Basins 2 through 5
HA-3	Detection/Corrective Action	Offsite Evaluation
HA-7	Detection	Offsite Evaluation
HA1R	GW Extraction/Corrective Action	Remove impacted groundwater

Groundwater samples shall be collected at least semiannually from the background wells, detection monitoring wells, corrective action wells, and any additional wells added as part of the approved groundwater monitoring system. However, groundwater samples shall be collected quarterly from corrective action wells during 2016 and 2017 to assess the initial effectiveness of corrective action upgrades due by late 2015. The Discharger shall collect,

preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan. Depth to groundwater shall be measured to the nearest 0.01 feet. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in the following table:

<b>Table 1: Groundwater Monitoring</b>			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Groundwater Elevation	feet & hundredths, MSL	Quarterly	Semiannually
Temperature	°F	Quarterly/Semiannually <sup>3</sup>	Semiannually
Electrical Conductivity	umhos/cm	Quarterly/Semiannually <sup>3</sup>	Semiannually
pH	pH units	Quarterly/Semiannually <sup>3</sup>	Semiannually
Turbidity	NTU	Quarterly/Semiannually <sup>3</sup>	Semiannually
<u>Monitoring Parameters &amp; EPA Method</u>			
Total Dissolved Solids (160.1)	mg/L	Quarterly/Semiannually <sup>3</sup>	Semiannually
Chloride (300.0)	mg/L	Quarterly/Semiannually <sup>3</sup>	Semiannually
Sulfate (300.0)	mg/L	Quarterly/Semiannually <sup>3</sup>	Semiannually
TPH as Diesel (8015M)	mg/L	Semiannually	Semiannually
TPH as Oil and Grease (EPA 1664)	mg/L	Semiannually	Semiannually
Potassium (200.7)	mg/L	Annually	Annually
Sodium (200.7)	mg/L	Annually	Annually
Dissolved Metals <sup>1</sup>	ug/L	Annually	Annually
Formaldehyde <sup>2</sup> (8315)	ug/L	Annually	Annually
Volatile Organic Compounds (EPA 8260B)	ug/L	Annually	Annually
Semi-volatile organic compounds (EPA 8270)	ug/L	Annually	Annually

<sup>1</sup> Dissolved metals by EPA Method 200.7 except where noted: arsenic (200.9), barium, boron, magnesium, manganese, mercury (245.1), nickel, and zinc.

<sup>2</sup> Formaldehyde analysis required for Wells 7A, 8R, 11R, and 12R, and any new wells required for future double-lined basins.

<sup>3</sup> Corrective action wells 3R, 10R, and HA1R, and wells installed in response to staff's 26 December 2013 letter shall be sampled quarterly during 2016 and 2017 to assess the initial effectiveness of upgrades to corrective action. All other wells will be sampled semi-annually.

## 2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of Title 27,

sections 20415 and 20420. The current unsaturated zone detection monitoring system meets the applicable requirements of Title 27. The Discharger shall install unsaturated zone monitoring devices (after review and approval by Central Valley Water Board staff) each time a new Class II waste management unit is constructed.

The current unsaturated zone monitoring network, as shown on Attachment C, shall consist of:

<u>Mon Pt.</u>	<u>Status</u>	<u>Units Being Monitored</u>
LYS-B9	Detection	Basin 9
LYS-B10	Detection	Basin 10

Unsaturated zone samples shall be collected from the monitoring network listed above (and any lysimeters for future lined basins) and shall be analyzed for the parameters and constituents listed in the following table in accordance with the specified methods and frequencies.

<b>Table 2: Unsaturated Zone Monitoring</b>			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Moisture (Gypsum Block)	kilopascals	Semiannually	Semiannually
<u>Monitoring Parameters &amp; EPA Method</u>			
Total Dissolved Solids (160.1)	mg/L	Semiannually	Semiannually
Chloride (300.0)	mg/L	Semiannually	Semiannually
Sulfate (300.0)	mg/L	Semiannually	Semiannually
TPH as Diesel (EPA 8015M)	mg/L	Semiannually	Semiannually
TPH as Oil and Grease (EPA 1664)	mg/L	Semiannually	Semiannually
Dissolved metals <sup>1</sup>	ug/L	Annually	Annually
Volatile Organic Compounds (8260B)	ug/L	Annually	Annually

<sup>1</sup> Dissolved metals by EPA Method 200.7 except where noted: arsenic (200.9), barium, boron, magnesium, manganese, mercury (245.1), nickel, and zinc.

Note: Priority on sampling/analysis based on what may be a limited amount of liquid recovered from a suction lysimeter shall be: TDS, chloride, sulfate, VOCs, TPH as diesel, TPH as oil & grease, and then dissolved metals.

The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the approved Sample Collection and Analysis Plan.

Monitoring results for the unsaturated zone shall be included in monitoring reports and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

### 3. Surface Water Monitoring

The Discharger shall operate a surface water detection monitoring system for any facility where runoff from waste management unit areas flows or could flow to waters of the United States. Runoff from closed basins and areas outside of the open basins areas flows to the northeast corner of the site and offsite to a culvert that runs under Highway 113 to “Big Ditch” and then to the Delta. The Discharger collects a sample of runoff from the site twice per year at surface water monitoring point SW-1 at the northeast corner of the site prior to the culvert, as shown on Attachment C. The surface water detection monitoring system meets the applicable requirements of Title 27.

For surface water detection monitoring, the Discharger shall collect a sample of the site runoff at SW-1 twice per year and have it analyzed for the monitoring parameters and constituents in accordance with the methods and frequency specified in the following table:

<b>Table 3: Surface Water Monitoring</b>			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Temperature	°F	Twice per year <sup>1</sup>	Semiannually
Electrical Conductivity	umhos/cm	Twice per year <sup>1</sup>	Semiannually
pH	pH units	Twice per year <sup>1</sup>	Semiannually
Turbidity	NTU	Twice per year <sup>1</sup>	Semiannually
<u>Monitoring Parameters &amp; EPA Method</u>			
Total Dissolved Solids (160.1)	mg/L	Twice per year <sup>1</sup>	Semiannually
Chloride (300.0)	mg/L	Twice per year <sup>1</sup>	Semiannually
Sulfate (300.0)	mg/L	Twice per year <sup>1</sup>	Semiannually

<sup>1</sup> Beginning with the first storm of the rainy season and during at least one other storm event that produces runoff during the wet season.

#### 4. Surface Impoundment Monitoring

Water samples shall be collected from the active Class II surface impoundments in accordance with the following table:

<b>Table 4: Surface Impoundment Monitoring</b>			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Freeboard	feet and tenths	Weekly/Monthly <sup>1</sup>	Semiannually
Remaining Capacity	gallons	Monthly	Semiannually
Discharge Flow <sup>2</sup>	See note 2	Monthly	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
<u>Monitoring Parameters &amp; EPA Method</u>			
Total Dissolved Solids (160.1)	mg/L	Semiannually	Semiannually
Chloride (300.0)	mg/L	Semiannually	Semiannually
Sulfate (300.0)	mg/L	Semiannually	Semiannually
TPH as Diesel (8015M)	mg/L	Semiannually	Semiannually
TPH as Oil and Grease (EPA 1664)	mg/L	Semiannually	Semiannually
Potassium (200.7)	mg/L	Annually	Annually
Sodium (200.7)	mg/L	Annually	Annually
Dissolved Metals <sup>3</sup>	ug/L	Annually	Annually
Formaldehyde (8315)	ug/L	Annually	Annually
Volatile Organic Compounds (EPA 8260B)	ug/L	Annually	Annually
Semi-volatile Organic Compounds (EPA 8270)	ug/L	Annually	Annually

<sup>1</sup> Freeboard shall be measured weekly from 1 November through 30 April, and monthly otherwise. Freeboard shall be measured from the top of the lowest point on the surface impoundment berm down to the water level in the impoundment and shall be measured using markings on the primary geomembrane liner, a free-standing gauge, or other method approved by Central Valley Water Board staff. If there is no water in the impoundment at the time of the measurement, the measurement shall be taken to the lowest elevation of the drilling mud solids and shall be further noted as "dry". Freeboard measurements are not required for basins that are filled with dried drilling mud above the berms in all areas of the basin, and this shall be stated in the monitoring reports for such basins.

<sup>2</sup> Volume of drilling mud discharged into Class II surface impoundment in gallons or barrels per month (1 barrel = 42 gallons). See also: Waste Discharge Monitoring in MRP Section A.6, below.

<sup>3</sup> Dissolved metals by EPA Method 200.7 except where noted: arsenic (200.9), barium, boron, magnesium, manganese, mercury (245.1), nickel, and zinc.

## 5. LCRS Monitoring, Action Leakage Rate, and Annual LCRS Testing

**LCRS Monitoring:** The Discharger shall operate and maintain leachate collection and removal system (LCRS) sumps, record and calculate monthly leakage rates, and conduct annual testing of each LCRS in accordance with Title 27 and this monitoring program.

The current LCRS leachate sump monitoring points are:

<u>Mon Pt.</u>	<u>Unit Where Sump is Located</u>
Basin 9 Sump	Basin 9
Basin 10 Sump	Basin 10

All LCRS sumps for current and future double-lined basins shall be inspected monthly for the presence of leachate, and flow shall be recorded in accordance with the following table. LCRS sumps shall be inspected **monthly** for the presence of leachate and/or to record the flow totalizer reading. If leachate is detected in a previously dry sump, the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the leachate for Field and Monitoring Parameters listed in the following table. Leachate in the LCRS sump shall then be sampled for all parameters and constituents in accordance with the frequencies listed in the following table whenever liquid is present.

<b>Table 5: LCRS Monitoring</b>			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>			
Presence of leachate	observation	Monthly <sup>1</sup>	Semiannually
Flow Rate <sup>2</sup>	gallons/day	Monthly	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
<u>Monitoring Parameters &amp; EPA Method</u>			
Total Dissolved Solids (160.1)	mg/L	Semiannually	Semiannually
Chloride (300.0)	mg/L	Semiannually	Semiannually
Sulfate (300.0)	mg/L	Semiannually	Semiannually
Volatile Organic Compounds (8260B)	ug/L	Annually	Annually

<sup>1</sup> Monthly observation and/or recording of flow at totalizer.

<sup>2</sup> Flow in gallons per day from LCRS sump back to surface impoundment.

**Action Leakage Rate:** If monthly monitoring of the flow rate into the LCRS shows an exceedance of the Action Leakage Rate required by the WDRs, the Discharger shall follow the procedures in the WDRs under “B. Discharge Specifications”. Tabulated monthly leakage rates shall be included in the semiannual monitoring reports.

**Annual LCRS Testing:** All LCRSs shall be tested annually pursuant to Title 27, section 20340(d) to demonstrate proper operation. The results of these tests shall be reported to the Central Valley Water Board in the Annual Monitoring Report and shall include comparisons with earlier tests made under comparable conditions. The next test shall be completed during 2014.

**6. Waste Discharge Monitoring**

The Discharger shall monitor all wastes discharged to the active Class II surface impoundments on a monthly basis and report the results in the semiannual monitoring reports in accordance with the following table:

<b>Table 6: Waste Discharge Monitoring</b>		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
Quantity Discharged to each SI	gallons or barrels	Monthly
Approximated Remaining Capacity	gallons or barrels	Monthly
Minimum Freeboard	feet and tenths	Weekly/Monthly <sup>1</sup>

<sup>1</sup> Refer to freeboard monitoring requirements in MRP Section A.4, above.

**7. Facility Monitoring**

**a. Annual 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 repair and maintenance needed for exposed liner systems; LCRS pumps, piping and control systems; drainage control systems; groundwater monitoring wells; unsaturated zone monitoring systems; and shall assess preparedness for winter conditions including but not limited to the required surface impoundment capacity and erosion and sedimentation control. The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. Annual facility inspection reporting shall be submitted as required in Section B.5 of this MRP.

**b. Rainfall Monitoring**

The Discharger shall monitor and record onsite rainfall data using an automated rainfall gauge. Data shall be used in establishing the severity of storm events and wet seasons for comparison with design parameters used for waste management unit design and conveyance and drainage design. Rainfall data shall be reported in the semiannual monitoring reports as required by this MRP under "Reporting".

**8. Corrective Action Monitoring**

The Discharger shall conduct corrective action monitoring to demonstrate the effectiveness of corrective action in accordance with Title 27, section 20430 and this MRP.

The groundwater extraction well network is as follows:

<u>Extraction Well</u>	<u>Area Being Addressed</u>
3R	NE Corner
10R	NE Corner
HA1R	NE Corner

The Discharger shall record the volume of impacted groundwater extracted from each extraction well and report this data in the Semiannual and Annual Monitoring Reports. Reporting shall include a table showing each year the system has operated with the amount of groundwater removed from each extraction well the reporting period and the cumulative amount since groundwater extraction began (including previous extraction wells before they were replaced).

As required in the Annual Report in MRP Section B.3.h, the Discharger shall also assess the effectiveness of the corrective action program in reducing the concentration of the constituents that exceed the concentration limits in the extraction wells including graphical presentation of the data since groundwater extraction began in wells 3R, 10R, HA1R, and any other extraction wells added to the program.

**B. REPORTING**

The Discharger shall submit the following reports in accordance with the required schedule:

**Reporting Schedule**

<u>Section</u>	<u>Report</u>	<u>End of Reporting Period</u>	<u>Due Date</u>
B.1	Sampling and Analysis Plan	—	<b>15 October 2014</b>

B.2	Semiannual Monitoring Report	30 June, 31 December	<b>1 August, 1 February</b>
B.3	Annual Monitoring Report	31 December	<b>1 February</b>
B.4	Annual Impoundment Operations Report	—	<b>1 October</b>
B.5	Annual Facility Inspection Report	31 October	<b>15 November</b>
B.5	Financial Assurances Report	31 December	<b>1 June</b>

### Reporting Requirements

The Discharger shall submit monitoring reports **semiannually** with the data and information as required in this Monitoring and Reporting Program and as required in WDRs R5-2014-XXX and the Standard Provisions and Reporting Requirements (particularly Section I: “Standard Monitoring Specifications” and Section J: “Response to a Release”). 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 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, such as a computer disk.

Field and laboratory tests shall be reported in each monitoring report. Semiannual and annual monitoring reports shall be submitted to the Central Valley Water Board in accordance with the above schedule for the calendar period in which samples were taken or observations made. In addition, the Discharger shall enter all monitoring data, monitoring reports, and technical reports into the online Geotracker database as required by Division 3 of Title 27.

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

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. Such records shall be legible and 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 method detection limit (MDL) and practical quantitation limit (PQL) for each analysis. All peaks shall be reported.

### Required Reports

1. **Sampling and Analysis Plan:** By **15 October 2014**, the Discharger shall submit a Sampling and Analysis Plan (SAP) for review. The SAP shall include the following details and information: site map with all sampling points; tables with EPA analytical methods with the laboratory's method detection limits (MDLs) and practical quantitation limits (PQLs), and preservative and holding time; table with each sample location identifier (including field quality control samples) and the constituents for analysis; chain-of-custody control procedures and example forms; field shipment quality assurance/quality control procedures; and appendices with (1) example field logs, (2) sample collection procedures (e.g., low-flow, hydra-sleeve), (3) table identifying the location of the pump in comparison to the screen interval and the type of pump at each well, and (5) decontamination procedures.
2. **Semiannual Monitoring Report:** Monitoring reports shall be submitted semiannually and are due on **1 August** and **1 February**. Each semiannual monitoring report shall contain at least the following:
  - a) For each groundwater 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 used to stabilize water in the well bore before the sample is taken including the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; results of pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water;
    - 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 Sample Collection and Analysis Plan.
- b) A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
- c) The estimated quarterly groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored based upon water level elevations taken prior to the collection of the water quality data submitted in the report [Title 27, section 20415(e)(15)].
- d) Cumulative tabulated monitoring data for all monitoring points and constituents for groundwater, LCRS/leachate, unsaturated zone, surface water, and the surface impoundments. Concentrations below the laboratory reporting limit shall not be reported as "ND" unless the reporting limit is also given in the table. Otherwise they shall be reported "<" the reporting limit (e.g., <0.10). Units shall be as required in the tables for each monitored medium unless specific justification is given to report in other units. Refer to the SPRRs Section I "Standard Monitoring Specifications" for requirements regarding MDLs and PQLs.
- e) Laboratory statements of results of all analyses evaluating compliance with requirements.
- f) An evaluation of the concentration of each monitoring parameter as compared to the current concentration limits, and the results of any required verification testing for constituents exceeding a concentration limit. Report any actions taken under Section J: Response to a Release in the SPRRs for verified exceedances of a concentration limit for wells/constituents not already in corrective action monitoring.
- g) Tabulated monthly freeboard levels in the Class II surface impoundments with comparison to the freeboard requirement in the Facility Specifications of the WDRs.
- h) Tabulated monthly leakage rates into the LCRS sump with comparison to the Action Leakage Rate in the Facility Specifications of the WDRs, and a discussion of required response if ALR was exceeded.
- i) A summary of all waste discharge monitoring required in Section A.6 of this MRP.
- j) A summary of all Facility Monitoring including onsite rainfall data for the reporting period required in Section A.7 of this MRP.
- k) A summary of the status of the groundwater extraction required for the Corrective Action Program monitoring required in Section A.8 of this MRP.
- l) A discussion about the amount of dried drilling mud removed from the processing basins (Basin 8 until clean closure is completed, Basin 9 until such

time as it is only accepting dried drilling mud from other basins, and any future processing basins) during the reporting period to regain capacity.

- m) A copy of the quarterly monitoring reports submitted to Solano County pursuant to Solano County Use Permit U-89-33.

3. **Annual Monitoring Report:** The Discharger shall submit an Annual Monitoring Report to the Central Valley Water Board by **1 February** covering the reporting period of the previous monitoring year. If desired, the Annual Monitoring Report may be combined with the second semiannual report, but if so, shall clearly state that it is both a semi-annual and annual monitoring report in its title. Each Annual Monitoring Report shall contain the following additional information beyond what is required for semiannual monitoring reports:

- a) All monitoring parameters shall be graphed 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. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
- b) All historical monitoring data for which there are detectable results, including data for the previous year, shall be submitted in tabular form in a digital file format such as a computer disk. The Central Valley Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27, section 20420(h)], that facilitates periodic review by the Central Valley Water Board.
- c) Hydrographs of each well 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.
- d) 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.
- e) A written summary of the monitoring results, indicating any changes made or observed since the previous Annual Monitoring Report.
- f) The results of the annual testing of the LCRS for each double-lined Class II surface impoundment.
- g) Updated concentration limits for each monitoring parameter at each monitoring well based on the new background data set.

- h) A comprehensive discussion of the Corrective Action Program including a discussion of long-term trends in the concentrations of the pollutants in the groundwater monitoring wells and an analysis of whether the pollutants are being effectively treated. As required in MRP Section A.8, the Discharger shall report the amount of impacted groundwater extracted from each extraction well (including previous extraction wells before they were replaced). Also as required in MRP Section A.8, the Discharger shall assess the effectiveness of the corrective action program in reducing the concentration of the constituents that exceed the concentration limits in the extraction wells including graphical presentation of the data since groundwater extraction began in wells 3R, 10R, HA1R, and any other extraction wells added to the program.
4. **Annual Impoundments Operation Plan:** By **1 October** of each year, the Discharger shall submit an **Impoundments Operation Plan** for operating the surface impoundments over the upcoming 12-month period. The Annual Operations Plan shall identify the surface impoundments scheduled for accepting drilling mud/fluid and the available capacity for the upcoming 12-month period. The plan shall specify the conditions under which drilling mud will be transferred between surface impoundments (e.g., depth of solids in an impoundment, percent moisture of solids, etc.) and conditions under which liquids will be transferred between surface impoundments. Figures/schematics showing a plan view and cross-section of each active surface impoundment shall be provided. The figures/schematics shall show the total depth of the impoundment; the filling plan showing the change in depth of solids over time; the location for the discharge of waste into the surface impoundments; and the locations for drying and conditioning of solids within each surface impoundment. In addition, the planned location for pooling and evaporation of liquids shall be depicted. If solids are planned to be moved around within a surface impoundment, then this information shall be depicted on the figures/schematics.
5. **Annual Facility Inspection Report:** By **15 November** of each year, the Discharger shall submit a **Facility Inspection Report** describing the results of the inspection and the repair measures implemented, preparations for winter, and include photographs of any problem areas and the repairs. Refer to Section A.7.a. of this MRP, above.
6. **Financial Assurances Report:** By **1 June** of each year, the Discharger shall submit a report to the Central Valley Water Board that reports the balance of both the closure and corrective action funds or the amounts of the Guarantees and the adjustments to account for inflation in accordance with Title 27 Section 22236. Refer to Financial Assurances Specifications F.1 through F.6 of the WDRs.

## C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

### 1. Water Quality Protection Standard Report

For each waste management unit, the Water Quality Protection Standard (currently the approved 1 November 1998 WQPS report) shall consist of all COCs, the concentration limit for each constituent of concern, the verification retesting procedure to confirm measurably significant evidence of a release, the point of compliance, and all water quality monitoring points for each monitored medium.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the COCs, the concentration limits, and the point of compliance and all monitoring points. Any proposed changes to the Water Quality Protection Standard other than annual update of the concentration limits shall be submitted in a report for review and approval.

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 waste management 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, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with Title 27, section 20405.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).
- d. Include a proposed statistical method for calculating concentration limits for monitoring parameters and constituents of concern that are detected in 10% or greater of the background data (naturally-occurring constituents) using a statistical procedure from Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E).
- e. Include a retesting procedure to confirm or deny measurably significant evidence of a release pursuant to Title 27, section 20415(e)(8)(E) and section 20420(j)(1-3).

The Water Quality Protection Standard shall be certified by a California-registered civil engineer or geologist as meeting the requirements of Title 27. 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.

The Discharger proposed the methods for calculating concentration limits in the 1 November 1998 Water Quality Protection Standard (WQPS) report entitled *Ground Water Constituents of Concern Delineation Assessment Report*. The limits are calculated using Interwell tolerance limits at 95% confidence and 95% coverage based on background data from background monitoring well 6A.

Concentration limits shall be calculated as follows: After screening new data for trends (using Mann-Kendall and Sen's slope), outliers, seasonality, and normality, the data obtained over the previous 12-month monitoring period may be included in the proposed updated concentration limits for the following year. The formulas used to calculate the concentration limits shall be included. Calculations for the computation of all factors shall be included. A table summarizing the mean, standard deviation, factors, and new proposed concentration limit shall be included. An electronic MS Excel spreadsheet with the background monitoring data in a format suitable for statistical review by Water Board staff shall be included. In order for Water Board staff to evaluate compliance with the Water Quality Protection Standards and as a final part of the statistical analysis the Discharger shall compare the power of the statistical test method against the USEPA's reference power curve in the Unified Guidance.

The Water Quality Protection Standard shall be updated annually for each monitoring well using new and historical monitoring data.

## **2. Monitoring Parameters**

Monitoring parameters are a select group of constituents that are monitored during each monitoring event that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a waste management unit. The monitoring parameters for all waste management units are those listed in Tables 1 through 5 of this MRP.

## **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 Title 27, section 20415(e)(8); or
- b. By an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).

The methods for calculating concentration limits were included in the 1 November 1998 WQPS report. The approved method uses Interwell tolerance limits at 95% confidence and 95% coverage based on background data from background monitoring well 6A.

Concentration limits are required to be updated annually based on the new background data set (see MRP Section B.3.g. for the Annual Report, above). The most recent concentration limits for select parameters as reported in the 15 January 2014 *Second Biannual and Annual 2013 Environmental Monitoring Report* were as follows:

Constituent	Units	Concentration Limit (2013)
Electrical Conductivity	umhos/cm	1,077
pH	pH units	7.10-8.29
Total Dissolved Solids	mg/L <sup>1</sup>	594
Sulfate	mg/L	53.9
Chloride	mg/L	113.1
Arsenic	mg/L	0.0035
Barium	mg/L	0.404
Boron	mg/L	0.363
Magnesium	mg/L	51.2
Manganese	mg/L	0.014
Mercury	mg/L	>MDL
Nickel	mg/L	0.012
Potassium	mg/L	0.65
Sodium	mg/L	64.4
Zinc	mg/L	>MDL
TPH as Diesel	ug/L <sup>2</sup>	>MDL
VOCs	ug/L	>MDL
Formaldehyde	ug/L	>MDL

<sup>1</sup> Milligrams per liter  
<sup>2</sup> Micrograms per liter

The concentration limits shown above for non-naturally occurring constituents (diesel, VOCs, and formaldehyde) are set at the MDL since they should not be present in unimpacted background groundwater.

#### 4. Retesting Procedures for Confirming Evidence of a Release

If monitoring results indicate measurably significant evidence of a release, as described in Standard Monitoring Specification I.43 of the SPRRs, then:

- a. For analytes that are detected in less than 10% of the background samples (such as non-naturally occurring constituents), the Discharger shall use the non-statistical retesting procedure required in Standard Monitoring Specification I.44 of the SPRRs.

- b. For analytes that are detected in 10% or greater of the background samples (naturally occurring constituents), the Discharger shall use one of the statistical retesting procedure as required in Standard Monitoring Specification I.45 of the SPRRs.

## 5. Point of Compliance

The point of compliance for the water standard at each waste management unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the unit. The following are monitoring locations at the point of compliance:

<u>Cell or Module</u>	<u>Point of Compliance Monitoring Wells</u>
Basins 2 through 5	2R, EMP-5, EMP-6
Basins 7 through 10	7A, 8R, 11R, 12R
Future Basins 11 through 13	Future well(s) required prior to waste discharge

## 6. Compliance Period

The compliance period for each waste management 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 waste management unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program [Title 27, section 20410].

## 7. Monitoring Points

A monitoring point is a well, device, or location specified in the waste discharge requirements, which monitoring is conducted and at which the water quality protection standard applies. The monitoring points for each monitored medium are listed in Section A of this MRP.

## D. TRANSMITTAL LETTER FOR ALL REPORTS

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

by the discharger, or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate, and complete.

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

Ordered by: \_\_\_\_\_  
PAMELA C. CREEDON, Executive Officer

\_\_\_\_\_  
(Date)

WLB