CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2013-XXXX
ATTACHMENT B TO ORDER R5-2013-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 groundwater monitoring and reporting requirements for individual irrigated lands owners and/or operators (Dischargers) subject to and enrolled under Waste Discharge Requirements General Order for Discharges from Irrigated Lands within the Central Valley Region for Dischargers not participating in a Third-Party Group, Order R5-2013-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/. If unable to submit the report electronically, the Discharger shall email, 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 Tables 1 through 3 of Appendix MRP-1 to this Order. Dischargers are also required to use Forms 1 through 3 of Appendix MRP-1 to this Order. A Discharger may submit alternative procedures and forms for consideration, but must receive written approval from the Executive Officer before using them.

2. The Discharger may petition the Executive Officer to reduce surface water monitoring frequencies if, after three consecutive years of monitoring for a constituent, there are no exceedances and no trends of degradation that may threaten applicable Basin Plan beneficial uses. The monitoring reduction petition may be granted on the condition that the Discharger annually certifies (in the Annual Monitoring Report) that water quality management practices have not changed since the qualifying monitoring period on which the requested petition is based. The maximum surface water monitoring frequency reduction authorized by this section is one that reduces monitoring

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frequencies to one year of sampling for every five years. The Executive Officer may re-instate the required monitoring if an exceedance occurs, a trend of degradation that may threaten applicable Basin Plan beneficial uses is indicated by available data, or management practices change in a manner that could result in an exceedance or a trend of degradation.

3. If conditions are not safe for sampling, the Discharger must provide documentation on Forms 1 and 2 (see Appendix MRP-1) of why samples could not be collected and analyzed (e.g., photo documentation, flow measurements/estimates). 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.

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. The 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 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. Alternatively, the Discharger may use Form 4 in the attached Appendix MRP-1 as the Chain of Custody if approved by the laboratory.

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11. Field test instruments for pH, electrical conductivity, temperature, turbidity, 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.

12. All monitoring wells and supply wells (domestic and agricultural) must be identified with a unique identification (name/number) for the purposes of sample collection and data interpretation.

13. 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.

14. 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.

B. Surface Water Monitoring

1. Irrigation tailwater, stormwater and sediment toxicity monitoring

The Discharger shall monitor discharges of storm water, irrigation tailwater, and surface water channel-deposited sediments 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. The monitoring required below does not apply to surface water discharges from tile drainage systems. Tile drainage system discharge monitoring requirements are included below in section III.B.3.

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TABLE 1. SURFACE WATER DISCHARGE MONITORING

The following samples shall be collected each year from one third of the irrigation discharge points and stormwater discharge points.[a] The discharge points sampled shall be rotated each year, so that all discharge points from the Discharger's agricultural operation 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 where the irrigation system produces an effectively immeasurable[b] 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 (estimated final irrigation event) 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).[c] For each application of a pesticide identified in section V, a new 60-day monitoring window begins.

D.4 Irrigation discharges during employment of fertigation operations.

For each sample, the Discharger shall record the date, time, location,[d] 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).

Sediment Toxicity

D.5 Sediment sample during the first irrigation or storm event discharge that occurs within 60-daysof application of a pesticide identified in section VI (sample is not required if there is no irrigation or stormwater discharge within 60-days of application). This shall be carried out at each location where surface water discharges are sampled, if the appropriate sediment (i.e., silt, clay) is present at the site.[e]

a. A discharge point is defined as a location where surface water discharges leave the Discharger's property. One discharge point per year shall be sampled for Dischargers that have one to three discharge points from the irrigated lands operation, two discharge points per year shall be sampled for Dischargers that have four to six discharge points, etc.
b. An effectively immeasurable discharge includes standing water (i.e., ponding; backflow) or where the total volume discharged in a 15 minute period of time is less than what is needed to collect the necessary sample volume.
c . See section V of this MRP for a list of pesticides that must be monitored.
d. The location of sample collection shall be recorded as latitude and longitude coordinates in decimal degrees, with at least four recorded decimal places.
e. Not more than one sediment sample is required to be collected each year.

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2. Sediment toxicity testing

Sampling and analysis for sediment toxicity testing utilizing *Hyalella azteca* shall be conducted at the frequency specified in Table 1 above. The *H. azteca* sediment toxicity test endpoint is survival.

All sediment samples must be analyzed for total organic carbon (TOC) and grain size, as specified in Table 2 below. Analysis for TOC is necessary to evaluate the expected magnitude of toxicity to the test species. Note that sediment collected for grain size analysis shall not be frozen. If the sample is not toxic to the test species, the additional sample volume can be discarded.

Sediment samples that show significant toxicity to *Hyalella azteca* at the end of an acceptable test and exhibit less than 80% organism survival compared to the control will require pesticide analysis of the same sample in an effort to determine the potential cause of toxicity. The pesticide analysis must include, at a minimum, the pesticides that triggered the sediment sampling. If the pesticides used by the Discharger are detected in the sediment sample (sediment toxicity trigger), the Discharger shall conduct a surface water action plan (SWAP) and resample the receiving water or discharge channel one time per year if a surface water discharge occurs within 60-days of an application of a pyrethroid or chlorpyrifos. The annual sampling requirement shall be reduced to one sample every 5-years when the sediment toxicity trigger is not exceeded for three consecutive sampling events at the discharge/receiving water location where the sediment toxicity was initially triggered.

If the sediment toxicity sampling frequency is reduced as described above, the Discharger will continue the current, or equivalent, water quality management practices with respect to pyrethroids/chlorpyrifos use and sediment and erosion control with return sediment toxicity sampling once every 5-years. If equivalent management practices for pyrethroids/chlorpyrifos use or sediment and erosion control are discontinued, sediment toxicity monitoring reverts to the annual sampling described in Table 1. The Discharger may petition the Executive Officer to remove the sediment toxicity monitoring requirement based on information showing that employed management practices protect against sediment toxicity, e.g., practices in place result in no sediment discharge above background levels.

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TABLE 2. DISCHARGE MONITORING OF TAILWATER, STORMWATER, AND SEDIMENT TOXICITY	
Constituent (a)	**Frequency (as given in Table 1)**
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
Dissolved oxygen	D.1, D.2, D.4
Ammonia	D.4 (d)
E. coli	D.1, D.2 (e)
Pesticide(s)	D.3 (f)
Hardness (as $CaCO_3$)	D.3 (g)
Sediment toxicity to *Hyalella azteca*	D.5
Sediment Total Organic Carbon	D.5
Sediment Grain Size	D.5

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 for irrigated pasture operations, as well as any operation type where manure is applied within the last year.
f. Pesticides that must be monitored are listed in section VI of this MRP.
g. Hardness samples are only required when sampling for dissolved copper.

3. Tile drainage system discharge monitoring

Beginning within six months of issuance of an NOA, the Discharger shall sample each subsurface (tile) drainage system discharge to surface water. This monitoring shall be conducted at the frequency and for the constituents specified in Table 3 below.

TABLE 3. TILE DRAINAGE SYSTEM DISCHARGE MONITORING [a]
<u>Annually during the irrigation season</u>:
Flow rate or volume of discharge
Duration of discharge
Field measurements of electrical conductivity (at 25 °C) (μmhos/cm)
Laboratory analyses of nitrate + nitrite (as nitrogen) (mg/L)
<u>With initial annual monitoring and once every 5-years thereafter:</u>
6800(a) pesticides used within the previous 6-months [b]
a. Analytical methods, reporting limits, and reporting units are listed in Appendix MRP-1.

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TABLE 3. TILE DRAINAGE SYSTEM DISCHARGE MONITORING [a]
b. 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. Monitoring is not required for applied pesticides where the Discharger is implementing applicable DPR use requirement management practices for groundwater protection areas (CCR, Title 3, section 6487.5).

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C. Groundwater Monitoring

1. *High and low vulnerability areas - characterization of existing wells*

Beginning within six months of issuance of an NOA, the Discharger shall annually sample each domestic and agricultural supply well for two (2) years, and then once every five (5) years, to characterize existing groundwater quality. This monitoring shall be conducted during the same time of the year for the constituents specified in Table 5.

This monitoring is not required for fields with tile drainage system monitoring described in section III.B.3. This monitoring is not required for Dischargers conducting the monitoring described in the Discharger's management practices evaluation workplan proposed pursuant to section III.C.2.

Table 5. Existing well characterization monitoring [a]	
Temperature	field measurement
pH	
Dissolved oxygen	
Conductivity (at 25 ºC)	laboratory measurement
General minerals [b]	
Nitrate + nitrite as nitrogen	
Ammonium	
6800(a) pesticides used within the last 5-years [c]	
a. Analytical methods, reporting limits, and reporting units are listed in Appendix MRP-1. b. "General minerals" include sodium, potassium, calcium, magnesium, chloride, carbonate, bicarbonate, and sulfate. c. 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.	

2. *High vulnerability groundwater monitoring*

The following requirements apply if the Discharger's agricultural field is located within the Designated High Vulnerability Area[1] or within a high vulnerability area as identified in an approved Groundwater Assessment Report (GAR) prepared pursuant to a Central Valley Water Board third-party administered irrigated lands general waste discharge requirements order. Designated High Vulnerability Areas will be revised based on the results of any applicable approved GAR. The Executive Officer will provide notification to dischargers of any vulnerability change related to an approved GAR. The following

[1] For the purposes of this Order, the Designated High Vulnerability Area is comprised of the Department of Pesticide Regulation's Groundwater Protection Areas, and the State Water Resources Control Board's Hydrogeologically Vulnerable Areas. The Designated High Vulnerability Area will be revised based on the results of applicable approved third-party GARs.

requirements shall also apply to Dischargers with an exceedance of an applicable water quality objective or trigger limit in a groundwater well.

Management practices evaluation workplan
If the Discharger is located within a high vulnerability groundwater area as identified in its NOA, the Discharger shall submit a management practices evaluation workplan to the Executive Officer for review and approval within two (2) years of issuance of the NOA. Dischargers not within a high vulnerability groundwater area as identified in its NOA, but whose operation subsequently falls within a high vulnerability groundwater area shall submit a management practices evaluation workplan to the Executive Officer within one (1) year of notification from the Executive Officer. Dischargers not within a high vulnerability groundwater area with an exceedance of an applicable water quality objective/trigger limit in a well shall submit a management practices evaluation workplan to the Executive Officer within one (1) year of the exceedance. As applicable, the Discharger shall update the workplan to evaluate new management practices implemented under a groundwater action plan (per section VI.D of the Order). A new or updated workplan is required when the results of the management practices evaluation monitoring indicate existing practices are not protective of groundwater quality. Updates to the workplan shall be submitted to the Executive Officer for review and approval within 120 days of 1) Executive Officer approval of the groundwater action plan; or 2) the Executive Officer informing the Discharger that the information provided in the management practices evaluation status reports or final report indicate that existing practices are not protective of groundwater quality.

a. *Workplan Design.* The workplan shall be designed to achieve the following objectives:

- Identify whether existing management practices are protective of groundwater quality.
- Determine whether new management practices implemented in accordance with an approved groundwater action plan (as applicable) are protective of groundwater quality.
- Develop a scientifically sound estimate of the effect of the waste discharge on groundwater quality and whether the waste discharge is achieving compliance with the Order's groundwater receiving water limitation.
- Utilize the results of evaluated management practices to determine whether practices implemented need to be improved.

The workplan must include a scientifically sound approach to evaluating the effect of the Discharger's management practices on groundwater quality. The proposed approach may include:

- groundwater monitoring,
- modeling,
- vadose zone sampling, or
- other scientifically sound and technically justifiable methods for meeting the objectives of the management practices evaluation workplan.

Sufficient groundwater monitoring data should be collected or available (e.g., from other applicable studies) to confirm or validate the conclusions regarding the effect of the

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evaluated practices on groundwater quality. Any groundwater quality monitoring that is part of the workplan must be of first encountered groundwater.

b. *Groundwater quality monitoring –constituent selection.* Where groundwater quality monitoring is proposed, the management practices evaluation workplan must identify:

- the constituents to be assessed, and
- the frequency of the data collection (e.g., groundwater quality or vadose zone monitoring; soil sampling) for each constituent.

The proposed constituents must be sufficient to determine if the management practices being evaluated are protective of groundwater quality. For workplans required due to a confirmed exceedance in a monitored well, the constituent causing the exceedance and the field parameters identified in Table 4 below must be included in the proposed management practices evaluation workplan. For workplans required due to the location of the irrigated lands in a high vulnerability area, the baseline constituents for any groundwater quality monitoring must include, at a minimum, the constituents listed in Table 4.

Table 4. Constituents for management practices evaluation program monitoring [a]

Temperature	field measurement
pH	
Dissolved oxygen	
Conductivity (at 25 ºC)	laboratory measurement
General minerals [b]	
Nitrate + nitrite as nitrogen	
Ammonium	
6800(a) pesticides detected in wells and will continue to be used onsite [c]	

a. Analytical methods, reporting limits, and reporting units are listed in Appendix MRP-1.
b. "General minerals" include sodium, potassium, calcium, magnesium, chloride, carbonate, bicarbonate, and sulfate.
c. 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. Monitoring is not required for these pesticides where the Discharger is implementing applicable DPR use requirement management practices for groundwater protection areas (CCR, Title 3, section 6487.5).

c. *Workplan implementation and analysis.* The proposed workplan shall contain sufficient information/justification for the Executive Officer to evaluate the ability of the evaluation program to identify whether existing management practices and practices implemented as part of a groundwater action plan (as applicable) in combination with site conditions, are protective of groundwater quality. Upon approval of the workplan, the Discharger shall implement the workplan as approved by the Executive Officer or as approved with modifications required by the Executive Officer.

d. *Installation of monitoring wells.* Upon approval of the management practices evaluation workplan, the Discharger shall prepare and submit a Monitoring Well Installation and Sampling Plan (MWISP), if applicable. A description of the MWISP and its required

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elements/submittals are presented as Appendix MRP-2. The MWISP must be approved by the Executive Officer prior to the installation of the MWISP's associated monitoring wells.

IV. Reporting Requirements

A. General Reporting Requirements

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 R5-2013-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 and appropriate fee. Upon submittal of the appropriate fee and 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, any applicable TMDL load allocation requirements, groundwater vulnerability designation, 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.

C. Farm Water Quality Plan (FWQP)

The Order requires the Discharger to develop a farm-specific water quality plan and submit the plan to the Central Valley Water Board. Dischargers are encouraged to work with technical service organizations such as resource conservation districts, commodity groups, 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 per section IV.C.6 below. The board recommends the University of California, Division of Agriculture and Natural Resources' Publication 8332 *The Farm Water Quality Plan*[2] as a reference to help complete this requirement, along with the nitrogen management plan requirements provided in this MRP.

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

[2] http://ucce.ucdavis.edu/files/repositoryfiles/8332-54334.pdf

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monitoring to evaluate the effectiveness of the practices implemented. Additional practices/monitoring may be necessary, in an iterative process, to address water quality concerns.

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, following are the farm management performance standards that must be achieved:

   a. Minimize waste discharge offsite in surface water,
   b. Minimize percolation of waste to groundwater,
   c. Protect wellheads from surface water intrusion,
   d. Prevent pollution and nuisance,
   e. Achieve and maintain water quality objectives and beneficial uses,
   f. Minimize or eliminate the discharge of sediment above background levels, and
   g. Minimize excess nutrient application relative to crop consumption.

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 consumption, 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 should consider, to the extent appropriate, the major criteria established in the Natural Resource Conservation Service (NRCS), Conservation Standard for Nutrient Management (Code 590)[3] for California.

   For growers in a high vulnerability groundwater area, the nitrogen management plan must be certified in one of the following ways:

[3] A copy of the current version of the Conservation Standard for Nutrient Management can be found at http://efotg.sc.egov.usda.gov/references/public/WI/590.pdf

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- 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 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 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 within a high vulnerability groundwater area 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 nitrogen management plan specialist who prepared or certified the plan, if applicable.

Individual irrigated land operations that are not within a high vulnerability groundwater area must provide annual confirmation through the annual monitoring report to the Central Valley Water Board that they are implementing a nitrogen management plan.

D. Surface Water Action Plan (SWAP)

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

1. Constituent(s) for which the SWAP is required (constituent(s) of concern), relevant sample results, and collection dates of the exceedances, if applicable, that triggered development of the plan.

2. Summary of onsite sources of the constituent(s) of concern.

3. Description and justification for the proposed management practices that will be implemented to reduce the discharge of the constituent(s) of concern to address the problem triggering preparation of the SWAP.

4. Proposed monitoring plan to evaluate the effectiveness of improved management.

5. Proposed time schedule for implementation of management practices to address the problem triggering the preparation of the SWAP. Time schedule must be consistent with section X of the Order, Time Schedule for Compliance.

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Alternatively, the SWAP 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 or degradation that may threaten any applicable Basin Plan beneficial use. 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 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 Action Plan (GWAP)

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

1. Constituent(s) for which the GWAP is required (constituent(s) of concern), relevant sample results, and collection dates of the exceedances, if applicable, that triggered development of the plan.

2. Summary of onsite sources of the constituent(s) of concern.

3. Description and justification for the proposed management practices that will be implemented to reduce the discharge of the constituent(s) of concern to address the water quality problem triggering the preparation of the GWAP.

4. Proposed time schedule for implementation of management practices to address the problem triggering the preparation of the GWAP. Time schedule must be consistent with section X of the Order, Time Schedule for Compliance.

F. Management Practices Evaluation Workplan Reports

1. *Status reports*. Status reports of the management practices evaluation workplan must be submitted to the Executive Officer as part of the annual monitoring report or in a separate report due on the same date as the annual monitoring report. The report shall include all data (including analytical reports) collected by each phase of the workplan since the previous report was submitted. The report shall also contain a tabulated summary of data collected to date under the workplan, including identification of any monitoring results that triggered a groundwater action plan. Within each report, the Discharger shall evaluate the data and make a determination whether groundwater is being impacted. The report shall summarize the activities conducted under the workplan and identify the number and location of installed monitoring wells relative to each other and other types of monitoring devices.

   Each report shall also include an evaluation of whether the specific phase(s) of the workplan is/are on schedule to provide the data needed to complete the management practices evaluation report (detailed below) by the required deadline. If the evaluation concludes that information needed to complete the report may not be available by the

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required deadline, the report shall include measures that will be taken to bring the program back on schedule.

2. *Management practices evaluation final report (MPER)*. No later than six (6) years after Executive Officer approval of the management practices evaluation workplan, the Discharger shall submit, for Executive Officer approval, the final management practices evaluation report (MPER) describing whether its management practices are protective of groundwater quality. The MPER must include an adequate technical justification for the conclusions that incorporates available data and reasonable interpretations of geologic and engineering principles to identify whether management practices are protective of groundwater quality.

   The report shall include an assessment of each management practice to determine which management practices are protective of groundwater quality.

G. 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.[4] If unable to submit the report electronically through Geotracker ESI, the grower shall email, 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 VII 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.
Sample site name / code

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.)
Well name / code

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.

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[4] 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/.

4. For growers within a high vulnerability groundwater area, 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]

5. For growers within a high vulnerability groundwater area, report of total nitrogen available and estimate of crop consumption for the previous year.

6. Copies of all field sheets associated with water quality sample collection.

7. Copies of all laboratory certified analytical reports associated with water quality samples.

8. For exceedances that have not triggered a SWAP, 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 SWAPs and GWAPs.

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 R5-2013-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. This list will be reviewed and updated as necessary based on available information.

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[5] For growers not within a high vulnerability area, confirmation that the Discharger is implementing a nitrogen management plan.

2,4-D		
Aldicarb	Dimethoate	Paraquat
Atrazine	Disulfoton	Parathion-methyl
Chlorpyrifos	Diuron	Prometryn
Copper*	Malathion	Propanil
Diazinon	Oryzalin	Simazine
Dichlorvos	Oxyfluorfen	Thiobencarb

* Water quality samples collected shall be analyzed for “dissolved” copper.

VI. Pesticides (Sediment Toxicity)

The following are the pesticides that would trigger the sediment toxicity analysis requirement in accordance with the provisions of section III.B of this MRP. This list will be reviewed and updated as necessary based on available information.

Bifenthrin	Cyhalothrin, lambda	Permethrin
Chlorpyrifos	Cypermethrin	
Cyfluthrin	Esfenvalerate/Fenvalerate	

VII. 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 SWAPs and GWAPs. 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, groundwater vulnerability designation, and any additional monitoring requirements based on review of the NOI. Additional monitoring requirements will include monitoring for compliance with any applicable Basin Plan TMDLs and associated load limits.

VIII. 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;

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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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APPENDIX MRP-1
Analytical and Sample Collection Requirements

Appendix MRP-1 Table 1. Analytical Requirements			
Constituent	**Analytical Method(s)**	**Maximum Reporting Limit**	**Reporting Unit**
General Parameters - Water			
Dissolved Oxygen	SM 4500-O	0.1	mg/L
Electrical [Specific] Conductivity at 25 ° C	USEPA 9050A or 120.1	100	µS/cm
E. coli	SM 9221 B/E (MUG) or 9223	2	MPN/100ml
Flow	field estimation	1	cfs
Hardness (as $CaCO_3$)	USEPA 200.7, 130.1, 130.2, SM 2340C	10	mg/L
pH	SM 4500 H+B, AS 3778 or USEPA 150.1	0.1	pH units
Temperature	SM 2550	0.1	° Celsius
Turbidity	SM 2130B or USEPA 180.1	1	NTUs
Nutrients - Water			
Ammonia (NH_3 as N)	USEPA 350 or SM4500	0.1	mg/L
Ammonium (NH_4^+ as N)	"	0.1	mg/L
Nitrate + Nitrite (as N)	USEPA 300, 300.1 351.3, 353.2, or SM 4500	0.05	mg/L
Pesticides - Surface Water			
2,4-D			
Aldicarb	USEPA 8321 or 632	0.4	µg/L
Atrazine	USEPA 619 or 507	0.5	µg/L
Chlorpyrifos	USEPA 8141A, 614, 8321, 625m, or 8270	0.015	µg/L
Copper (dissolved)	USEPA 200.7, 200.8, 213.2, 6020, SM 3113, 3113B, or Modified USGS	0.5	µg/L
Diazinon	USEPA 8141A, 614, 8321, 625m, or 8270	0.02	µg/L
Dichlorvos	"	0.1	µg/L
Dimethoate	"	0.1	µg/L
Disulfoton (Disyton)	"	0.05	µg/L
Diuron	USEPA 8321 or 632	0.4	µg/L
Malathion	USEPA 8141A, 614, 8321, 625M, or 8270	0.1	µg/L
Oryzalin	USEPA 632 or 632M	0.4	µg/L
Oxyfluorfen	USEPA 8081A or 8081 AM	0.05	µg/L
Paraquat	USEPA 549.1	0.4	µg/L
Parathion, Methyl	USEPA 8141A, 614, 8321, 625m, or 8270	0.1	µg/L
Prometryn	USEPA 507, 619M, 625M	0.1	µg/L
Propanil	USEPA 525.2, 532M, 619M	0.05	µg/L
Simazine	USEPA 619, 8141, 625, 8270C, or 507	0.5	µg/L
Thiobencarb	USEPA 619 or 507	0.5	µg/L
Parameters - Sediment			
Toxicity to test species *Hyalella azteca*	USEPA 600/R-99/064		
Total Organic Carbon (TOC)	USEPA 415.1, USEPA 9060, Wakley Black, SW-846	200	mg/kg
Grain Size	ASTM D-422, USEPA 1995, USACE 1981	1	% sand, silt, clay, gravel

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Appendix MRP-1 Table 1. Analytical Requirements			
Constituent	**Analytical Method(s)**	**Maximum Reporting Limit**	**Reporting Unit**
Pesticides - Groundwater			
Atrazine	USEPA 619 or 507	0.5	µg/L
Bentazon	USEPA 615	0.5	µg/L
Bromacil	USEPA 8321A or 507	0.4	µg/L
Diuron	USEPA 8321A or 632M	0.4	µg/L
Norflurazon	USEPA 8081A or 619	0.05	µg/L
Prometon	USEPA 619 or 625M	0.02 / 0.01	µg/L
Simazine	USEPA 619, 8141, 625, 8270C, or 507	0.5	µg/L
General Minerals - Groundwater			
Bicarbonate	SM 2320 B	0.1	mg/L
Calcium, total	USEPA 200.7, SM 3111 B	0.05	mg/L
Carbonate	SM 2320 B	0.1	mg/L
Chloride	USEPA 300	0.25	mg/L
Magnesium, total	USEPA 200.7, SM 3111 B	0.02	mg/L
Potassium	USEPA 200.7, 6010B, SM 3111 B	0.1	mg/L
Sodium	USEPA 200.7, SM 3111 B	0.1	mg/L
Sulfate	USEPA 300	0.25	mg/L

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Appendix MRP-1 Table 2. 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)
Conventional Constituents in Water				
Alkalinity	Polyethylene bottles (see ***1*** below)	100 ml	Cool to 4°C and store in the dark	14 days at 4°C, dark
Chloride (Cl), Sulfate (SO_4), and Fluoride (F)	"	300 ml	"	28 days at 4°C, dark
Nitrate + Nitrite ($NO_3 + NO_2$) as N	"	150 ml	Cool to 4°C and store in the dark. Acidify with H_2SO_4 to pH<2	48 hours at 4°C, dark or 28 days if acidified
Total Dissolved Solids (TDS)	"	1000 ml	"	7 days at 4°C, dark
Ammonia (NH_3)	"	500 ml	Cool to 4°C and store in the dark. May acidify with H_2SO_4 to pH<2	48 hours at 4°C and in the dark or if acidified 28 days at 4°C and in the dark
Total Phosphorous (TPO_4)	"	300 ml	"	28 days at 4°C, dark
Total Organic Carbon (TOC), Dissolved Organic Carbon (DOC)	"	40 ml (one vial)	Cool to 4°C and store in the dark. TOC: If analysis is to occur more than two hours after sampling, acidify with HCl or H_2SO_4 to pH<2.	28 days at 4°C, dark
Total Suspended Solids (TSS)	"	1000 ml (two jars)	"	7 days at 4°C, dark
Hardness	200 ml polyethylene or glass bottle	200 ml (one bottle)	Cool to 4°C, dark OR filter and add 2 ml conc. H_2SO_4 or HNO_3 to pH<2; Cool to 4°C, dark	48 hours dark at 4°C, dark 6 months at 4°C, dark
Synthetic Organic Compounds in Water Samples				
PESTICIDES & HERBICIDES ***(2)*** ☐ Organophosphate Pesticides ☐ Organochlorine Pesticides ☐ Chlorinated Herbicides	1-liter amber glass bottle with Teflon lid-liner (per each sample type)	1000 ml (one container) * Each sample type requires 1000 ml in a separate container	Cool to 4° C, dark pH 5-9. If chlorine is present, add 0.1 g sodium thiosulfate	Keep at 4°C dark, up to 7 days. Extraction must be performed within the 7 days; analysis must be performed within 40 days of extraction
Pathogen Testing Water Samples				
E. coli	Factory-sealed, pre sterilized, disposable Whirl-pak® bags or 125 ml sterile plastic (high density polyethylene or polypropylene) container	100 ml volume	Sodium thiosulfate is pre-added to the containers in the laboratory (chlorine elimination). Cool to 4°C, dark.	STAT: 24 hours at 4°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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Appendix MRP-1 Table 3. Measurement Quality Objectives

Group	Parameter	Requirements			
		Accuracy	Precision	Recovery	Completeness
Field Testing	Dissolved Oxygen	± 0.2 mg/L	± 0.2 or 10%	NA	90%
	Temperature	± 0.1 °C	± 0.1 or 5%	NA	90%
	Electrical [Specific] Conductivity	± 5%	± 5%	NA	90%
	pH by Meter	± 0.2 units	± 0.2 or 5%	NA	90%
	Turbidity	± 1 NTU	± 10% or 0.1 %, whichever is greater	NA	90%
Laboratory Analyses	Conventional constituents in water	Standard Reference Materials (SRM, CRM, PT) within 95% CI stated by provider of material. If not available then with 80% to 120% of true value.	Laboratory duplicate, Blind Field duplicate, and MS/MSD ± 25% RPD if Result >10X the MDL. Laboratory duplicate minimum.	Matrix spike 80% - 120% recovery or control limits at ± 3 standard deviations based on actual lab data	90%
	Synthetic organic analytes (including pesticides)	Standard Reference Materials (SRM, CRM, PT) within 95% CI stated by provider of material. For LCS and LCSD50% to 150% of true value.	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	90%
	Bacteria/ Pathogens	Laboratory positive and negative cultures- proper positive or negative response. Bacterial PT sample --within the stated acceptance criteria.	Rlog within 3.27*mean Rlog (reference is section 9020B of 18th,19th, or 20th editions of Standard Methods	NA	90%
	Toxicity testing	Meet all performance criteria in method relative to reference toxicant.	Meet all performance criteria in method relative to sample replication.	NA	90%
	Total organic carbon in sediment and sediment grain size	CRM within the 95% CI stated by the provider. Laboratory Control Material (LCM) ± 20% to 25% of stated value. No accuracy criteria for grain size.	Duplicate within ± 20% if Result >10X the MDL	± 25% recovery (75% - 125%)	90%

Form 1. Field Data Sheet for Surface Water Sampling

Surface Water Field Data Sheet
Irrigated Lands Regulatory Program

Discharger Name:_____

Page___of
Date _____

Section A

Site Name _____
Site Code _____
Sampling Crew
(first and last name) _____

Photo numbers:_____

Wadeability YES/NO

Time First Sample taken _____
Monitoring Event _____

Comments _____

Safe for sample collection? YES / NO
Comments_____

GPS Position	Lat. (dd.ddddd)	Long. (dd.ddddd)
Target		
Actual		
Datum		

FIELD OBSERVATION **CIRCLE YOUR OBSERVATION** **Section B**

Dominant Substrate	Concrete, Cobble, Gravel, Sand, Mud, Silt, Hardpan Clay, 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

FIELD MEASUREMENTS **Section C**

	Flow (cfs)	pH	Electrical [Specific] Conductivity (µS/cm)	DO (mg/L)	Water Temp (°C)	Turbidity (NTU)	Photos (as needed)
Measurement							
Instrument							
Calibration Date							

SAMPLES COLLECTED FOR LAB ANALYSES (# of containers filled) **Section D**

	Physical Parameters (Inorganics)	Total Organic Carbon (TOC)	Nutrients (Inorganics)	Bacteria	Sediment Toxicity	Grain Size	Pesticides Collected (1 L amber bottles)			
Samples										
Duplicate										
Blank										
Matrix Spike		n/a			n/a	n/a				
Total # Containers										

Preserved Time and Conditions:

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Form 2. Discharge Field Data Sheet for Obtaining Surface Flow Measurements

Discharge Field Sheet
Irrigated Lands Regulatory Program

Discharger name:_____

Date _____
Sampling Crew _____
Site Code _____
Site Name _____
Method (Circle one) wading/ other (specify) _____
Record units of the meter on sheet _____
Comments _____
_____
Right Edge Water (REW) _____
Left Edge Water (LEW) _____
Total Width _____
Start Time (24 hr) _____
Ending Time (24 hr) _____
Spin Test (# Sec) _____

Number of Measurements	Angle (if taken from bridge)	Numbers on measuring tape (in meters/feet)	Observation depth from water surface (0.2, 0.6, 0.8)	Revolutions/ Velocity

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Form 3. Field Data Sheet for Groundwater Sampling

Groundwater Sampling Event Field Data Sheet **Page_____ of_____**
Irrigated Lands Regulatory Program **Discharger name: _____** **Sample Date_____** **Sample Time_____**

Section A

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

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 (e.g., 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
Purge Events Data											
Post-purge Data (after readings stabilize)											

SAMPLE INFORMATION

Section D

Sample ID	Analyte(s)	Field Filtered (Y/N)	Preservative (Y/N)

NOTES

Section E

TENTATIVE

Form 4. REQUEST FOR ANALYSIS AND CHAIN OF CUSTODY RECORD

Page___ of_____

Name (Customer)	Send Results To	Batch ID
Address (Customer)		Lab Storage (Refrigerator or freezer number)
City	Phone Number	
Ice Chest Temperature at Log-In	Analysis Requested	

Sample Identification	Collection		Physical Parameters	Nutrients	Pathogens	Trace Elements	Hardness	Sediment Toxicity	TOC	Others (specify)	OCH Pesticides	OP Pesticides	Pyrethroids	Carbamates	Herbicides (specify)	Others (specify)	Number of Containers			
	Date	Time															Plastic	Glass	Vial	Whirlpak

Comments/Special Instructions

Samples Relinquished By (signature)	Print Name	Date	Received By (signature)	Print Name	Date

Monitoring and Reporting Program R5-2013-XXXX

APPENDIX MRP-2

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

TENTATIVE

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 R5-2013-XXXX) to Order R5-2013-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.

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 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 management practices evaluation workplan. 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 R5-2013-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).

   e. Drilling details, including methods and types of equipment for drilling and soils logging activities. Equipment decontamination procedures (as appropriate) should be described.

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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).

   b. Method of development.

   c. Method of determining when development is complete.

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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 R5-2013-XXXX.

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.

   d. Description of monitoring well locations including field-implemented changes (from proposed locations) due to physical obstacles or safety hazards.

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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.

i. Field notes from drilling and installation activities (e.g., subcontractor dailies, as appropriate).

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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 a 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 ± 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.

TENTATIVE