

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION**

ORDER R5-2012-XXXX  
**ATTACHMENT B TO ORDER R5-2012-XXXX  
MONITORING AND REPORTING PROGRAM**

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER  
FOR  
DISCHARGES FROM IRRIGATED LANDS WITHIN THE CENTRAL VALLEY REGION  
FOR DISCHARGERS NOT PARTICIPATING IN A THIRD-PARTY GROUP

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## I. Introduction

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code (Water Code) section 13267 which authorizes the California Regional Water Quality Control Board, Central Valley Region (hereafter Central Valley Water Board), to require preparation and submittal of technical and monitoring reports. This MRP establishes specific surface and ground water monitoring and reporting requirements for individual irrigated lands owners and/or operators (Dischargers) subject to and enrolled under Waste Discharge Requirements General Order for Growers within the Central Valley Watershed that are not participating in a Third-Party Group, Order R5-2012-XXXX (hereafter referred to as the "Order"). The requirements of this MRP are necessary to monitor Discharger compliance with the provisions of the Order and determine whether state waters accepting discharges from Dischargers are meeting water quality objectives. Additional discussion and rationale for this MRP's requirements are provided in Attachment A to the Order.

## II. General Provisions

Monitoring data collected to meet the requirements of the Order must be collected and analyzed in a manner that assures the quality of the data.

To the extent feasible, all technical reports required by this MRP must be submitted electronically using the Geotracker ESI (Electronic Submittal of Information) system. Geotracker ESI is a web-based electronic reporting tool maintained by the State Water Board. The system may be accessed at: [http://www.waterboards.ca.gov/ust/electronic\\_submittal/](http://www.waterboards.ca.gov/ust/electronic_submittal/). If unable to submit the report electronically, the grower shall mail or personally deliver the report to the Central Valley Water Board.

This MRP Order becomes effective on DATE. The Central Valley Water Board Executive Officer may revise this MRP as necessary. Upon the effective date of this MRP, the Discharger shall implement the following monitoring and reporting.

## III. Monitoring Requirements

### A. General Monitoring Requirements

1. Dischargers must follow sampling and analytical procedures approved by the Executive Officer. Sample collection and analytical procedure requirements are included in Appendix MRP-1 of this Order. A Discharger may submit alternative procedures for consideration, but must receive written approval from the Executive Officer before using them.
2. If conditions are not safe for sampling, the Discharger must provide documentation of why samples could not be collected and analyzed (e.g., photo documentation). For example, the Discharger may be unable to collect samples during dangerous weather conditions. However, once the dangerous conditions have passed, the Discharger shall collect a sample of the discharge or, if the discharge has ceased, from the next discharge event.

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3. The location of discharge sampling points, along with the rationale for their selection shall be included in the Farm Water Quality Plan (FWQP).
4. The Discharger shall use clean sample containers and sample handling, storage, and preservation methods that are accepted or recommended by the selected analytical laboratory or, as appropriate, in accordance with approved United States Environmental Protection Agency analytical methods.
5. All samples collected shall be representative of the volume and nature of the material being sampled.
6. All sample containers shall be labeled with a unique identifier (e.g., field/well number) and records maintained to show the time and date of collection as well as the person collecting the sample, the sample location, and method of sample collection and preservation.
7. The Discharger shall ensure that all sample analyses are conducted by a laboratory certified for such analyses by the California Department of Public Health. These laboratory analyses shall be conducted in accordance with Title 40 Code of Federal Regulations Part 136 (*Guidelines Establishing Test Procedures for the Analysis of Pollutants*) or other test methods approved by the Executive Officer.
8. All samples collected for laboratory analyses shall be preserved and submitted to the laboratory within the required holding time appropriate for the analytical method used and the constituents analyzed.
9. All instruments and devices used by the Discharger for the monitoring program shall be properly maintained and shall be calibrated as recommended by the manufacturer and at least once annually to ensure their continued accuracy.
10. All samples submitted to a laboratory for analyses shall be identified in a properly completed and signed Chain of Custody form that should be obtained prior to sample collection from the analytical laboratory to be used.
11. Field test instruments used for pH, electrical conductivity and dissolved oxygen may be used provided:
  - a. The operator is trained in the proper use and maintenance of the instruments;
  - b. The instruments are calibrated prior to each monitoring event per manufacturer instructions and at the recommended frequency during sampling; and
  - c. Instruments are serviced per the manufacturers recommended frequency.

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## **B. Surface Water Monitoring**

The Discharger shall monitor discharges of storm water and irrigation tailwater that have the potential to reach surface waters of the state as specified in Tables 1 and 2 below, unless modified by the Executive Officer. The purpose of this monitoring is to assess the wastes in discharges from irrigated lands to surface waters and to evaluate the effectiveness of management practice implementation. Water quality is evaluated with both field-measured parameters and laboratory analytical data.

**TABLE 1. SURFACE WATER DISCHARGE MONITORING**

The following samples shall be collected each year from the irrigation and stormwater discharges of one third of the Discharger's fields.<sup>a</sup> The fields sampled shall be rotated each year, so that all fields operated by the Discharger will be sampled every three years. Sample locations must be chosen such that the samples are representative of the quality and quantity of tailwater or stormwater discharged, and at a point downgradient of water quality management practices.

***Irrigation Tailwater and Stormwater Discharges to Surface Water***

Irrigation tailwater monitoring is not required for fields with tailwater return systems, pressurized irrigation systems, or other systems that do not result in measurable tailwater discharge. Irrigation tailwater samples and stormwater discharge samples shall be collected during the first hour of discharge per the following frequency:

- D.1 First and final irrigation discharge of the growing season.
- D.2 First storm event discharge of the storm season.
- D.3 First irrigation or storm event discharge that occurs within 60-days of application of a pesticide identified in Section V. (sample is not required if there is no irrigation or stormwater discharge within 60-days of application).<sup>b</sup>
- D.4 Irrigation discharges during employment of fertigation operations.

For each sample, record date, time, location<sup>c</sup> source field(s), and ultimate destination of the discharge. Irrigation tailwater and stormwater discharge samples shall be collected and analyzed for the constituents in Table 2 (as noted: D.1, D.2, D.3, D.4).

- a. One field (or orchard, vineyard, row crop, etc.) shall be sampled for Dischargers that have one to three fields in the irrigated lands operation, two fields shall be sampled for Dischargers that have four to six fields, etc. See Attachment E for the definition of 'field'.
- b. See section V of this MRP for a list of pesticides that must be monitored.
- c. The location of sample collection shall be recorded as latitude and longitude coordinates in decimal degrees, with at least four recorded decimal places.

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<b>TABLE 2. DISCHARGE MONITORING OF TAILWATER AND STORMWATER</b>	
<b>Constituent (a)</b>	<b>Frequency (as given in Table 1)</b>
Flow or volume of discharge	D.1, D.2, D.3, D.4
Duration of discharge	D.1, D.2, D.3, D.4
Turbidity	D.1, D.2 (b)
Temperature (water)	D.4 (c)
pH	D.1, D.2, D.4 (c)
Electrical Conductivity (EC) (at 25 C)	D.1
Nitrate+nitrite (as nitrogen)	D.1, D.2, D.4
Ammonia	D.4 (d)
Fecal coliform	D.1, D.2 (e)
Pesticide(s)	D.3 (f)
a. Analytical methods, reporting limits, and reporting units are listed in Appendix MRP-1. b. When measuring effluent turbidity, upstream receiving water turbidity shall also be measured. c. For D.4 discharges, temperature and pH measurement is only required when ammonia is used. d. Required when ammonia is used in fertigation. e. Required when manure is applied within the last year. f. Pesticides that must be monitored are listed in section V of this MRP.	

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**C. Groundwater Monitoring**

1. Parties interested in coordinating or combining groundwater monitoring conducted by an individual operation or group of operations may propose an alternative monitoring program for the Executive Officer's consideration. The alternative program shall not begin until the Discharger receives written approval from the Executive Officer. Once approved, the alternative monitoring program would serve in place of the groundwater monitoring described below.
2. Beginning within six months of receipt of an NOA, the Discharger shall annually sample each domestic and agricultural supply well and subsurface (tile) drainage system present in the irrigated agricultural operation to characterize existing groundwater quality. This monitoring shall be conducted at the frequency and for the constituents specified in Table 3 below.
3. All supply wells (domestic and agricultural) must be identified with a unique identification (name/number) for the purposes of sample collection and data interpretation.

<b>Table 3. GROUNDWATER MONITORING REQUIREMENTS</b>
<p><b><i>Domestic and Agricultural Supply Wells and Subsurface (Tile) Drainage Systems</i></b></p> <p><u>Annually:</u> Field measurements of electrical conductivity.<sup>a</sup></p> <p>Laboratory analyses of nitrate+nitrite (as nitrogen).<sup>a</sup></p> <p><u>With initial annual monitoring and once every five years thereafter:</u> Laboratory analyses of general minerals<sup>b</sup> and ammonium<sup>c</sup></p> <p>6800(a) pesticides used within the previous 5-years<sup>d</sup></p>
<p>a. Analytical methods, reporting limits, and reporting units are listed in Appendix MRP-1.</p> <p>b. "General minerals" include sodium, potassium, calcium, magnesium, chloride, carbonate, bicarbonate, and sulfate.</p> <p>c. If ammonium is detected annual monitoring must be conducted for this constituent.</p> <p>d. 6800(a) pesticides are described in Title 3, section 6800(a) of the California Code of Regulations. As of the effective date of this MRP, the 6800(a) list includes atrazine, bentazon, bromacil, diuron, norflurazon, prometon, and simazine.</p>

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4. Groundwater samples from domestic wells shall be collected from the tap nearest to the pressure tank (and before the pressure tank if possible); otherwise collect samples from the tap nearest the pressure tank after water has been pumped from this tap for 10 to 20 minutes.
5. Groundwater samples from agricultural supply wells shall be collected as near as possible to the well head (installation of a sampling valve may be useful for future use). Samples shall be collected after allowing the pump to run for a minimum of 30 minutes or following evacuation of three well volumes. Samples from subsurface (tile) drains shall be collected at the discharge point into a canal or drain.
6. **Additional Groundwater Compliance Monitoring** - The Discharger must conduct additional groundwater monitoring , if the Discharger's field(s) are located within a high vulnerability area as identified in an approved Groundwater Assessment Report prepared pursuant to a third-party administered Order. The Discharger shall install monitoring wells, or use a Central Valley Water Board approved alternative technology (e.g., well point or direct push method) to collect groundwater quality samples for nitrate-nitrogen and electrical conductivity semiannually.

Prior to installation of monitoring wells, the Discharger shall submit a Monitoring Well Installation Workplan to the board for review. The workplan shall include the elements specified in Appendix MRP-2 of this MRP. Monitoring wells should not be installed until the Executive Officer approves the workplan. The Monitoring Well Installation Completion Report must be submitted in accordance with Appendix MRP-2.

In addition, the Executive Officer may require additional groundwater monitoring as described above based on an evaluation of the following vulnerability factors related to the Discharger's field(s):

- a. nitrate concentrations in the supply wells;
- b. nitrate concentrations in domestic wells adjacent to the property;
- c. location of property relative to a DPR Groundwater Protection Area;
- d. distance from an artificial recharge area as identified by the Department of Water Resources, Central Valley Water Board, or local groundwater management agency, distance between the property and the nearest off-property domestic well;
- e. distance from the property to the nearest off-property municipal well;
- f. number of crops grown per year per field;
- g. NMP completed by deadline; and
- h. annual nitrogen application versus estimated crop need.

Site specific information contained in the Discharger's Farm Water Quality Plan and/or information developed as part of any site inspections may identify additional vulnerability.

#### IV. Reporting Requirements

##### A. General Reporting Requirements

1. The results of any water quality monitoring conducted more frequently than required at the locations specified herein shall be maintained in accordance with the requirements specified in section VIII, Record Keeping Requirements, of Order R5-2012-XXXX and included in Annual Monitoring Reports.

##### B. Notice of Intent (NOI)

To apply for coverage under this Order, the Discharger must submit a completed Notice of Intent (NOI) for approval by the Executive Officer. Upon submittal of a complete NOI, the Executive Officer may issue a Notice of Applicability (NOA), after which the Discharger will be covered under this Order. The NOA will include trigger limits, TMDL load allocation requirements, and any additional monitoring requirements for all applicable constituents specific to the operation. NOI forms will be available on the Central Valley Water Board Irrigated Lands Regulatory Program website.

Information required by the NOI will include landowner name(s) and contact information; operator name(s) and contact information; facility/business/farm name and type of business operation; parcel-specific information, including Assessor Parcel Roll number(s), number of acres of irrigated agriculture, county, crop type(s), and irrigation method(s); map of the operation with surface water discharge locations, tile drains, location of any potential conduits to groundwater aquifers (e.g., active, inactive, or abandoned wells; dry wells; recharge basins; ponds); and any adjacent surface water courses identified on the map; Operator Identification Number(s) issued by the county, name of permit holder, and Site ID number(s); list of pesticides that may be used onsite; name of receiving surface water course(s); and authorized signature and certification statement.

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### C. Farm Water Quality Plan (FWQP)

The General Order requires the Discharger to develop a farm-specific water quality plan. Dischargers are encouraged to work with technical service organizations such as resource conservation districts and the University of California Cooperative Extension in the development of the entire FWQP; however, a portion of the FWQP (the Nitrogen Management Plan) is required to be developed or per subsection C.5 below. The board recommends the University of California, Division of Agriculture and Natural Resources' Publication 9002 [\*The Farm Water Quality Plan\*](#)<sup>1</sup> as a reference to help complete this requirement, along with the Nitrogen Management Plan requirements provided in this MRP. However, an alternative farm water quality plan format (such as for a commodity-specific sustainability program) can be provided, as long as its elements meet the minimum requirements described below.

Under a FWQP, the Discharger is required to track and evaluate the farm's current management practices, and describe those practices needed or currently in use to minimize waste discharge to achieve groundwater and surface water quality protection. The Executive Officer may require additional groundwater or surface water quality monitoring to evaluate the effectiveness of the practices implemented. Additional practices/monitoring may be necessary, in an iterative process, to address water quality concerns.

FWQPs shall be maintained onsite by the Discharger and available for Central Valley Water Board inspection upon request. To the extent feasible, the FWQP must be submitted electronically using the Geotracker ESI (Electronic Submittal of Information) system. The FWQP shall be maintained and updated as needed or if the Executive Officer requests that additional information be included.

The Farm Water Quality Plan shall include, at a minimum:

1. Description of the operation, including number of irrigated acres, crops;
2. Pesticides that may be applied, recommended rates, and practices associated with the pesticides that could affect the discharge of pesticides to surface or groundwater, such as application methods and irrigation related practices;
3. Map(s) (NOI map may be used) showing the location of irrigated production areas, discharge points to surface waters, surface water bodies, location of any potential conduits to groundwater aquifers (e.g., active, inactive, or abandoned wells; dry wells; recharge basins; ponds), water quality sampling locations;
4. Rationale for the water quality sampling locations;
5. Water quality management practices used or to be used (if planned, include timetable for implementation) to comply with the Order and reduce or eliminate discharge of waste to groundwater and surface waters. As described in the Order, the following are the farm water quality management standards that must be achieved:
  - a. Minimize waste discharge offsite in surface water,
  - b. Minimize percolation of waste to groundwater,

<sup>1</sup> <http://groups.ucanr.org/wqfsconf/files/45002.pdf>

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- c. Prevent pollution and nuisance,
- d. Achieve and maintain water quality objectives and beneficial uses,
- e. Protect wellheads from surface water intrusion,
- f. Minimize or eliminate the discharge of sediment above natural background levels, and
- g. Minimize excess nutrient application relative to crop need.

6. **Farm-specific Nitrogen Management Plan:** The Nitrogen Management Plan (NMP) will be a part of the FWQP. The purpose of the nitrogen management plan is to budget for and manage the nitrogen applied, considering all sources of nitrogen, crop requirements, soil types, climate, and local conditions, in order to prevent adverse impacts to the beneficial uses of surface water and groundwater. The NMP must take the site-specific conditions into consideration in identifying steps that will be taken and practices that will be implemented to minimize nitrogen movement through surface runoff or leaching past the root zone.

The NMP must contain, at a minimum, all of the elements identified in the Natural Resource Conservation Service (NRCS), Conservation Standard for Nutrient Management (Code 590) for California. The Executive Officer may approve an alternative Nitrogen Management Plan template prepared by a commodity group or other organization with recognized expertise in nitrogen management of crops.

The nitrogen management plan must be certified in one of the following ways:

- Self-certified by a Discharger who attends a California Department of Food and Agriculture or other Executive Officer approved training program for nitrogen plan certification. The Discharger must retain written documentation of their attendance in the training program; or
- Self-certified by the Discharger that the plan adheres to a site-specific recommendation from the Natural Resources Conservation Service (NRCS) or the University of California Cooperative Extension. The Discharger must retain written documentation of the recommendation provided; or
- Certified by a nitrogen management plan specialist. Such specialists include Professional Soil Scientists, Professional Agronomists, Crop Advisors certified by the American Society of Agronomy, or Technical Service Providers certified in nutrient management in California by the National Resource Conservation Service (NRCS).
- Certified in an alternative manner approved by the Executive Officer. Such approval will be provided based on the Executive Officer's determination that the alternative method for preparing the Nitrogen Management Plan meets the objectives and requirements of this Order.

Individual irrigated land operations must provide annual confirmation through the Annual Monitoring Report to the Central Valley Water Board that they are implementing a properly certified nitrogen management plan, and must provide the name and contact information of the certified crop advisor who prepared or certified the plan.

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**D. Surface Water Exceedance Plan (SWEP)**

The Discharger shall develop a SWEP when required by section VI.C of the Order. The SWEP shall include the following elements:

1. Constituent(s) for which the SWEP is required (constituent(s) of concern), relevant sample results, and collection dates of the exceedances that triggered development of the plan;
2. Summary of onsite sources of the constituent(s) of concern.
3. Evaluation of potential management practices that may be employed to control the sources of the constituent(s) of concern.
4. Description and justification for the proposed management practices that will be implemented upon Executive Officer approval of the SWEP to reduce the discharge of the constituent(s) of concern to levels below water quality triggers (see section VI for a discussion of water quality triggers);
5. Proposed time schedule for implementation of management practices and achieving compliance with water quality triggers. Time schedule must be consistent with section X of the Order, Time Schedule for Compliance.

Alternatively, the SWEP requirement may be satisfied by completing a technical report designed to gather information (e.g., samples, applicable studies) regarding the discharge and upstream/downstream receiving waters under varying conditions. The report must be designed to determine under limiting discharge and receiving water scenarios (e.g., maximum observed discharge concentration, high discharge flow, low receiving water flow) whether the discharge may cause or contribute to an exceedance of an applicable water quality objective for the constituent(s) of concern. The technical report shall include a discussion of the applicable water quality objective(s) for the constituent(s) of concern; and proposed 1) sample collection methods, 2) justification for selection of limiting discharge and receiving water conditions, 3) a discussion describing that the existing management practices in place to control the constituent(s) of concern and explanation of how the practices meet the requirements of the Order, and 4) a time schedule for developing the technical report.

**E. Groundwater Exceedance Plan (GWEP)**

The Discharger shall develop a GWEP when required by section VI.D of the Order. The GWEP shall include the following elements:

1. Constituent(s) for which the GWEP is required (constituent(s) of concern), relevant sample results, and collection dates of the exceedances that triggered development of the plan.
2. Summary of onsite sources of the constituent(s) of concern.
3. Evaluation of potential management practices that may be employed to control the sources of the constituent(s) of concern.
4. Description and justification for the proposed management practices that will be implemented upon Executive Officer approval of the GWEP to reduce the

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discharge of the constituent(s) of concern to achieve compliance with Groundwater Limitation II.B of the Order.

5. Proposed time schedule for implementation of management practices and achieving compliance with Groundwater Limitation II.B of the Order. Time schedule must be consistent with section X of the Order, Time Schedule for Compliance.

**F. Annual Monitoring Report (AMR)**

By 1 May of each year, for the previous annual monitoring period from 1 January through 31 December, the Discharger shall submit an Annual Monitoring Report (AMR). Where feasible, the Discharger, or authorized representative, shall submit the AMR to the Central Valley Water Board using the Geotracker ESI system.<sup>2</sup> If unable to submit the report electronically, the grower shall mail or personally deliver the AMR to the Central Valley Water Board. The AMR shall include the following sections and elements:

1. Surface water monitoring results:

Sample date
Constituent
Sample concentration result and trigger limit (see section VI below)
Indicate which results are exceedances of trigger limits
Sample collection location with latitude and longitude coordinates in decimal degrees to at least the fourth decimal place.
Receiving water body name

2. Groundwater monitoring results:

Sample date
Constituent
Sample concentration result and trigger limit
Indicate which results are exceedances of trigger limits
Sample collection location with latitude and longitude coordinates in decimal degrees to at least the fourth decimal place.
Well type (domestic, irrigation, monitoring, etc.)

3. The Discharger shall upload all groundwater monitoring results into Geotracker ESI's database system for well data and all surface water monitoring results into a database system as specified by the Executive Officer.
4. Confirmation that the Discharger is implementing a certified nitrogen management plan and the name and contact information of the certified specialist who prepared or approved the plan.
5. Report of total nitrogen applied and estimate of crop need.
6. Copies of all field sheets.
7. Copies of all laboratory certified analytical reports.

<sup>2</sup> Geotracker ESI is a web-based electronic reporting tool maintained by the State Water Board. The system may be accessed at: [http://www.waterboards.ca.gov/ust/electronic\\_submittal/](http://www.waterboards.ca.gov/ust/electronic_submittal/).

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8. For exceedances that have not triggered a SWEP, a summary of the updates to the FWQP to reduce waste discharge and prevent future exceedances consistent with the requirements of the Order.
9. Summary of the progress made towards meeting time schedules approved in any SWEPS and GWEPS.
10. Updates on pesticide use. This section shall list all pesticides used during the AMR reporting period and all planned pesticides for the next reporting period.
11. Mitigation Monitoring Report. Dischargers that implement mitigation measures specified in Attachment C to Order R5-2012-XXXX shall submit a Mitigation Monitoring Report as part of the AMR. The Mitigation Monitoring Report shall include information on the implementation of CEQA Mitigation Measures, including the mitigation measure implemented, identified potential impact the mitigation measure addressed, location of the mitigation measure [parcel number, county], and any steps taken to monitor the ongoing success of the measure.

#### V. Pesticides (Surface Water)

The following are the pesticides that are subject to surface water monitoring in accordance with the provisions in section III.B. of this MRP:

Aldicarb	Dimethoate	Paraquat dichloride
Bifenthrin	Disulfoton	Parathion-methyl
Chlorpyrifos	Diuron	Permethrin
Cyfluthrin	Esfenvalerate/Fenvalerate	Prometryn
Cyhalothrin, lambda	Fipronil	Propanil
Cypermethrin	Malathion	Simazine
Diazinon	Oryzalin	Thiobencarb
Dichlorvos	Oxyfluorfen	

#### VI. Water Quality Triggers

This Order requires that Dischargers comply with all adopted water quality objectives and established federal water quality criteria applicable to their discharges. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin* (Basin Plans) contain numeric and narrative water quality objectives applicable to surface water and groundwater within the Order's coverage area (the Central Valley region). USEPA's 1993 National Toxics Rule (NTR) and 2000 California Toxics Rule (CTR) contain water quality criteria which, when combined with Basin Plan beneficial use designations constitute numeric water quality standards.

This Order establishes water quality triggers for developing SWEPS and GWEPS. Water quality triggers are based on Basin Plan water quality objectives, some of which are site specific; and therefore difficult to apply generally across the entire Order coverage area. Consequently, this Order establishes a process for providing Dischargers with water quality triggers for surface water and groundwater. This process is initiated when the Discharger files an NOI for coverage under this Order. The Executive Officer will review the NOI and may issue an NOA, approving the Discharger's coverage under this Order. The NOA will include surface and groundwater water quality triggers and any additional monitoring requirements based on review of the NOI.

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Additional monitoring requirements will include monitoring for compliance with any applicable Basin Plan TMDLs and associated load limits.

## VII. Record-keeping Requirements

1. Records of on-site monitoring activities shall include the:
  - a. Date the observations were recorded, measurements were made, or samples were collected;
  - b. Name and signature of the individual(s) who made the observations, made and recorded the measurements, or conducted the sampling;
  - c. Location of measurements or sample collection;
  - d. Procedures used for measurements or sample collection;
  - e. Unique identifying number assigned to each sample; and
  - f. Method of sample preservation utilized.
  
2. Records of laboratory analyses shall include the:
  - a. Results for the analyses performed on the samples that were submitted;
  - b. Chain-of-custody forms used for sample transport and submission;
  - c. Form that records the date that samples were received by the laboratory and specifies the analytical tests requested;
  - d. Name, address, and phone number of the laboratory which performed the analysis;
  - e. Analytical methods used;
  - f. Date(s) analyses were performed;
  - g. Identity of individual(s) who performed the analyses or the lab manager; and
  - h. Results for the quality control/quality assurance (QA/QC) program for the analyses performed.
  
3. All records described in this section will be submitted as part of the Annual Monitoring Report.

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This Order becomes effective on DATE and remains in effect unless rescinded or revised by the Central Valley Water Board.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order and Attachments adopted by the California Regional Water Quality Control Board, Central Valley Region, on DATE.

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PAMELA C. CREEDON, Executive Officer

**APPENDIX MRP-1**  
**Analytical and Sample Collection Requirements**

Table 1. Analytical Requirements

Constituent	Analytical Method(s)	Maximum Reporting Limit	Reporting Unit
<b>General Parameters - Water</b>			
Dissolved Oxygen	SM 4500-O G	0.1	mg/L
Electrical [Specific] Conductivity at 25 ° C	EPA 9050A or EPA 120.1	100	µS/cm
Fecal coliform	SM 9221 B/E or 9223	2	MPN/100ml
Flow	field estimation	1	cfs
pH	SM 4500 H+B, EPA 150.1	0.1	pH units
Temperature	SM 2550 B	0.1	° Celsius
Turbidity	SM 2130 B or EPA 180.1	1	NTU
<b>Nutrients - Water</b>			
Ammonia, total (as N)	EPA 350 or SM4500 NH <sub>3</sub>	0.1	mg/L
Nitrate + Nitrite (as N)	EPA 300, 300.1 351.3, 353.2, or SM 4500	0.05	mg/L
<b>Pesticides - Surface Water</b>			
Aldicarb	EPA 531.1, 632M, or 8321A	0.5	µg/L
Bifenthrin	EPA 8081A, 8081BM, 8270, 1660M, 625M	0.00397	µg/L
Chlorpyrifos	EPA 8141AM, 614, 8321, 625m, or 8270	0.015	µg/L
Cyfluthrin	EPA 619, 1660M, 8081A, 8081AM, 8270M	0.002	µg/L
Cyhalothrin, lambda	“	35	µg/L
Cypermethrin	“	0.0047	µg/L
Diazinon	EPA 8141A, 614, 8321, 625m, or 8270	0.02	µg/L
Dichlorvos	“	0.1	µg/L
Dimethoate	“	0.1	µg/L
Disulfoton	“	0.05	µg/L
Diuron	EPA 8321A or 632M	0.4 / 0.005	µg/L
Esfenvalerate/Fenvalerate	EPA 1660M	0.07	µg/L
Fipronil	EPA 619M	0.14	µg/L
Malathion	EPA 8141A, 614, 8321, 625m, or 8270	0.1	µg/L
Oryzalin	EPA 632 or 632M	35	µg/L
Oxyfluorfen	EPA 8081A or 8081 AM	0.29	µg/L
Paraquat dichloride	EPA 549.1	0.5	µg/L
Parathion, Methyl	EPA 8141A, 614, 8321, 625m, or 8270	0.1	µg/L
Permethrin	EPA 8081A	0.019	µg/L
Prometryn	EPA 507, 619M, 625M	28	µg/L
Propanil	EPA 525.2, 532M, 619M	16	µg/L
Simazine	EPA 619M or 8141AM	0.05 / 0.2	µg/L
Thiobencarb	EPA 619 or 507	0.05	µg/L
<b>Pesticides - Groundwater</b>			
Atrazine	EPA 8260B	100	µg/L
Bentazon	EPA 615	18	µg/L
Bromacil	EPA 8321A or 507	0.4 / 0.5	µg/L
Diuron	EPA 8321A or 632M	0.4 / 0.005	µg/L

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Constituent	Analytical Method(s)	Maximum Reporting Limit	Reporting Unit
Norflurazon	EPA 8081A or 619M	0.05	µg/L
Prometon	EPA 619M or 625M	0.02 / 0.01	µg/L
Simazine	EPA 619M or 8141AM	0.05 / 0.2	µg/L
<b>General Minerals - Groundwater</b>			
Bicarbonate	SM 2320 B	0.1	mg/L
Calcium, total	EPA 200.7, SM 3111 B	0.05	mg/L
Carbonate	SM 2320 B	0.1	mg/L
Chloride	EPA 300	0.25	mg/L
Magnesium, total	EPA 200.7, SM 3111 B	0.02	mg/L
Potassium	EPA 200.7, 6010B, SM 3111 B	0.1	mg/L
Sodium	EPA 200.7, SM 3111 B	0.1	mg/L
Sulfate	EPA 300	0.25	mg/L

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Table 2. Measurement Quality Objectives

Group	Parameter	Requirements				
		Accuracy	Precision	Bias	Contamination	Completeness
Field Testing	Dissolved Oxygen	± 0.2 mg/L	± 0.2 or 10%	NA	NA	90%
	Temperature	± 0.1 °C	± 0.1 or 5%	NA	NA	90%
	Specific Conductivity	± 2 µS/cm	± 5%	NA	NA	90%
	pH by Meter	± 0.2 units	± 0.2 or 5%	NA	NA	90%
	Turbidity	± 1 NTU	± 10% or 0.1 %, whichever is greater	NA	NA	90%
Laboratory Analyses	Conventional constituents in water	Standard Reference Materials or LCS: 80% to 120% recovery	Laboratory duplicate, Field duplicate, and MS/MSD: RPD<25% (n/a if native concentration of either sample<RL)	Matrix spike 80% - 120% recovery	<RL for target analyte	90%
	Synthetic organic constituents, semi-volatiles & volatiles, in water and sediment	Standard Reference Materials: 70% to 130% recovery. LCS: 50% to 150% recovery	Laboratory duplicate, Field duplicate, and MS/MSD: RPD<25% (n/a if native concentration of either sample<RL)	Matrix spike 50% - 150% or control limits at ± 3 standard deviations based on actual lab data	<RL for target analyte	90%
	Bacteria/ Pathogens	Positive control 80% to 120% recovery	Laboratory duplicate: RPD<25% (n/a if native concentration of either sample<RL)	NA	No growth	90%



Table 3. Field Data Sheet Form for Surface Water Sampling

<b>Surface Water Field Data Sheet</b>		<b>Discharger:</b> _____		Page ___ of ___													
<b>Irrigated Lands Regulatory Program</b>				Date _____													
		<b>Section A</b>															
Site Name _____	Time First Sample taken _____	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 25%;">GPS Position</th> <th style="width: 25%;">Lat. (dd.ddddd)</th> <th style="width: 25%;">Long. (dd.ddddd)</th> </tr> <tr> <td>Target</td> <td></td> <td></td> </tr> <tr> <td>Actual</td> <td></td> <td></td> </tr> <tr> <td>Datum</td> <td></td> <td></td> </tr> </table>		GPS Position	Lat. (dd.ddddd)	Long. (dd.ddddd)	Target			Actual			Datum				
GPS Position	Lat. (dd.ddddd)			Long. (dd.ddddd)													
Target																	
Actual																	
Datum																	
Site Code _____	Monitoring Event _____																
Sampling Crew (first and last name) _____	Comments _____																
Wadeability YES/NO																	
<b>FIELD OBSERVATION</b>		<b>CIRCLE YOUR OBSERVATION</b>		<b>Section B</b>													
Dominant Substrate	Concrete, Cobble, Gravel, Sand, Mud, Other																
Site Odor	None, Sulfides, Sewage, Petroleum, Mixed, Other																
Other Presence	Vascular plants, Nonvascular plants, Oily sheen, Foam, Trash, Other																
Water Odor	None, Sulfides, Sewage, Petroleum, Mixed, Other																
Water Clarity	Clear (see bottom), Cloudy (>4" vis.), Murky (<4" vis.)																
Water Color	Clear, Brown, Green, Grey																
Sky Code	Clear, Partly Cloudy, Overcast, Fog, Hazy																
Precipitation	None, Foggy, Drizzle, Rain																
Precipitation (last 24 hrs)	Unknown, <1", >1", None																
Observed Flow	NA, Dry Waterbody Bed, No Observed Flow, Isolated Pool, 0.1-1 cfs, 1-5 cfs, 5-20 cfs, 20-50 cfs, 50-200 cfs, >200 cfs																
<b>FIELD MEASUREMENTS</b>		<b>Section C</b>															
	Flow (cfs)	pH	Specific Conductivity (µS/cm)	DO (mg/L)	Water Temp (°C)	Turbidity (NTU)											
Measurement																	
Instrument																	
Calibration Date																	
<b>SAMPLES COLLECTED FOR LAB ANALYSES (# of containers filled)</b>		<b>Section D</b>															
	Physical Parameters (Inorganics)	Total Organic Carbon (TOC)	Nutrients (Inorganics)	Pesticides Collected (1 L amber bottles)													
Samples																	
Duplicate																	
Blank																	
Matrix Spike																	
Total # Containers																	
Preserved Time and Conditions:																	



Table 5. Field Data Sheet for Groundwater Sampling

Groundwater Sampling Event Field Data Sheet Irrigated Lands Regulatory Program							Discharger: _____	Sample Date _____	Page _____ of _____	Sample Time _____										
Site Name: _____ Site Code: _____ Sampling Crew Names (first and last): _____							Well ID: _____ Well Type (circle one): Monitoring, Domestic, Ag Supply Weather conditions (circle one or more): Sunny, Cloudy, Rainy, Windy		<b>Section A</b>											
							<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 20%;">GPS Position</th> <th style="width: 30%;">Lat. (dd.ddddd)</th> <th style="width: 50%;">Long. (ddd.ddddd)</th> </tr> <tr> <td>Actual</td> <td></td> <td></td> </tr> <tr> <td>Datum</td> <td></td> <td></td> </tr> </table>		GPS Position	Lat. (dd.ddddd)	Long. (ddd.ddddd)	Actual			Datum					
GPS Position	Lat. (dd.ddddd)	Long. (ddd.ddddd)																		
Actual																				
Datum																				
WELL, WATER LEVEL, AND PURGE INFORMATION							Section B													
Well diameter (inside casing), inches: _____ Total casing length, ft: _____ Distance to top of casing (above ground), ft: _____ Screen interval, ft: _____ Depth measurement equipment (circle one): electric sounder, chalked tape, other: _____ Depth to water before purge (from top of casing), ft: _____ Depth to water at sample collection (from top of casing), ft: _____ Well recharge rate, gal/min: _____ Casing volume, gal: _____				Well pump active upon arrival (Y/N): _____ Purge equipment (circle one): Existing well pump, bailer, bladder pump, submersible pump, other Purge port location: _____ Micropurge/Low-flow techniques used (Y/N): _____ Casing volumes purged: _____ Time period purged, min: _____ Purge rate, gal/min: _____ Storage/Pressure tank volume, gal: _____			Observations:  Water present in recharge sources near well? (e.g. dairy pond, unlined canal, etc):  Condition of well (cracked pad, flooded, odor, etc.):													
FIELD MEASUREMENTS							Section C													
Time Start	Time Stop	Total Volume Purged	Water Level (feet)	Specific Conductance (µS/cm)	pH	DO (mg/L)	Water Temp (°C)	Turbidity (NTU)	ORP (mV)	Did well dry out?	Notes									
<i>Purge Events Data</i>																				
<i>Post-purge Data (after readings stabilize)</i>																				
SAMPLE INFORMATION							Section D													
Sample ID	Analyte(s)	Field Filtered (Y/N)	Preservative (Y/N)	Section E																
				NOTES																



Table 7. Sampling Container Volume, Initial Preservation and Holding Times for Water Samples

Parameters for Analysis in WATER Samples	Recommended Containers (all containers pre-cleaned)	Typical Sample Volume (ml)	Preservation	Maximum Holding Time (analysis must start by end of max)
<b>Conventional Constituents in Water</b>				
Alkalinity	Polyethylene bottles (see <b>1</b> below)	300 ml	Cool to 6°C and store in the dark	14 days at 6°C, dark
Chloride (Cl), Sulfate (SO <sub>4</sub> ), and Fluoride (F)	"	300 ml	"	28 days at 6°C, dark
Nitrate + Nitrite (NO <sub>3</sub> + NO <sub>2</sub> )	"	150 ml	Cool to 6°C and store in the dark. Acidify with H <sub>2</sub> SO <sub>4</sub> to pH<2	48 hours at 6°C, dark or 28 days if acidified
Total Dissolved Solids (TDS)	"	1000 ml	"	7 days at 6°C, dark
Ammonia (NH <sub>3</sub> )	"	500 ml	Cool to 6°C and store in the dark. May acidify with H <sub>2</sub> SO <sub>4</sub> to pH<2	48 hours at 4°C and in the dark or if acidified 28 days at 6°C and in the dark
Total Phosphorous (TPO <sub>4</sub> )	"	300 ml	"	28 days at 6°C, dark
Total Organic Carbon (TOC), Dissolved Organic Carbon (DOC)	"	40 ml (one vial)	Cool to 6°C and store in the dark. TOC: If analysis is to occur more than two hours after sampling, acidify with HCl or H <sub>2</sub> SO <sub>4</sub> to pH<2.	28 days at 6°C, dark
Total Suspended Solids (TSS)	"	1000 ml (two jars)	"	7 days at 6°C, dark
Hardness	200 ml polyethylene or glass bottle	200 ml (one bottle)	Cool to 6°C, dark <u>OR</u> filter and add 2 ml conc. H <sub>2</sub> SO <sub>4</sub> or HNO <sub>3</sub> to pH<2; Cool to 4°C, dark	48 hours dark at 6°C, dark 6 months at 6°C, dark
<b>Synthetic Organic Compounds in Water Samples</b>				
PESTICIDES & HERBICIDES (2) <input type="checkbox"/> Organophosphate Pesticides <input type="checkbox"/> Organochlorine Pesticides <input type="checkbox"/> Chlorinated Herbicides	1-liter amber glass bottle with Teflon lid-liner (per each sample type)	1000 ml (one container)	Cool to 6° C, dark pH 5-9	Keep at 6°C dark, up to 7 days. Extraction must be performed within the 7 days; analysis must be performed within 40 days of extraction
<b>Pathogen Testing Water Samples</b>				
Fecal Coliform	Factory-sealed, pre sterilized, disposable Whirl-pak® bags or 125 ml sterile plastic (high density polyethylene or polypropylene) container	100 ml volume sufficient for both <i>E. coli</i> and fecal coliform analyses	Sodium thiosulfate is pre-added to the containers in the laboratory (chlorine elimination). Cool to 6°C, dark.	STAT: 24 hours at 6°C, dark lab must be notified well in advance

(1) The volume of water necessary to collect in order to analyze for the above mentioned constituents is typically combined in four 1-liter polyethylene bottles, which also allows enough volume for possible re-analysis and for conducting lab spike duplicates. This is possible if the same laboratory is conducting all the above analyses; otherwise, individual volumes apply.

(2) Each sample type requires 1000 ml in a separate container.

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## Monitoring and Reporting Program R5-2012-XXXX

### Appendix MRP-2

#### Monitoring Well Installation and Sampling Plan and Monitoring Well Installation Completion Report

#### I. Introduction

The provisions of Appendix MRP-2 are set out pursuant to the Central Valley Water Board's authority under California Water Code (CWC) section 13267. The purpose and requirements of the groundwater monitoring program are set forth in Attachments A (Information Sheet) and B (Monitoring and Reporting Program Order R5-2012-XXXX) to Order R5-2012-XXXX.

Some Dischargers may be required to develop and submit a Monitoring Well Installation and Sampling Plan (MWISP) to the Executive Officer for approval prior to installation of monitoring wells. Stipulations and required elements of the MWISP are presented in section II below.

Upon completion of any monitoring wells, the Discharger shall submit to the Central Valley Water Board a Monitoring Well Installation Completion Report (MWICR) which describes the field activities performed during that phase of the work. Required elements to be included in the MWICR are presented in section III below.

#### II. Monitoring Well Installation and Sampling Plan

Prior to installation of groundwater monitoring wells, an MWISP and schedule prepared by, or under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology shall be submitted to the Central Valley Water Board for Executive Officer approval. Installation of monitoring wells shall not begin until the Executive Officer notifies the Discharger in writing that the MWISP is acceptable. The MWISP must be submitted within 180 days of notification from the Executive Officer that a monitoring well(s) must be installed (see section III.C.6 of Monitoring and Reporting Program Order R5-2012-XXXX, "MRP").

##### A. Stipulations

1. All monitoring wells shall be constructed in a manner that maintains the integrity of the monitoring well borehole and prevents the well (including the annular space outside of the well casing) from acting as a conduit for waste/contaminant transport. Each monitoring well shall be appropriately designed and constructed to enable collection of representative samples of the first encountered groundwater.
2. Where applicable, the Discharger shall follow state, county or local agency standards with respect to water wells and groundwater quality when constructing new wells, modifying existing wells, or destroying wells. Absent such standards, at a minimum, the

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Discharger shall follow the standards and guidelines described in the California Department of Water Resources' *Water Well Standards (Bulletins 74-81 & 74-90 combined)*. More stringent practices shall be implemented if needed to prevent the well from acting as a conduit for the vertical migration of waste constituents.

3. The horizontal and vertical position of each monitoring well shall be determined by a registered land surveyor or other qualified professional. The horizontal position of each monitoring well shall be measured with one-foot lateral accuracy using the North American Datum 1983 (NAD83 datum). The vertical elevations of each monitoring well, at the point where depth to groundwater shall be measured to an absolute accuracy of at least 0.5 feet and a relative accuracy between monitoring wells of 0.01 feet referenced to the North American Vertical Datum 1988 (NAVD88 datum).
4. Once the groundwater monitoring network is installed pursuant to an approved MWISP, the Discharger shall sample monitoring wells for the constituents and at the frequencies as specified in the approved RGMP. Groundwater monitoring shall include monitoring during periods of the expected highest and lowest annual water table levels and be of sufficient frequency to allow for evaluation of any seasonal variations.
5. Groundwater samples from monitoring wells shall be collected as specified in an approved MWISP and in accordance with the MRP Order R5-2012-XXXX.

#### **B. MWISP Required Elements**

At a minimum, the MWISP must contain all of the information listed below.

1. General Information:
  - a. Topographic map showing any existing nearby (about 2,000 feet) domestic, irrigation, municipal supply, and known monitoring wells, utilities, surface water bodies, drainage courses and their tributaries/destinations, and other major physical and man-made features, as reasonably known and appropriate.
  - b. Site plan showing proposed well locations, other existing wells, unused and/or abandoned wells, and major physical site structures (such as tailwater retention systems, tile-drainage systems including discharge points, chemigation and/or fertigation tanks, flood control features, irrigation canals, etc.).
  - c. Rationale for the number of proposed monitoring wells, their locations and depths, and identification of anticipated depth to groundwater. This information must include an explanation of how the location, number, and depths of wells proposed will result in the collection of data that can be used to assess groundwater at farms not directly monitored by the representative monitoring programs monitoring network and under a variety of hydrogeologic conditions.
  - d. Local permitting information (as required for drilling, well seals, boring/well abandonment).

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- e. Drilling details, including methods and types of equipment for drilling and soils logging activities. Equipment decontamination procedures (as appropriate) should be described.
    - f. Health and Safety Plan.
  2. Proposed Drilling Details:
    - a. Drilling techniques.
    - b. Well/soil sample collection and logging method(s).
  3. Proposed Monitoring Well Design - all proposed well construction information must be displayed on a construction diagram or schematic. For items f. through i., the vertical location of all annual materials (filter pack, seals, etc.) shall be shown and a description of the material and its method of emplacement given. The construction diagram or schematic shall accurately identify the following:
    - a. Well depth.
    - b. Borehole depth and diameter.
    - c. Well construction materials.
    - d. Casing material and diameter - include conductor casing, if appropriate.
    - e. Location and length of perforation interval, size of perforations, and rationale.
    - f. Location and thickness of filter pack, type and size of filter pack material, and rationale.
    - g. Location, thickness, and composition of any intermediate seal.
    - h. Location, thickness, and composition of annular seal.
    - i. Surface seal depth and composition.
    - j. Type of well cap(s).
    - k. Type of well surface completion.
    - l. Well protection devices (such as below-grade water-tight vaults, locking steel monument, bollards, etc.).
  4. Proposed Monitoring Well Development:
    - a. Schedule for development (not less than 48 hours or more than 10 days after well completion).

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- b. Method of development.
  - c. Method of determining when development is complete.
  - d. Parameters to be monitored during development.
5. Proposed Surveying:
- a. How horizontal and vertical position of each monitoring well will be determined.
  - b. The accuracy of horizontal and vertical measurements to be obtained.
6. Proposed Groundwater Monitoring: refer to Monitoring and Reporting Program Order R5-2012-XXXX and Appendix MRP-1.

### III. Monitoring Well Installation Completion Report (MWICR)

Within 60 days after completion of any monitoring well network, the Discharger shall submit to the Executive Officer a Monitoring Well Installation Completion Report (MWICR) prepared by, or under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology. In cases where monitoring wells are completed in phases or completion of the network is delayed for any reason, monitoring well construction data are to be submitted within 90 days of well completion, even if this requires submittal of multiple reports. At a minimum, the MWICR shall summarize the field activities as described below.

1. General Information:
- a. Brief overview of field activities including well installation summary (such as number, depths), and description and resolution of difficulties encountered during field program.
  - b. A site plan depicting the positions of the newly installed monitoring wells, other existing wells, unused and/or abandoned wells, and major physical site structures (such as tailwater retention systems, tile-drainage systems including discharge points, chemigation and/or fertigation holding tanks, flood control features, irrigation canals, etc.).
  - c. Period of field activities and milestone events (e.g., distinguish between dates of well installation, development, and sampling).
2. Monitoring Well Construction:
- a. Number and depths of monitoring wells installed.
  - b. Monitoring well identification (i.e., numbers).
  - c. Date(s) of drilling and well installation.

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- d. Description of monitoring well locations including field-implemented changes (from proposed locations) due to physical obstacles or safety hazards.
- e. Description of drilling and construction, including equipment, methods, and difficulties encountered (such as hole collapse, lost circulation, need for fishing).
- f. Name of drilling company, driller, and logger (site geologist/engineer to be identified).
- g. As-builts for each monitoring well with the following details:
  - i. Well identification.
  - ii. Total borehole and well depth.
  - iii. Date of installation.
  - iv. Boring diameter.
  - v. Casing material and diameter (include conductor casing, if appropriate).
  - vi. Location and thickness of slotted casing, perforation size.
  - vii. Location, thickness, type, and size of filter pack.
  - viii. Location, thickness, and composition of any intermediate seal.
  - ix. Location, thickness, and composition of annular seal.
  - x. Surface seal depth and composition.
  - xi. Type of well cap.
  - xii. Type of surface completion.
  - xiii. Depth to water (note any rises in water level from initial measurement) and date of measurement.
  - xiv. Well protection device (such as below-grade water-tight vaults, stovepipe, bollards, etc.).
  - xv. Lithologic log and electric log (if conducted) of well borings
  - xvi. Results of all soil tests (e.g., grain size, permeability, etc.)
- h. All depth to groundwater measurements during field program.

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- i. Field notes from drilling and installation activities (e.g., subcontractor dailies, as appropriate).
  - j. Construction summary table of pertinent information such as date of installation, well depth, casing diameter, screen interval, bentonite seal interval, and well elevation.
3. Monitoring Well Development:
- a. Date(s) and time of development.
  - b. Name of developer.
  - c. Method of development.
  - d. Methods used to identify completion of development.
  - e. Development log: volume of water purged and measurements of temperature, pH, electrical conductivity, and any other parameters measured during and after development.
  - f. Disposition of development water.
  - g. Field notes (such as bailing to dryness, recovery time, number of development cycles).
4. Monitoring Well Survey:
- a. Identify coordinate system or reference points used.
  - b. Description of measuring points (e.g., ground surface, top of casing, etc.).
  - c. Horizontal and vertical coordinates of well casing with cap removed (measuring point where water levels are measured to nearest  $\pm 0.01$  foot).
  - d. Name, license number, and signature of California licensed professional who conducted survey.
  - e. Surveyor's field notes.
  - f. Tabulated survey data.

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