

**ATTACHMENT E**  
**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD**  
**LAHONTAN REGION**

**MONITORING AND REPORTING PROGRAM**  
**NO. R6V-2014-0023**

**FOR**

**PACIFIC GAS AND ELECTRIC COMPANY**  
**GROUNDWATER REMEDIATION PROJECT**

**AGRICULTURAL TREATMENT UNITS**

**WDID NO. 6B361403002**

\_\_\_\_\_ San Bernardino County \_\_\_\_\_

California Water Code section 13267 authorizes the Regional Water Quality Control Board (Water Board) to require technical and monitoring reports. This Monitoring and Reporting Program (MRP) establishes monitoring and reporting requirements consistent with the California Water Code. This MRP applies to all agricultural treatment units (ATUs) covered under this Board Order. It includes monitoring and reporting as described in the California Environmental Quality Act (CEQA) Environmental Impact Report prepared for the PG&E Hinkley groundwater remediation project (State Clearinghouse No. 2008011097), as well as other monitoring required by this Order. Pursuant to Water California Water Code section 13223, this MRP may be amended by the Water Board Executive Officer.

**I. MONITORING**

**1. Environmental Impact Report (EIR) Monitoring**

Table E-1 describes the monitoring (or modeling) constituents, monitoring areas, frequency of monitoring, and frequency of reporting. These requirements are needed to monitor the mitigation measures for water resources impacts described in the Project's EIR. Specific monitoring areas and wells will also be proposed by the Discharger in individual Reports of Waste Discharge, and accepted by the Water Board Executive Officer in writing.

Details on all EIR mitigation measures, including implementation timing, responsibility, and standards for compliance, are included in Attachment F. Certain EIR mitigation measures are not within the Water Board's authority to require (for example, those mitigation measures related to air quality, cultural resources and biological resources); however, as CEQA lead agency the Water Board is responsible for monitoring that the Discharger has or will implement those mitigation measures that another agency should require. Therefore, as a condition of this Order, the Discharger must submit an annual report to the Water Board documenting implementation of and compliance with all applicable mitigation measures for agricultural treatment units.

**Table E-1. EIR Mitigation Monitoring for Water Resources Impacts**

<b>A. Pre-remedial Reference Level Monitoring for Water Supply Wells (WTR-MM-2b and 2c)</b>				
<b>Parameter/Constituent</b>	<b>Timing</b>	<b>Monitoring Area</b>	<b>Frequency/Duration</b>	<b>Reporting</b>
<ul style="list-style-type: none"> <li>• TDS</li> <li>• Nitrate as N</li> <li>• Uranium</li> <li>• Other Radionuclides</li> </ul>	One year prior to or concurrent with operation of new ATUs.	Water supply wells one mile downgradient and cross-gradient of any proposed new agricultural treatment unit.	Quarterly for one year.	Quarterly. Submit information in quarterly reporting to Water Board and by letter notification to individual well owners.
<ul style="list-style-type: none"> <li>• Groundwater Elevations and wetted screen depth</li> </ul>	One year prior to or concurrent with operation of new ATUs.	Water supply wells one-half mile downgradient and cross-gradient of any proposed new agricultural treatment unit.	Quarterly for one year, including monitoring in March and October.	Quarterly. Submit information in quarterly reporting to Water Board and by letter notification to individual well owners.
<ul style="list-style-type: none"> <li>• Total Chromium</li> <li>• Hexavalent Chromium</li> </ul>	One year prior to or concurrent with operation of new ATUs.	Water supply wells one-half mile downgradient and cross-gradient of any proposed new agricultural treatment unit, <u>when Cr data is not available for a water supply well.</u>	Quarterly for one year.	Quarterly. Submit information in quarterly reporting to Water Board and by letter notification to individual well owners.
<b>B. ATU Operations Monitoring for Water Supply Wells (WTR-MM-2a, 2b, 2c)</b>				
<b>Parameter/Constituent</b>	<b>Timing</b>	<b>Monitoring Area</b>	<b>Frequency/Duration</b>	<b>Reporting</b>
<ul style="list-style-type: none"> <li>• TDS</li> <li>• Nitrate as N</li> <li>• Uranium</li> <li>• Other Radionuclides</li> </ul>	Concurrent with ATU operation.	Water supply wells one-half mile downgradient and one-quarter mile cross-gradient of any proposed new ATU.	Twice yearly for duration of operation of ATU.	Twice yearly. Submit information in reporting to Water Board and by letter notification to individual well owners.
<ul style="list-style-type: none"> <li>• TDS</li> <li>• Nitrate as N</li> <li>• Uranium</li> <li>• Other Radionuclides</li> </ul>	If water supply well is "actually affected" (see WDRs section I.E.1 for criteria to determine affected wells).	Actually affected water supply well.	Once per month, until alternate water supply is provided to the satisfaction of the Water Board. Then, twice yearly if nearby monitoring wells exist.	Monthly, or twice yearly. Submit information in reporting to Water Board and by letter notification to individual well owners.
<ul style="list-style-type: none"> <li>• TDS</li> <li>• Nitrate as N</li> <li>• Uranium</li> <li>• Other Radionuclides</li> </ul>	If water supply well is "actually affected" (see WDRs section I. E.1).	Water supply wells within one-half mile downgradient and one-quarter mile cross-gradient of "actually affected" well.	Quarterly for the following two years of identification of actually affected well.	Quarterly. Submit information in reporting to Water Board and by letter notification to individual well owners.

<ul style="list-style-type: none"> <li>Total and Hexavalent Chromium</li> </ul>	Concurrent with remediation activities.	Water supply wells one mile downgradient and cross-gradient of the previously defined chromium plume boundary.	Quarterly for duration of remediation project.	Quarterly. Submit information in reporting to Water Board and by letter notification to individual well owners.
<ul style="list-style-type: none"> <li>Groundwater Elevations</li> </ul>	Concurrent with ATU operations in monitoring area.	<p>Water supply wells one-quarter mile from any ATU extraction point.</p> <p>If groundwater levels cannot be measured in water supply wells, monitoring wells between supply wells and area of remedial action may be substituted. Nearby monitoring wells may also be proposed to provide supportive data to establish elevations in supply wells where groundwater levels may fluctuate due to cycling of supply wells pumps prior to or during sampling.</p>	Twice yearly including monitoring in March and October. Continuing for duration of remedial pumping until groundwater levels have stabilized for a minimum of two years following commencement of groundwater extraction.	Twice yearly. Submit information in reporting to Water Board and by letter notification to individual well owners.
<ul style="list-style-type: none"> <li>Uranium and Gross alpha</li> <li>Arsenic</li> <li>Manganese</li> <li>Groundwater Elevations</li> </ul>	If well is actually or potentially affected by drawdown (loss of greater than 25% of wetted screen depth, see WDRs section I.E.1).	In the potentially or actually affected well, and all water supply wells within one-quarter mile of potentially or actually affected well.	Twice yearly in October and March until groundwater levels have stabilized for a minimum of two years following commencement of groundwater extraction.	Twice yearly. . Submit information in reporting to Water Board and by letter notification to individual well owners.
<b>C. Groundwater Flow, Drawdown and Contaminant Transport Modeling (WTR-MM-2a, 2b, 2c)</b>				
<b>Parameter/Constituent</b>	<b>Timing</b>	<b>Monitoring Area</b>	<b>Frequency/Duration</b>	<b>Reporting</b>
Chromium and remediation byproduct plume movement for the following three years.	Concurrent with remediation.	Project area.	Annually for duration of remediation project.	Annually Report due Jan 31
Groundwater levels in water supply wells for the following three years.	Concurrent with remediation.	Project area. Modeling based on month with greatest well water use.	Annually for duration of remediation project.	Annually Report due Jan 31

<b>D. ATU Byproduct Investigation (WTR-MM-5)</b>				
<b>Parameter/Constituent</b>	<b>Timing</b>	<b>Monitoring Area</b>	<b>Frequency/Duration</b>	<b>Reporting</b>
<ul style="list-style-type: none"> <li>• TDS</li> <li>• Uranium</li> <li>• Other Radionuclides</li> </ul>	Complete investigation within one year of WDRs approval.	<p>Monitoring wells associated with existing ATUs. See Table E-2 for specific monitoring wells.</p> <p>Extraction wells associated with existing ATUs. Grab sample of combined extracted groundwater to characterize quarterly water quality for each constituent at each ATU.</p>	<p>At a minimum, quarterly sampling data collected for one year.</p> <p>Any existing data that has been collected at least quarterly for a minimum of one year may be used for investigation purposes.</p>	<p>Within three months of investigation completion.</p> <p>Report must provide an analysis of the effects of existing ATUs on concentrations of byproducts in groundwater.</p>
<b>E. Water Rights Documentation (WTR-MM-1)</b>				
<b>Parameter/Constituent</b>	<b>Timing</b>	<b>Monitoring Area</b>	<b>Frequency/Duration</b>	<b>Reporting</b>
<p>Water rights: Discharger-owned Free Production Allowance meets or exceeds annual net remedial use.</p> <p>Estimated annual net remedial use and discharger-owned FPA.</p>	Upon expansion of ATUs over 2013 acreages.	Centro subarea, Mojave Groundwater Basin.	Annually for duration of remedial activities that involve groundwater extraction.	Annually: December 31

## 2. Groundwater Monitoring Well Sampling

The objectives of the groundwater sampling program are to assess chromium remediation effectiveness, track any ATU byproduct creation and movement, and provide advance warning for domestic wells which may be affected by remedial actions. Sample analysis methods and detection limits shall be proposed in the Report of Waste Discharge.

### a. Existing ATUs

- i. For existing ATUs, monitoring wells listed in Table E-2 shall be sampled as indicated. "Twice yearly" means two times per year. Constituents to be monitored are total and hexavalent chromium, nitrate (as N), and TDS. Uranium and other radionuclides may be required pending results of the investigation described in Table E-1, row D. Locations of existing ATUs are shown in Attachment B.
- ii. For the purposes of the investigation required by EIR mitigation measure **WTR-MM-5**, (described in Table E-1, row D, above), where agricultural byproduct data do not exist for the monitoring wells in Table E-2, those data shall be collected quarterly for a minimum of one year, and reported as specified in Table E-1, row D.
- iii. For the North and South Gorman ATUs, one new monitoring well is required by this Order at the location described in Table E-2. This well shall be installed and sampled **no later than 3 months** following the date of this Order.
- iv. When new monitoring wells are installed to evaluate the effects upon water quality from the existing ATUs, they will be added to this monitoring program.

**Table E-2. Groundwater Monitoring for Existing ATUs**

Table E-2. Groundwater Monitoring for Existing ATUs									
Desert View Dairy		North & South Gorman		Cottrell		Yang		Ranch	
Well ID#	Location (Monitoring Frequency)	Well ID#	Location	Well ID#	Location	Well ID#	Location	Well ID#	Location
DW-02	Downgradient (Quarterly)	MW-70S/D	Mid-field (Quarterly)	MW-68S/D	Downgradient (Quarterly)	MW-21A/B1	Cross gradient (Quarterly)	MW-14/B/S	Upgradient (Twice Yearly)
MW-28A/B	Upgradient (Twice yearly)	MW-84S/D	Downgradient (Quarterly)	MW-55A/S	Downgradient (Quarterly)	MW-32B1/S	Downgradient (Quarterly)	MW-22A1/B	Downgradient (Twice Yearly)
MW-29	DVD (Twice yearly)	MW-85S/D	Downgradient (Quarterly)			MW-49	Upgradient (Twice Yearly)	MW-56	Downgradient (Twice Yearly)
MW-31	DVD (Quarterly)	<b>New well</b> between MW-84 & MW-85 on Thompson Rd	Downgradient (Quarterly)			MW-88S/D	Cross gradient (Twice Yearly)	MW-27A/B	Downgradient (Twice Yearly)
MW-42B1/2	Upgradient (Twice yearly)	MW-86S/D	Upgradient (Twice Yearly)						
MW-63	DVD (Quarterly)	MW-105S/D	Downgradient (Quarterly)						
MW-71S/D	Downgradient (Quarterly)								
MW-83S/D	Downgradient (Quarterly)								
MW-89S/D	Downgradient (Quarterly)								
MW-127S1/2	Downgradient (Quarterly)								
MW-170S	Downgradient (Quarterly)								

b. New ATUs

- i. Groundwater monitoring locations for new ATUs shall be proposed by the Discharger in its Report of Waste Discharge. Groundwater monitoring well locations shall be proposed to assess chromium remediation effectiveness, track any ATU byproduct creation and movement, and provide advance warning for domestic wells which may be affected by remedial actions .
- ii. Monitoring constituents shall be total and hexavalent chromium, nitrate (as N), TDS, uranium and other radionuclides. Sample analysis methods and detection limits shall be proposed in the Report of Waste Discharge.
- iii. For compliance With EIR Mitigation Measure WTR-MM-5 and Receiving Water Limitation 3, for new ATUs in Operable Units 1 and 3, propose monitoring wells to evaluate if the discharge of waste causes a 20 percent increase in TDS concentrations. Increases will be determined by evaluating the annual average TDS concentrations for the shallow zone and deep zone of the upper aquifer, separately, for each ATU in OU1 and OU3.
- iv. For compliance with EIR Mitigation Measure WTR-MM-6 and Receiving Water Limitation 4, propose monitoring wells to evaluate if concentrations of nitrate (as N) in irrigation water results in receiving waters exceeding the criteria outlined in WTR-MM-6. The criteria outlined in WTR-MM-6 should be evaluated at individual monitoring wells beneath and downgradient of fields on a quarterly basis.
- v. For compliance with EIR Mitigation Measure WTR-MM-5 and Receiving Water Limitation 5, propose monitoring wells to evaluate if concentrations of uranium in irrigation water cause uranium levels in monitoring wells to exceed 20 picoCuries per liter (pCi/L), or to increase by more than 10 percent (if above 20 pCi/L) or by more than 20 percent compared to baseline or pre-remedial reference levels.

3. Monitoring of Irrigation Water Applied to ATUs

- i. Irrigation water applied to ATUs shall be monitored as specified in Table E-3. Samples shall be collected as grab samples of combined extracted groundwater to characterize monthly or quarterly concentrations of constituents applied to ATUs.
- ii. Groundwater volumes shall be recorded in a permanent log book at the frequency and duration specified in Table E-3, and reported quarterly.

**Table E-3. ATU Irrigation Water Monitoring**

Parameter/Constituent	Timing	Monitoring Area	Frequency/Duration	Reporting
<ul style="list-style-type: none"> <li>• Total Hexavalent and Chromium</li> </ul>	<p>Concurrent with remediation.</p>	<p>All ATUs. Grab sample of combined extracted groundwater to characterize chromium concentrations applied at each ATU.</p>	<p>Monthly for the first year of irrigation at new ATUs, followed by quarterly frequency.</p> <p>Following a significant change in discharge source at existing and new ATUs, the monitoring frequency shall be monthly for one year, followed by quarterly frequency.</p> <p>A significant change in discharge source is defined as when such change causes combined extracted groundwater samples to show a 20% increase in any constituent concentration compared to average extracted groundwater quality prior to the change in operation.</p>	<p>Quarterly</p>
<ul style="list-style-type: none"> <li>• Arsenic</li> <li>• Iron</li> <li>• Manganese</li> <li>• Total Organic Carbon</li> </ul>	<p>Concurrent with remediation.</p>	<p>ATUs in OU1 where irrigation water is extracted from within footprint of IRZ byproduct plumes. Grab sample of combined extracted groundwater to characterize quarterly water quality applied at</p>	<p>Quarterly</p>	<p>Quarterly</p>



**Table E-3. ATU Irrigation Water Monitoring**

Parameter/Constituent	Timing	Monitoring Area	Frequency/Duration	Reporting
		each ATU.		
<ul style="list-style-type: none"> <li>• Uranium</li> <li>• Total Dissolved Solids</li> <li>• Nitrate as N</li> </ul>	Concurrent with remediation.	All ATUs. Grab sample of combined extracted groundwater to characterize quarterly water quality applied at each ATU.	Quarterly	Quarterly
Volume of Extracted Groundwater: Tabulate: <ul style="list-style-type: none"> <li>• Monthly and quarterly volumes in gallons per minute per extraction well</li> <li>• Cumulative quarterly volumes in gpm for each ATU</li> <li>• Total yearly volumes of extracted groundwater in acre-feet per year.</li> </ul>	Concurrent with remediation.	All ATUs, for each extraction well and ATU as specified.	As specified (quarterly, monthly, yearly)/Project duration	Quarterly

#### 4. Soil Monitoring

Soil monitoring is required for existing and new ATUs, as specified in Table E-4. For existing fields, sample collection shall be at a rate of one sample per every 20 acres or less. For new ATUs, the Discharger shall propose soil sampling locations and numbers of samples sufficient to establish background concentrations of the constituents in Table E-4, and to investigate the accumulation (loading) of constituents in ATU soils. Sample analysis methods and detection limits shall be proposed in the Report of Waste Discharge.

**Table E-4. ATU Soil Monitoring**

Parameter/Constituent	Timing	Monitoring Area	Frequency/Duration	Reporting
<ul style="list-style-type: none"> <li>• Trivalent Chromium (insoluble salts)</li> <li>• Hexavalent Chromium</li> </ul>	Prior to application of irrigation water to ATUs in <b>OU1</b> for new ATUs, and concurrent with remediation for new and existing ATUs.	One-half foot and five feet below surface in existing and new ATUs in <b>OU1</b> .	Yearly	Yearly
<ul style="list-style-type: none"> <li>• Trivalent Chromium (insoluble salts)</li> <li>• Hexavalent Chromium</li> </ul>	Prior to application of irrigation water to ATUs in <b>OU2</b> for new ATUs, and concurrent with remediation for new and existing ATUs.	One-half foot and five feet below surface in existing and new ATUs in <b>OU2</b> .	Once every two years	Once every two years.
<ul style="list-style-type: none"> <li>• Arsenic, inorganic</li> <li>• Manganese</li> </ul>	Prior to application of irrigation water to ATUs in OU1, and concurrent with remediation.	One-half foot below surface in ATUs in OU1 where irrigation water is extracted from within footprint of IRZ byproduct plumes.	Yearly	Yearly
<ul style="list-style-type: none"> <li>• Uranium (soluble salts)</li> </ul>	Prior to application of irrigation water to new ATUs, and concurrent with remediation at all ATUs.	One-half foot below surface in all ATUs.	Twice Yearly	Twice Yearly

**5. Plant Tissue Monitoring.**

- i. Representative samples of plant or crop tissue irrigated by extracted groundwater shall be collected and analyzed as described below. For existing fields, sample collection shall be at a rate of one sample per every 20 acres or less. A sufficient number of samples shall be proposed for new ATUs to characterize plant uptake of constituents of listed in Table E-5.
- ii. Plant tissue sampling results shall be reported in milligrams per kilogram (mg/kg) dry weight of plant tissue.

<b>Table E-5. ATU Plant Tissue Monitoring</b>				
<b>Parameter/Constituent</b>	<b>Timing</b>	<b>Monitoring Area</b>	<b>Frequency/Duration</b>	<b>Reporting</b>
<ul style="list-style-type: none"> <li>• Trivalent Chromium</li> <li>• Hexavalent Chromium</li> </ul>	Concurrent with remediation.	All ATUs where hexavalent chromium in irrigation water exceeds 340 µg/L.	Twice Yearly	Twice Yearly
<ul style="list-style-type: none"> <li>• Uranium</li> <li>• Arsenic</li> </ul>	Concurrent with remediation.	ATUs where quarterly U or As exceeds MCLs in irrigation water.	Twice Yearly	Twice Yearly
•				

6. Aquifer Characteristics

For each groundwater monitoring well sampled pursuant to this Order, the following data shall be collected and reported quarterly.

<b>Table E-6. Aquifer Characteristics</b>				
<b>Parameter/Constituent</b>	<b>Timing</b>	<b>Monitoring Area</b>	<b>Frequency/Duration</b>	<b>Reporting</b>
<ul style="list-style-type: none"> <li>• Static groundwater level (feet above mean sea level)</li> <li>• Depth to groundwater (feet below ground surface)</li> <li>• Specific Conductance (micro Siemens per centimeter)</li> <li>• pH</li> <li>• Eh/ORP (millivolts)</li> <li>• Temperature (degrees C)</li> </ul>	Concurrent with remediation.	Monitoring wells in project area, as specified in Table E-2 and to be determined by annual workplans and modeling.	Quarterly.	Quarterly

## 7. ATU Condition Monitoring

On a twice-weekly basis, each ATU shall be visually inspected and the following information recorded in a permanent log book.

Table E-7. ATU Condition Monitoring				
Parameter/Constituent	Timing	Monitoring Area	Frequency/Duration	Reporting
<ul style="list-style-type: none"><li>• Runoff/drainage control facilities</li><li>• Perimeter site fencing</li><li>• Signs of runoff leaving ATU</li><li>• Presence of ponded water</li></ul>	Concurrent with remediation.	All ATUs.	Twice weekly for duration of ATU operation.	Twice yearly, include a summary of issues noted, and description of actions taken to address.

## II. AUTHORIZED WELL REHABILITATION CHEMICALS, COMPOUNDS AND TRACERS

### a) Well Chemicals and Compounds

- i. Acetic acid
- ii. Citric acid
- iii. Hydrochloric acid
- iv. Hydrogen peroxide
- v. Sodium hydroxide
- vi. Phosphoric acid
- vii. Carbon dioxide (Aqua Gard and Aqua Freed are technologies for applying carbon dioxide for well rehabilitation)
- viii. Chemicals or compounds which result in similar or less effects on water quality as compared to those previously approved. A pilot study or additional monitoring may be required for chemicals or compounds that do not have a previous history of use under similar conditions to demonstrate viii, above.
- ix. Commercial mixtures of rehabilitation compounds that carry the following certifications/registrations valid in the state of California by the NSF may be used:
  - NSF/ANSI 60-2005 (Drinking Water Treatment Chemicals – Health Effects): compounds with this certification are routinely used for rehabilitation of drinking water wells in California under the California Waterworks Standard (California Code of Regulations Title 22, Section 64590: Direct Additives).
  - NSF Nonfood Registered Compound: Compounds on this registry are acceptable for use as an ingredient in cleaning products to be used in and around food processes where not intended for direct food contact.

The Material Safety Data Sheet must be provided for any proposed chemical or compound.

### Monitoring

- i. Monitoring for well rehabilitation chemicals and compounds is required for the appropriate marker constituent for any chemical or compound used.
- ii. Monitoring wells shall be sampled for the marker constituent if they are located within 500 feet cross gradient or downgradient of a well where rehabilitation chemicals or compounds have been injected.
- iii. If the marker constituent is not detected in two consecutive quarterly sampling events, sampling for that constituent is no longer required.

## Groundwater Flow Tracers

- i. Bromide
- ii. Fluorescein
- iii. Eosine
- iv. Additional fluorescent tracers

## Monitoring

Specific monitoring for groundwater flow tracers shall be proposed in any tracer study plan submitted by the Discharger.

### **III. NUTRIENT AND IRRIGATION WATER APPLICATION AT AGRONOMIC RATES**

This Order requires application of irrigation water to ATUs at an "agronomic rate" to the extent feasible during the spring, summer, and early fall growing periods. Irrigation water may be applied to fields at greater than agronomic rates on a short-term basis (up to 4 months per year), provided that significant ponding which would attract common ravens or other potential predators of the desert tortoise does not occur. Agronomic rate refers to a rate of irrigation water applied that provides the needed amount of water and nutrient loading which grasses/crops require while minimizing excess water or nutrients percolating beyond the root zone.

Demonstration of agronomic rate application shall include the following considerations for each ATU:

- i. Irrigation Water
  - Maximizing irrigation system efficiency (for example, maximizing distribution uniformity to reach 0.85 or higher)
  - Scheduling of irrigation (amount and timing, both daily and seasonally)
  - Soil moisture and root zone water holding capacity
  - Evapotranspiration rates
  - Physical properties of soils such as soil type and structure, and percolation rate
- ii. Nutrients
  - Soil and irrigation water nutrient testing to determine amount of fertilizer needed

#### **IV. NOTIFICATIONS**

The Discharger shall notify the Water Board of any significant change in normal remedial operations within 14 calendar days of such change. Significant change means when more than 50 percent of the extraction and discharge locations are shut down, or when the total system flow rate is decreased by greater than 50 percent, or when data shows that an ATU is not being maintained by at least 50 percent in area. Normal remedial operations include variations expected with the seasons, such as maximum pumping during summer and minimum pumping during winter. The Discharger shall provide notification by telephone or e-mail correspondence if the normal or average flow rate or number of extraction locations for that time of year is significantly changed for longer than 5 consecutive days or more than half the amount of days in a calendar month. The notification shall include the reason for the operational change. Any change lasting longer than 24 hours will be reported in the quarterly monitoring reports.

A significant change in operations also includes changes which trigger ATU contingency planning to maintain hydraulic containment, in case extreme weather, crop disease, or other unforeseen events prevent groundwater extraction and irrigation of fields for an extended period (90 days or greater) such that hydraulic containment of the plume cannot be maintained.

#### **V. REPORTING**

##### **1. General Requirements**

- a. All reports shall include a transmittal letter summarizing the essential points in each report. The letter shall include a discussion of any WDR violations found since the last report was submitted, and shall describe actions taken or planned for correcting those violations. The transmittal letter shall also include a discussion of any ongoing violations of the WDRs noted in past reports, and a description and status of action(s) taken to correct those violations. If no violations have occurred since the last report, this shall be stated in the transmittal letter.
- b. The results of any analysis taken more frequently than required for the parameters and locations specified in this monitoring and reporting program shall be submitted to the Water Board in the next monitoring report.
- c. All reports shall include the signature and stamp of a California licensed professional geologist or civil engineer verifying statements in the report, laboratory and other sampling results, and work conducted at the site.



2. Reports

**Annual Reports**

The Discharger shall submit the following reports annually:

a. EIR Mitigation Measures Compliance Report

A report documenting compliance with all applicable EIR mitigation measures described in Attachment F. It is recognized that not all mitigation measures contained in Attachment F will apply to discharges or activities covered under this Order.

Compliance with the following mitigation measures must be documented in the annual report as described in Attachment F for each mitigation measure listed below. Documentation may include separate, stand-alone memoranda or reports of verification from responsible agencies, in which case the agency's receipt of those reports can be documented.

<b>Table E-8. Applicable EIR Mitigation Measures</b>			
<b>Water Resources</b>	<b>Hazardous Materials</b>	<b>Air Quality</b>	<b>Noise</b>
WTR-MM-1	HAZ-MM-1	AIR-MM-1	NOI-MM-1
WTR-MM-2	HAZ-MM-2	AIR-MM-2	
WTR-MM-2a, 2b, 2c	HAZ-MM-3	AIR-MM-3	<b>Traffic</b>
WTR-MM-5		AIR-MM-4	TRA-MM-1
WTR-MM-6		AIR-MM-5	
		AIR-MM-6	
		AIR-MM-7	
<b>Geology/Soils</b>	<b>Land Use</b>	<b>Socioeconomics</b>	<b>Aesthetics</b>
GEO-MM-2	LU-MM-1	SE-MM-1	AES-MM-1
	LU-MM-2		AES-MM-2
			AES-MM-3
<b>Biological Resources</b>	<b>Biological Resources</b>	<b>Biological Resources</b>	<b>Cultural Resources</b>
BIO-MM-1a	BIO-MM-1i	BIO-MM-2	CUL-MM-1
BIO-MM-1b	BIO-MM-1j	BIO-MM-3	CUL-MM-2
BIO-MM-1c	BIO-MM-1k	BIO-MM-4	CUL-MM-3
BIO-MM-1d	BIO-MM-1l		CUL-MM-4
BIO-MM-1e	BIO-MM-1m		CUL-MM-5
BIO-MM-1f	BIO-MM-1n		CUL-MM-6
BIO-MM-1g	BIO-MM-1o		CUL-MM-7
BIO-MM-1h	BIO-MM-1p		CUL-MM-8

b. Agronomic Rate Performance Report

An agronomic rate performance report, containing, at a minimum, the information outlined in section III, above. The report should discuss length of time water was applied at greater than agronomic rates; the reason for such application; the duration and areal extent of significant ponding; and any observations of increased raven or other predatory bird populations.

**Quarterly Reports**

1. Monitoring for existing and new ATUs shall be reported as specified in Tables E-1 through E-7. The reports shall contain where applicable, the following information:
  - a. Description of and as-built maps and designs for new fields, structures, etc. Describe acreage, number of extraction wells, and manner and method of irrigation. Describe when irrigation began and rate of application. State whether significant ponding occurred on fields and, if so, length of time of ponding.
  - b. Overall description of all operating fields, including any significant ponding occurrences. Provide the range and total volume of effluent discharged as irrigation.
  - c. Description of aquifer characteristics and state changes or variations from the previous monitoring event.
  - d. Description of and tabulation of monthly discharge volume for each agricultural treatment units for that quarter and over the previous 12 months. The new information shall be added to a table of historical data. Cite changes or variations in volumes or extraction flowrates from the same season in the previous year, as well as the previous monitoring event. If the volume extracted or flowrate from an ATU field is less than 50 percent of the same season in the previous year, provide reasoning and corrective measures, if needed to maintain plume capture. State how reduced operation affected effective of chromium plume containment and chromium remediation.
  - e. Description of other discharges to agricultural treatment units, such as tracers or well rehabilitation chemicals. Provide the volume, duration, and location of discharge, and manner of application.
  - f. Description of sampling conducted and laboratory analytical results of samples collected from the agricultural treatment units during the reporting period. The results of sample analysis of monitoring parameters for the effluent water samples shall be described and reported in tabular and graphic form. Each graph prepared for ground water data shall be plotted with raw data at a scale appropriate to show trends or variations in water quality. For graphs showing the trends of similar constituents, the scale shall be the same.

- g. For domestic well monitoring specified in Table E-1, rows A and B, include copies of notification letters of results provided to well owners, including where applicable, clear comparisons of recent results to pre-remedial reference levels. Current results must also be compared to State and Federal MCLs, and criteria to determine actually affected wells for remedial byproducts, chromium, and groundwater drawdown. Notification letters must include a clear tabulation of analytical results of current and historical data.
- h. For WTR-MM-2c, when a domestic or agricultural well is actually affected by groundwater drawdown due to remedial activities, if the Discharger demonstrates that the well remains capable of providing an adequate flow rate for domestic or agricultural supply, the well owner must concur with such demonstration in writing. The well owner's written concurrence must be submitted with applicable quarterly reports.
- i. The results of soil and plant tissue sampling conducted at the frequency and in accordance with Tables E-4 and E-5, above. Describe analytical results, whether results are changes from the previous monitoring event, and comparison to historical data or pre-remedial levels (for soil). For soil monitoring results for uranium, evaluate whether data indicates a statistically significant increasing trend from baseline conditions using appropriate statistical methods. New information shall be added to a table of historical data.
- j. The table containing analytical results for groundwater monitoring wells shall show the range and average concentrations of total chromium, hexavalent chromium, nitrate (as N), and TDS from all required groundwater monitoring wells for that quarter and over the previous 12 months. The new information shall be added to a table of historical data. Data should be summarized by Operable Unit, and by ATU field.
- k. All maps shall have a font size of no less than 9 points and show the following information: scale, legend, field names, all well locations (monitoring, extraction, domestic, etc.), other sampling locations, street names, and chromium plume lines for hexavalent and total chromium out to 3.1/3.2 µg/L, 10 µg/L, 50 µg/L, 100 µg/L, and 1,000 µg/L. The following maps shall be included in each report:
- Potentiometric map for upper aquifer.
  - Groundwater sampling results from monitoring and other wells. Draw isoconcentration lines for nitrate (as N) and TDS. Uranium results may be presented as dot maps or other graphic display to indicate the magnitude of concentration.
  - Soil sampling locations (when soil samples are collected).
  - Plant tissue sampling locations (when plant samples are collected).

Ordered by:

  
Patty Z. Kouyoumdjian  
EXECUTIVE OFFICER

March 19, 2014  
Date