

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

MONITORING AND REPORTING PROGRAM R5-2022-0822  
FOR  
AQUIFER STORAGE AND RECOVER PROJECTS  
THAT INJECT DRINKING WATER INTO GROUNDWATER  
SACRAMENTO COUNTY WATER AGENCY  
AQUIFER STORAGE AND RECOVERY PILOT TEST AT PW-1  
SACRAMENTO COUNTY

This Monitoring and Reporting Program (MRP) allows determination of the potential for groundwater degradation and incorporates requirements for monitoring of injected water and groundwater for the Aquifer Storage and Recovery (ASR) Pilot Test at PW-1 located at Sacramento County Water Agency's Vineyard Surface Water Treatment Plant. This MRP is issued pursuant to Water Code Section 13267. The Permittee shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. As appropriate, California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) staff shall approve specific sample station locations prior to implementation of sampling activities.

Section 13267 of the California Water Code states, in part:

*"In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports."*

Section 13268 of the California Water Code states, in part:

*"(a) Any person failing or refusing to furnish technical or monitoring program reports as required by subdivision (b) of Section 13267, or failing or refusing to furnish a statement of compliance as required by subdivision (b) of Section 13399.2, or falsifying and information provided therein, is guilty of a misdemeanor and may be liable civilly in accordance with subdivision (b).*

*(b)(1) Civil liability may be administratively imposed by a regional board in accordance with Article 2.5 (commencing with section 13323) of Chapter 5 for a violation of subdivision (a) in an amount which shall not exceed one thousand dollars (\$1,000) for each day in which the violation occurs."*

All samples should be representative of the volume and nature of the monitored medium. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form.

Field test instruments (such as those used to monitor pH) may be used provided that:

1. The operator is trained in the proper use of the instrument;
2. The instruments are field calibrated prior to each use;
3. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in the “Reporting” section of this MRP.

### **INJECTION WELL MONITORING**

The injection well (PW-1) shall be monitored when water is being injected into the aquifer. Monitoring of the injection well shall include, at a minimum, the following shown in the table below. Injection activity shall be recorded on a daily basis.

**Table 1 – Injection Well Monitoring**

<b>Constituent/Parameter</b>	<b>Units</b>	<b>Type of Sample</b>	<b>Sampling Frequency</b>
Depth to groundwater	0.01 feet	Measured	Daily
Daily Average Injection Rate	gpm	Meter	Continuous per injection and recharge event
Injected Water, cumulative total for year to date	ac-ft/yr	Meter	Continuous per injection and recharge event
Extracted Water, cumulative total for year to date	ac-ft/yr	Meter	Continuous per injection and recharge event

### **INJECTED WATER MONITORING**

Injected water is limited to potable water from SWCA’s Vineyard Surface Water Treatment Plant, which is produced through SWCA’s California Department of Public Health (CDPH) permitted domestic water supply permit. Section 116470 of the California Health and Safety Code requires:

1. An Annual Water Quality Report (AWQR), which characterizes the injected water.
2. Public water systems that serve more than 10,000 service connections and that detect one or more contaminants in drinking water that exceed the applicable public health goal, are required to prepare a report that addresses the contaminant issue.

Both reports shall be submitted as part of the Technical Addendum to be submitted at the completion of the pilot test.

Additionally, potable water used as injected water shall be monitored during periods when injection is occurring. See Figure 1 (Technical Report, September 2021) below, for proposed sample collection anticipated during the ASR pilot test. Monitoring of the injected water shall include at least the following as shown in the table below.

**Table 2 – Injected Water Monitoring**

<b>Constituent</b>	<b>Unit</b>	<b>Type of Sample</b>
pH	pH units	Grab
Electrical Conductivity	µmhos/cm	Grab
Total Dissolved Solids	mg/L	Grab
Dissolved Organic Carbon	mg/L	Grab
Total Organic Carbon	mg/L	Grab
Nitrate (as Nitrogen)	mg/L	Grab
Calcium	mg/L	Grab
Magnesium	mg/L	Grab
Sodium	mg/L	Grab
Potassium	mg/L	Grab
Alkalinity (HCO <sub>3</sub> , CO <sub>3</sub> , OH)	mg/L	Grab
Bicarbonate	mg/L	Grab
Carbonate	mg/L	Grab
Chloride	mg/L	Grab
Sulfate	mg/L	Grab
Fluoride	mg/L	Grab
Arsenic	µg/L	Grab
Iron – total	µg/L	Grab
Manganese - total	µg/L	Grab
Chlorine Residual (free)	mg/L	Grab
Total Trihalomethanes	mg/L	Grab
Bromodichloromethane	mg/L	Grab
Dibromochloromethane	mg/L	Grab
Bromoform	mg/L	Grab
Chloroform	mg/L	Grab
Total Haloacetic Acids	mg/L	Grab
Monobromoacetic Acid	mg/L	Grab
Monochloroacetic Acid	mg/L	Grab
Bromochloroacetic Acid	mg/L	Grab
Dibromoacetic Acid	mg/L	Grab
Trichloroacetic Acid	mg/L	Grab

**Figure 1**

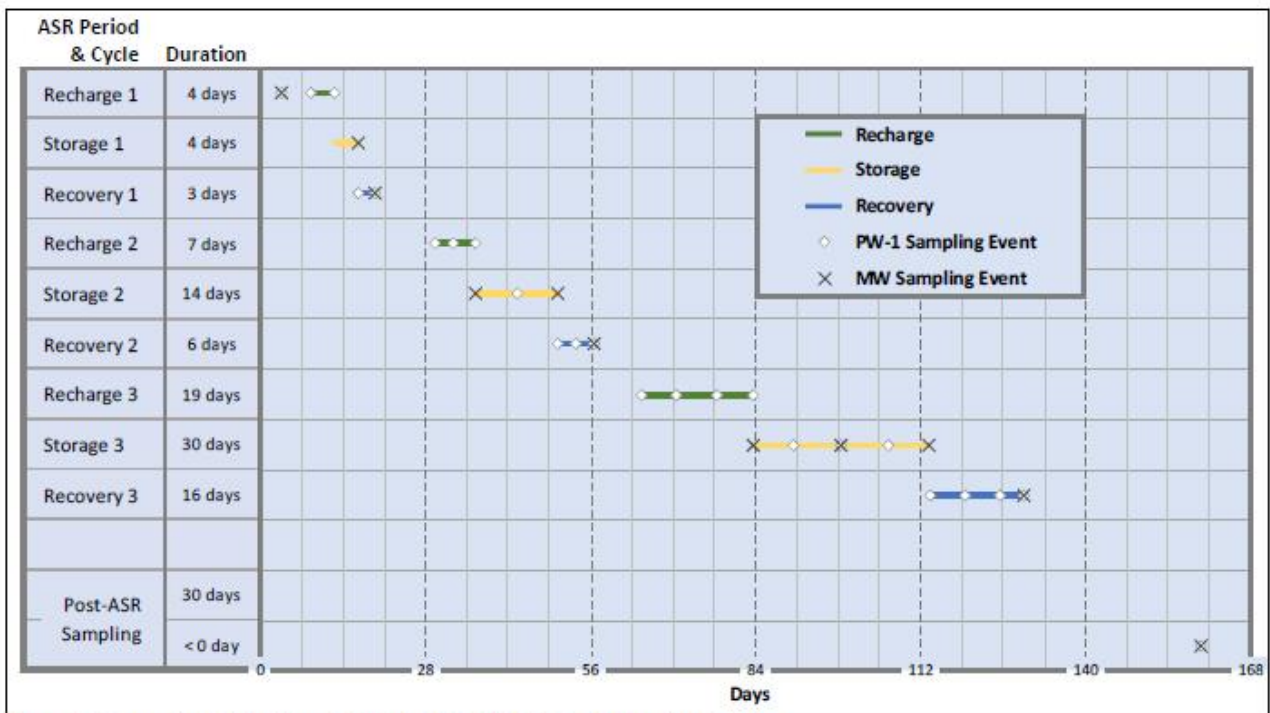


Figure 1. Approximate Duration of 3-Cycle ASR Pilot Test and Sampling Events

**EXTRACTION MONITORING**

Monitoring of extraction from well PW-1 shall include at least the following as shown in the table and meet the following requirements below.

1. Injection/extraction activity shall be recorded on a daily basis.
2. Average pump rate is measured in gallons per day (gpd) or alternative units.
3. Extracted Water/Year represents the total of water extracted from a well for the duration of the pilot test.
4. Sampling shall be performed during which extraction occurs. See Figure 1 (Technical Report, September 2021) above, for proposed sample collection anticipated during the ASR pilot test.

**Table 3 – Extraction Monitoring**

Constituent	Units	Type of Sample	Sampling Frequency/Events
Average Pumping Rate	gpm	Meter	Continuous per extraction event
Extracted Water/Year	ac·ft/yr	Meter	Continuous per extraction event
pH	pH units	Grab	see requirement 4 above
Electrical Conductivity	µmhos/cm	Grab	see requirement 4 above

<b>Constituent</b>	<b>Units</b>	<b>Type of Sample</b>	<b>Sampling Frequency/Events</b>
Total Dissolved Solids	mg/L	Grab	see requirement 4 above
Dissolved Organic Carbon	mg/L	Grab	see requirement 4 above
Total Organic Carbon	mg/L	Grab	see requirement 4 above
Calcium	mg/L	Grab	see requirement 4 above
Magnesium	mg/L	Grab	see requirement 4 above
Sodium	mg/L	Grab	see requirement 4 above
Potassium	mg/L	Grab	see requirement 4 above
Alkalinity (HCO <sub>3</sub> , CO <sub>3</sub> , OH)	mg/L	Grab	see requirement 4 above
Bicarbonate	mg/L	Grab	see requirement 4 above
Carbonate	mg/L	Grab	see requirement 4 above
Chloride	mg/L	Grab	see requirement 4 above
Sulfate	mg/L	Grab	see requirement 4 above
Fluoride	mg/L	Grab	see requirement 4 above
Aluminum	µg/L	Grab	see requirement 4 above
Arsenic	mg/L	Grab	see requirement 4 above
Chromium – total	µg/L	Grab	see requirement 4 above
Chromium - VI	µg/L	Grab	see requirement 4 above
Iron	mg/L	Grab	see requirement 4 above
Manganese	mg/L	Grab	see requirement 4 above
Nitrate (as Nitrogen)	mg/L	Grab	see requirement 4 above
Selenium	µg/L	Grab	see requirement 4 above
Uranium	µg/L	Grab	see requirement 4 above
Uranium	pCi/L	Grab	see requirement 4 above
Methane	µg/L	Grab	see requirement 4 above
Silica	µg/L	Grab	see requirement 4 above
Chlorine Residual (free)	mg/L	Grab	see requirement 4 above
Total Trihalomethanes	mg/L	Grab	see requirement 4 above
Bromodichloromethane	mg/L	Grab	see requirement 4 above
Dibromochloromethane	mg/L	Grab	see requirement 4 above
Bromoform	mg/L	Grab	see requirement 4 above
Chloroform	mg/L	Grab	see requirement 4 above
Total Haloacetic Acids	mg/L	Grab	see requirement 4 above
Monobromoacetic Acid	mg/L	Grab	see requirement 4 above
Monochloroacetic Acid	mg/L	Grab	see requirement 4 above
Bromochloroacetic Acid	mg/L	Grab	see requirement 4 above

<b>Constituent</b>	<b>Units</b>	<b>Type of Sample</b>	<b>Sampling Frequency/Events</b>
Dibromoacetic Acid	mg/L	Grab	see requirement 4 above
Trichloroacetic Acid	mg/L	Grab	see requirement 4 above

### **GROUNDWATER AQUIFER MONITORING**

The Permittee proposes to monitor the target aquifer storage zone using nested monitoring well MW. Prior to sampling, groundwater elevations shall be measured, and the nested well shall be purged of at least three well volumes until temperature, pH, and electrical conductivity have stabilized. Use of low flow or passive sampling methods that do not require well purging are acceptable if described in the approved Sampling and Analysis Plan (SAP). Samples shall be filtered using a 0.45-micron filter if required by the SAP. Depth to groundwater shall be measured to the nearest 0.01 feet. Groundwater monitoring shall include, at a minimum, the following. See Figure 1 (Technical Report, September 2021) above, for proposed sample frequency anticipated during the ASR pilot test.

**Table 4 - Groundwater Aquifer Monitoring**

<b>Constituent</b>	<b>Units</b>	<b>Type of Sample</b>
pH	pH units	Grab
Electrical Conductivity	µmhos/cm	Grab
Total Dissolved Solids	mg/L	Grab
Dissolved Organic Carbon	mg/L	Grab
Total Organic Carbon	mg/L	Grab
Calcium	mg/L	Grab
Magnesium	mg/L	Grab
Sodium	mg/L	Grab
Potassium	mg/L	Grab
Alkalinity (HCO <sub>3</sub> , CO <sub>3</sub> , OH)	mg/L	Grab
Bicarbonate	mg/L	Grab
Carbonate	mg/L	Grab
Chloride	mg/L	Grab
Sulfate	mg/L	Grab
Fluoride	mg/L	Grab
Aluminum	µg/L	Grab
Arsenic	mg/L	Grab
Chromium – total	µg/L	Grab
Chromium - VI	µg/L	Grab
Iron - Total	mg/L	Grab

<b>Constituent</b>	<b>Units</b>	<b>Type of Sample</b>
Manganese - Total	mg/L	Grab
Nitrate (as Nitrogen)	mg/L	Grab
Selenium	µg/L	Grab
Uranium	µg/L	Grab
Uranium	pCi/L	Grab
Methane	µg/L	Grab
Silica	µg/L	Grab
Chlorine Residual (free)	mg/L	Grab
Total Trihalomethanes	mg/L	Grab
Bromodichloromethane	mg/L	Grab
Dibromochloromethane	mg/L	Grab
Bromoform	mg/L	Grab
Chloroform	mg/L	Grab
Total Haloacetic Acids	mg/L	Grab
Monobromoacetic Acid	mg/L	Grab
Monochloroacetic Acid	mg/L	Grab
Bromochloroacetic Acid	mg/L	Grab
Dibromoacetic Acid	mg/L	Grab
Trichloroacetic Acid	mg/L	Grab

## REPORTING

All regulatory documents, submissions, materials, data, monitoring reports, and correspondence shall be converted to a searchable Portable Document Format (PDF) and submitted electronically. Documents that are less than 50 MB should be emailed to:

[CentralValleySacramento@waterboards.ca.gov](mailto:CentralValleySacramento@waterboards.ca.gov)

Documents that are 50 MB or larger should be transferred to a CD, DVD, or flash drive and mailed to the following address:

Central Valley Regional Water Quality Control Board  
 ECM Mailroom  
 11020 Sun Center Drive, Suite 200  
 Rancho Cordova, CA 95670

To ensure that your submittals are routed to the appropriate staff, the following information block should be included in any correspondence used to transmit documents to this office:

Facility Name: Sacramento County Water Agency  
Program: Non-15 Compliance  
Order: WQO 2012-0010-DWQ-RB5S-0007  
CIWQS Place ID: 881980

In reporting monitoring data, the Permittee shall arrange the data in tabular form so that the date, sample type (e.g., source water, injection well, extraction well, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with the *General Waste Discharge Requirements for Aquifer Storage and Recovery Projects That Inject Drinking Water into Groundwater*, Water Quality Order 2012-0010-DWQ (General Order), Notice of Applicability (NOA), and Basin Plan. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported in the Technical Addendum.

As required by the California Business and Professions Code sections 6735, 7835, and 7835.1, all groundwater monitoring reports shall be prepared under the supervision of a registered professional engineer or geologist and signed by the registered professional.

#### **A. Technical Addendum**

No later than **90 days** following the completion of the pilot test, the Discharger shall submit a Technical Addendum which include the following:

1. A discussion of the status (dates of injection, extraction, and idle time) for all extraction/injection wells associated with the ASR pilot test. Include a discussion on the disposal of extracted water.
2. The annual water quality report and public health goal report published during the calendar year (if required by CDPH).
3. Tabular and graphical summaries of all monitoring data collected during the pilot test (reporting limits for non-detectable results).
4. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the injection, extraction, and groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the General Order, the NOA, this MRP, and the Standard Provisions and Reporting Requirements (SPRRs). The narrative shall be supported by field logs for each monitoring well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged (if applicable, see notes on passive sampling in the Receiving Water section).
5. Calculation of change in groundwater elevations for each water-bearing interval monitored during the pilot testing activities. Monitoring data to be evaluated will be collected prior to injection, during injection, and during and after extraction activities.



6. A narrative discussion of the analytical results for all groundwater locations monitored including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable).
7. A comparison of baseline groundwater monitoring data with the injected water data to evaluate water quality during the storage and extraction periods of the test.
8. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum.
9. Copies of laboratory analytical report(s) for groundwater monitoring.
10. A calibration log verifying calibration of all handheld monitoring instruments and devices used to comply with the prescribed monitoring program.
11. Projected ASR project activity for the next calendar year.
12. A discussion of compliance and corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the General Order and/or the NOA.

A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of violations found during the reporting period, and actions taken or planned for correcting noted violations. If the Permittee has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain a statement by the Permittee, or the Permittee's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate and complete.

The Permittee shall implement the above monitoring program on the first day following issuance of the NOA.

This Order is issued under the authority delegated to the Executive Officer by the Central Valley Water Board pursuant to Resolution R5-2018-0057 and is effective upon signature.

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for PATRICK PULUPA, Executive Officer

12/5/2022

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Date