

## 3.8 Master Response on the Groundwater Management, Monitoring, and Mitigation Plan

### 3.8.1 Introduction

#### Overview

This master response addresses the issues commenters raised on the Groundwater Management, Monitoring, and Mitigation Plan (GMMMP). Commenters express concerns regarding the number, locations, and timing of the proposed monitoring measures, the timing of mitigation measures, and the members of the enforcement authority.

This master response is organized by the following subtopics:

- 3.8.2 EIR/EIS Monitoring Program
- 3.8.3 Effectiveness of Action Triggers and Corrective Measures
- 3.8.4 Number and Locations of the Monitoring and Mitigation Measures
- 3.8.5 Decision-Making Process
- 3.8.6 Enforcement Authority

#### Background of GMMMP

On June 28, 2011 SMWD, Cadiz Inc., and San Bernardino County (County) entered into a Memorandum of Understanding (June 2011 MOU) to address issues concerning the County's jurisdiction over the Project. Under the June 2011 MOU, the parties agreed, among other things, that the Project would be subject to the County's Desert Groundwater Management Ordinance, San Bernardino County Code Title 13 Division 3 Article 5 Sections 3306551, et. seq. (Ordinance) that SMWD would be the lead agency for the Project<sup>1</sup> and that the County would consider and potentially approve the GMMMP as a responsible agency. SMWD and Cadiz Inc. further agreed to provide the County with the technical reports, model outputs and analysis, and access to the technical consultants to assist the County in determining the Project's potential environmental impacts and to mutually develop a groundwater management plan that would be consistent with the County Ordinance.

The Draft GMMMP was prepared to comply with the County Ordinance as a excluded Project under the exclusion provisions set forth in section 33.06552 of the County Code. The Ordinance does not apply to the operation of groundwater wells where the operator has developed a groundwater management, monitoring, and mitigation plan approved by the County that is consistent with the Guidelines developed by the County to implement the Ordinance, where the County and the operator have executed an MOU that complies with the provisions of the Ordinance. The Draft GMMMP was included in the Draft EIR Vol. 2, Appendix B1. The Draft GMMMP sets forth a detailed plan of action to optimally manage groundwater resources, monitor and address potential significant adverse impacts to critical resources, and to ensure that Project operations will be conducted without significant adverse impacts to critical resources. As defined

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<sup>1</sup> Please see Master Response 3.10 for a discussion of SMWD's role as the CEQA lead agency for the Project.

in the Draft GMMMP, these critical resources include the following: groundwater aquifers tapped by the Project, local springs within the Fenner Watershed, brine resources of Bristol and Cadiz Dry Lakes, air quality in the Mojave Desert region, and adjacent areas including the Colorado River and its tributary sources of water. The Draft GMMMP included in the Draft EIR was not a final document and was expressly subject to further discretionary review by SMWD and by the County.

On May 11, 2012, SMWD, Cadiz Inc., Fenner Valley Mutual Water Company (FVMWC), and the County entered into a MOU outlining a framework for County review of the Project under its Ordinance as a responsible agency the preparation of the GMMMP (see Final EIR, Appendix N Memorandum of Understanding by and among the Santa Margarita Water District, Cadiz Inc., Fenner Valley Mutual Water Company, and the County of San Bernardino) (“May 11, 2012 MOU” or “MOU”). The May 11, 2012 MOU is a first step, and it does not obligate SMWD to proceed with the Project or to presume that the environmental documentation for the Project will be certified, nor does it require the County to approve the GMMMP. The MOU provides a framework for managing the basin consistent with the County’s Ordinance. In compliance with the provisions of the MOU and the County Ordinance, the Draft GMMMP was updated since the publication of the Draft EIR to clarify matters such as the County’s enforcement authority over the management plan, the details of monitoring and corrective measures beyond those required by CEQA to protect critical resources, and to establish a management “floor” for the drawdown of groundwater levels and a limit for brine migration. The Updated GMMMP is included in the Final EIR Vol. 7, Appendix B1 Updated GMMMP. The revisions strengthen the management plan but do not alter the analysis or findings in the EIR or present any new information regarding the Project or potential impacts of the Project that would require recirculation. The Updated GMMMP was prepared to satisfy the exclusion provisions of the County Ordinance and is subject to the County’s discretionary review and approval as a responsible agency under CEQA.

The GMMMP, if adopted and approved by SMWD and the County, include five corrective measures (**AQ-5**, **GEO-1**, **HYDRO-2**, **HYDRO-3** and **MIN-1**) that are also included among the fifty-one mitigation measures contained in the Project’s Mitigation, Monitoring, and Reporting Program (MMRP). Further, where required by the County’s Ordinance, the GMMMP also includes additional corrective measures – measures that are not required by CEQA as they do not address any significant environmental impacts of the Project. For instance, pursuant to the County Ordinance, additional management measures for springs and groundwater drawdown are included in the GMMMP, but these corrective measures are not recommended in the EIR as mitigation measures, as they are not required to mitigate a significant environmental impact of the Project under CEQA. If the Project is approved, SMWD will adopt and enforce a complete set of the 51 mitigation measures that address all Project impacts. For those five (5) mitigation measures that are included in both the MMRP and the GMMMP, SMWD will retain oversight authority over their implementation, but, pursuant to CEQA Guidelines section 15097(a), will delegate enforcement authority to the County to monitor in conjunction with its oversight of the GMMMP. Nonetheless, SMWD will review and consider the County’s ongoing determination of compliance with those five (5) mitigation measures that are also part of the GMMMP in assessing the Project’s compliance with the MMRP.

## 3.8.2 2001 EIR/EIS Monitoring Program

### Summary of Issues Raised by Commenters

- Some elements of the monitoring and mitigation measures developed under the earlier Cadiz Project were not included in the Draft GMMMP.

### Response

Commenters requested that the monitoring and mitigation measures developed under the “previous Cadiz project” be considered for inclusion in the Draft GMMMP. The commenters are referring to the EIR/EIS for the Metropolitan Water District of Southern California (Metropolitan) and Bureau of Land Management (BLM) project (previous Metropolitan project), *Cadiz Groundwater Storage and Dry-Year Supply Program Final Environmental Impact Report and Final Environmental Impact Statement*, Volume 1, September 2001.

This GMMMP is similar to the management plan prepared for the previous Metropolitan project, referenced above. However, while there are similarities between the previous Metropolitan project and the proposed Project, particularly the Phase 2 - Imported Water Storage Component, they are fundamentally different projects. The lead agency is now SMWD rather than Metropolitan. This is significant because each agency exercises its independent discretion to determine whether a particular measure is feasible and necessary to reduce or avoid a significant environmental impact (see Public Resources Code §§21081 and 21082.1). In addition, the Project provides for recovery and beneficial use of fresh groundwater that currently flows to the Dry Lakes and evaporates. The previous Metropolitan project was limited to a storage project that would have potentially increased the flow of groundwater to the Dry Lakes when Colorado River water was introduced into the system. Further, the current Project proposes to convey less water and use a new conveyance facility that is within the existing Arizona and California Railroad Company (ARZC) right-of-way (ROW). The previous Metropolitan project proposed a conveyance facility over undisturbed BLM land that would convey up to 150,000 AFY, a much higher volume of water compared to this Project’s pipeline capacity of an average 50,000 AFY (Phase 1). If in the future and after subsequent environmental review the Phase II storage component is approved, the maximum volume of water conveyed would be 105,000 AFY. A number of mitigation measures proposed in the previous Metropolitan project concerned the potential impacts resulting from the construction of the conveyance facility over undisturbed BLM land. These measures are inapplicable now because the Project does not use BLM land. In addition, the wellfield configurations are not the same and if Phase II is not proposed, approved and implemented, spreading basins would not be constructed, as were necessary for the Metropolitan project. Accordingly, while monitoring and mitigation measures from the previous Metropolitan project are useful as an initial starting point (indeed, the many of critical resources, action criteria, and corrective measures identified in the Metropolitan Groundwater Monitoring and Management Plan were used to develop this Project’s Draft and Updated GMMMP), as lead agency, SMWD exercised its independent judgment and authority to determine what measures are necessary to mitigate significant Project impacts and whether the measures are feasible. In addition, the proposed provisions in the Updated GMMMP are subject to SMWD and County’s discretionary review and approval as lead and responsible agencies, respectively

In addition to the substantial differences between the previous project and the current proposed Project, there has also been a significant amount of new information developed to enhance the understanding of the Watersheds. Numerous investigations were conducted to acquire a more detailed and refined understanding of the surface and subsurface geology and hydrogeology (Draft EIR Vol. 4, Appendix H1 Cadiz Groundwater Modeling and Impact Analysis, Sub-Appendix B). Using these additional data, new aquifer testing was conducted within specific geologic units in the proposed wellfield location to measure the aquifer response to pumping (Draft EIR Vol. 4, Appendix H1 Cadiz Groundwater Modeling and Impact Analysis, Sub-Appendix A). The combined data was used to develop aquifer models to estimate the recharge of water to the Watershed and to create a groundwater flow and transport model used to test the aquifer response to different recharge scenarios, wellfield arrangements, and pumping rates (Draft EIR Vol. 4, Appendix H1 Cadiz Groundwater Modeling and Impact Analysis). The modeling software packages used in this Project are significant updates from the previous models used for the previous Metropolitan project. Consequently, the understanding of site conditions and model-predicted responses has been greatly expanded since consideration of the previous Metropolitan project, and this information was utilized in developing the monitoring and mitigation measures specific to the current Project. With this Project and the expanded and refined understanding of the site conditions and aquifer behavior, the monitoring and corrective measures were also updated and refined to better address the model-predicted responses.

The Updated GMMMP contains a set of “early warning” monitoring features (See Final EIR Vol. 7, Appendix B1 Updated GMMMP, Chapter 5), specific objective action criteria (i.e. the pre-impact “triggers” and corrective measures, Chapter 6), as well as strong enforcement provisions, including the organization of a Technical Review Panel (TRP) that will monitor and advise on technical aspects of the Project (Chapters 6 and 8). As proposed in the Updated GMMMP’s adaptive management provisions, new monitoring measures may be proposed to refine the Management Plan as a result of information obtained from monitoring (See Updated GMMMP, Chapter 8). The Updated GMMMP is also designed to include a multi-level review of the monitoring, triggering events, and corrective actions. Under the decision-making process, FVMWC will notify all parties (County, SMWD, and TRP) within 10 business days of any triggering event and, within 60 days will provide an initial assessment and recommendation to be reviewed by the TRP. The TRP will then prepare its own assessment and recommendation for review by the County. The County’s decision will be final and immediately effective, subject to a dispute resolution process. Disputes involving immediate or irreparable injury to any party, including enforcement actions by the County, shall be subject to direct judicial review. Further, for those five corrective measures in the GMMMP that are also mitigation measures (discussed above), SMWD will, as lead agency, retain the right to assess compliance and will have the right to terminate the Project’s approvals for violations of those five mitigation measures through its enforcement of the MMRP.

Through its roles as a shareholder in the FVMWC and the designated agency in the Joint Powers Authority (JPA) with FVMWC, SMWD would be responsible for management and control of Project operations and will act as the approving authority for the design and construction of the Project. The governance of the JPA, as set forth in a Joint Powers Agreement between SMWD and FVMWC, will provide SMWD with full management and operational control of the JPA.

SMWD will be the "designated entity" pursuant to Government Code section 6509. The JPA, as managed by SMWD, will review and approve the Project designs and specifications in coordination with SMWD as the lead agency for the Project, manage and oversee the operation of the Facilities in coordination with FVMWC pursuant to the terms of a Facility Operation Agreement, and oversee the compliance of the Project with the GMMMP in coordination with SMWD as the lead agency for the Project.

The TRP would be comprised of one technical representative appointed by the SMWD, one technical representative appointed by the County, and a third technical representative jointly selected by the technical representatives from SMWD and the County. All appointments would be in the discretion of the County and SMWD parties respectively, but all three members of the TRP would possess professional technical qualifications appropriate to the tasks of the TRP (e.g., state certifications in engineering, hydrogeology, or geology) and would be required to have a minimum of ten years professional experience working in the groundwater field.

Unlike the previous Project which utilized BLM ROWs and required federal environmental review under the National Environmental Policy Act (NEPA), the current Project does not impact any federal lands and no NEPA review is required. Therefore, it is unnecessary to include additional private groups or federal agencies such as the National Park Service (NPS) in the Management Plan. Please cross-reference **Master Response 3.13** Right-of-Way and NEPA.

### 3.8.3 Effectiveness of Action Triggers and Corrective Measures

#### Summary of Issues Raised by Commenters

- The monitoring measures would not detect potential impacts in time to implement mitigation measures that would prevent or mitigate irreversible adverse impacts related to subsidence, groundwater level drawdown, and brine movement.
- The monitoring measures would cease at the end of the Project term, but irreversible adverse impacts could occur after the monitoring measures ceased.

#### Response

Commenters expressed various concerns regarding the timing of monitoring and mitigation measures, five of which are also corrective measures in the Updated GMMMP. The concerns were focused on (1) and mitigation the ability of the monitoring measures to detect potential impacts in time to address them before irreversible adverse impacts, or (2) potential impacts occurring after the Project has ceased and monitoring is no longer occurring to watch for those potential impacts. The concerns included the potential impacts of subsidence, groundwater drawdown, brine movement, and potential impacts to springs (see **Master Response 3.4** Springs).

As described in the Updated GMMMP (Final EIR Vol. 7, Appendix B1 Updated GMMMP, Section 1.2), the Project would be comprised of a pre-operational period for construction, a

50-year operational period during which the water extraction would occur, and a post-operational monitoring period that would last a minimum of 10 years, subject to review and a potential extension by the County. No later than Year-25 of Project operations, FVMWC in coordination with the TRP must develop a draft Closure Plan for submission to the SMWD, the County and the TRP. The TRP will then submit a formal written recommendation to the County within one year of its receipt of the draft Closure Plan. A final Closure Plan will be approved by the County.

The Closure Plan would monitor groundwater levels and groundwater quality for a minimum period of 10 years to protect critical resources and groundwater quality for beneficial uses. FVMWC and the TRP may recommend a longer post-operational period as necessary to ensure that there are no residual effects of the Project operations during the post-operational phase of the Project and the period of extended monitoring. At a minimum, the Closure Plan will provide that: (a) injection wells or other mitigation to address saline water migration shall continue unless and until stable groundwater flow gradients from the wellfield toward the Dry Lake playas are restored such that the saline-freshwater boundary can be maintained naturally at within 6,000 feet (or less) of baseline conditions; (b) post-closure groundwater pumping under this Project, if approved, would be expected to be maintained at rates at or below the rate of recharge and as necessary to avoid Undesirable Results; and (c) the Project would establish and maintain an escrow account or other equivalent financial assurances mechanisms for post-closure operations. All wells that are abandoned shall be destroyed in a manner consistent with all applicable state and local regulations and industry standards. Further, the provisions and mitigation obligations under the GMMMP would remain in effect and run concurrently with the term of the Closure Plan. Consistent with the May 11, 2012 MOU framework between the County, SMWD, FVMWC, and Cadiz Inc., the County would determine the final elements and term of the Closure Plan, subject only to the Dispute Resolution procedures reflected in both the MOU and GMMMP. Throughout Project operations and the post-operation phase, FVMWC, in coordination with the TRP and County oversight, would review the monitoring features, compare data with established action criteria, implement decision making protocols, and implement corrective actions. The following sections describe these procedures for subsidence, groundwater drawdown, and brine movement, springs and air quality.

### ***Subsidence***

Land subsidence can be caused by the removal of water from pore spaces in the subsurface materials, with clayey materials being the most susceptible. As described in the Draft EIR Vol. 1, Section 4.6.3 Geology and Soils, pp. 4.6-35 to 4.6-38, the long-term extraction of groundwater could result in some land subsidence, although the model-predicted maximum amounts would be on the order of one to two inches at most and only in limited areas.

Even though the model-predicted subsidence would not exceed the railroad tolerance levels, and the degree of potential land subsidence would not significantly impact that alluvial aquifer's useable storage capacity, nonetheless, the project design features and corrective measure of Section 6.3 of the Updated GMMMP are incorporated in the Final EIR as Mitigation Measure **GEO-1** to ensure any potential significant adverse effects are avoided or mitigated to a less than significant level.

The Updated GMMMP includes monitoring features for subsidence consisting of twenty land survey benchmarks and three extensometers distributed in the area where the aquifer model predicts some subsidence could occur and the use of InSAR satellite data (Final EIR Vol. 7, Appendix B1 Updated GMMMP, Sections 5.6, 5.7, and 6.3). The extensometers would be monitored continuously, land surveys will be conducted annually and the InSAR data reviewed at least every five years from installation through the post-operational period. The decision-making process under the GMMMP would be initiated if either of the action criteria is triggered. The action criteria are: 1) a trend in subsidence that would result in a decline in the ground surface elevation of more than .3 feet within ten years compared to baseline conditions or 2) a trend in subsidence which, if continued, would be of a magnitude within ten years that impacts existing infrastructure within the Project area (the magnitude for railroad tracks being more than one inch vertically over 62 feet linearly along the existing railroad tracks (See Final EIR Vol. 7, Appendix B1 Updated GMMMP Section 6.3). This is half of the significance threshold (railroad tolerance level) of 2 vertical inches across a 62 feet segment identified in the Draft EIR Vol. 1, Section 4.6 Geology. As noted in Draft EIR Vol. 4, Appendix H1 Cadiz Groundwater Modeling and Impact Analysis, Section 8.6, any predicted land subsidence would occur gradually over time and be dispersed laterally. The model-predicted land subsidence is not anticipated to result in any significant effects.

Nonetheless, Mitigation Measure **GEO-1** and the Updated GMMMP includes corrective measures to address land subsidence in the event that land subsidence does exceed action criteria, including repairing any structures damaged as a result of subsidence attributable to Project operations or entering into a mitigation agreement with any impacted party(s) and modification of Project operations to arrest the subsidence. Once the extraction of groundwater ceases at Year 50, groundwater levels around the wellfield and adjacent railroad tracks would immediately begin to rise in response to the resumed flow of groundwater from the upgradient areas and the filling in of the cone of depression. The pore spaces in the subsurface materials would then refill with water, thus eliminating the driver for potential further subsidence. While subsidence is predicted to continue around the edges of the Dry Lakes and the center of Bristol Dry Lake after Project pumping stops, there are no railroad facilities present that require a low tolerance level. Rather, the only structures are the salt production operations which, if impacted, would be repaired or compensated for repairs necessary to continue their beneficial use of the Dry Lakes pursuant to Updated GMMMP Project Design Feature 6.3 and Mitigation Measure **GEO-1**.

### ***Groundwater Drawdown***

As described in the Draft EIR Vol. 1, Section 4.9.3 Hydrology and Water Quality, pp. 4.9-63 to 4.9-71, the extraction of groundwater is anticipated to result in the lowering of groundwater levels within a specific area. The model-predicted lateral extent and depth of groundwater drawdown is not anticipated to result in adverse impacts and water levels are expected to immediately begin to return to pre-pumping levels after the cessation of pumping. As shown in Figure 4.9-13, under Sensitivity Scenario 1 of 16,000 AFY of recharge, drawdown terminates before reaching the Mojave National Preserve to the north and well before the Preserve under the Project Scenario and Sensitive Scenario 2 (see Draft EIR Vol. 1, Section 4.9 Hydrology and Water Quality,

Figures 4.9-12 and 4.9-14 and Draft EIR Vol. 4, Appendix H1 Cadiz Groundwater Modeling and Impact Analysis, Figures 64-69 that present the full watershed).

Notwithstanding the analysis in the EIR, which concluded that there would be no significant impacts related to groundwater drawdown, the Updated GMMMP, as part of compliance with the County Ordinance, includes a groundwater drawdown “floor” below which further drawdown is proscribed. The groundwater drawdown floor provides an added management feature that will allow for adaptive management in the event that changed or unforeseen circumstances result in effects outside the range of the model predictions. The floor in the Updated GMMMP would be set at elevation 530 feet (80 feet below baseline elevations). The floor will be calculated as an average groundwater elevation over a 2-mile radius from the center of the Project wellfield area. Once the floor is reached, and absent approval of a new floor by the County, groundwater pumping must be reduced or curtailed to a level necessary to maintain levels at or above the 80-foot floor. After 15 years of operation, FVMWC or SMWD may apply to the County for a lowering of the floor up to 100 feet below the baseline elevation. The County would make the determination to lower the floor in consultation with the TRP and based on the following five findings: (i) sufficient operational data exists to support a decision to lower the floor and avoid Undesirable Results; (ii) the urban water management plans for each of the municipal water agencies and purveyors receiving water from the Project have disclosed the 50-year limit on the water supply; (iii) additional water conservation benefits will be realized at the proposed floor; (iv) lowering the floor will not trigger either the action criteria or corrective actions under this Management Plan; and (v) there is no other threat of adverse environmental consequences that may arise due to changed or unforeseen circumstances.

Monitoring features for groundwater drawdown include monitoring wells located within a 2-mile radius of the center of the Project wellfield to measure average groundwater elevations in the wellfield area. In addition, numerous observation wells and dozens of existing and new production wells will monitor groundwater levels (Draft EIR Vol. 7, Appendix B1 Updated GMMMP, Sections 5.3, 5.4, 5.5, 5.9 and 5.10). These monitoring measures would be monitored continuously to semiannually, depending on the well, from installation through the post-operational period (see Table 5.1 in the Updated GMMMP). Once the extraction of groundwater ceases at Year 50 of the Project, the modeling prepared for the Project (see **Master Response 3.2** Groundwater Modeling) estimates that groundwater levels would immediately begin to rise around the wellfield in response to the resumed flow of groundwater from the upgradient areas, filling in the cone of depression. Groundwater levels around the Dry Lakes would recover more slowly until the natural gradient towards the Dry Lakes is reestablished along with the groundwater flow. The water table would return to the pre-pumping levels, thus eliminating the potential for impacts to wells (see Draft EIR Vol. 4, Appendix H1 Cadiz Groundwater Modeling and Impact Analysis, Figures 70 and 71).

The Updated GMMMP provides that the post-operational period would last for a minimum of ten years after the cessation of pumping. If ten years is determined insufficient, the County can require, through enforcement of the GMMMP and Closure Plan, additional monitoring time to verify that water levels are in fact recovering.



### **Brine Movement**

As described in the Draft EIR Vol. 1, Section 4.9.3 Hydrology and Water Quality, pp. 4.9-49 to 4.9-53, the extraction of groundwater from the wellfield in the Fenner Gap area is anticipated to result in the migration of the saline water/freshwater interface from the Dry Lakes toward the wellfield. Most of the migration would occur during the 50-year operational period and would slow and stop after the cessation of pumping. However, the model-predicted migration distance is not anticipated to reach within at least two miles of the existing freshwater wells in the area, and the interface migration would slow and then stop after the cessation of pumping. The saline water movement would stop as water levels equilibrate and recover. Once water levels recover, saline water migration from the Dry Lakes will cease.

Mitigation Measure **HYDRO-2** and the Updated GMMMP includes monitoring features for groundwater quality consisting of existing wells and new clusters wells between the Project wellfield and Bristol and Cadiz Dry Lakes to monitor the migration of the saline-freshwater interface (Final EIR Mitigation Measure **HYDRO-2**; Vol. 7, Appendix B1 Updated GMMMP, Sections 5.3, 5.9, 5.10 and 6.4). The cluster wells will be located on the freshwater side and within 6,000 feet of the saline-freshwater interface. These wells would be monitored continuously throughout the term of the Project (see Updated GMMMP, Section 6.4 and 6.5). A management feature is included in the GMMMP to limit the migration of saline-freshwater interface by more than 6,000 feet (Final EIR Vol. 7, Appendix B1 Updated GMMMP, Section 6.4). The saline-freshwater interface is measured where water quality meets the Upper Limit secondary Maximum Contaminant Level (MCL) for Total Dissolved Solids (TDS) of 1,000 milligrams per liter (mg/L). If TDS concentrations in any of the interface monitoring wells is measured in excess of 600 mg/L, FVMWC would implement measures that may include injection or extraction wells or other physical means to maintain the freshwater-saline interface or modify Project operations (see Updated GMMMP Figure 5-1). Installation and pumping of additional water for injection or extraction will be subject to subsequent review by the County if and when it is required and when details concerning the locations and type of facilities can be determined through analysis of Project monitoring of the interface during operations. These features may require further environmental review (an addendum or other means to ensure compliance with CEQA) and would be subject, at a minimum, to applicable measures set forth in the MMRP. As noted in the Draft EIR Vol. 1, Section 4.9.3 Hydrology and Water Quality, pp. 4.9-49 to 4.9-53, other than the salt production company wells that purposely pump saline water to produce salts, there are no known wells within the model-predicted area where interface migration would occur. Therefore, the water quality in wells is not anticipated to be impaired. In the event a third-party well were impaired, project design features 6.2 and 6.4 in parallel with Mitigation Measures **HYDRO-2** and **HYDRO-3** include corrective measures address potential impacts from groundwater drawdown and brine movement including modifying Project operations, and replacing affected wells.

Once the extraction of groundwater ceases at Year 50 of the Project, the migration of the interface would slow and gradually stop with the maximum model-predicted migration of the interface still not reaching existing freshwater production wells (see **Master Response 3.2** Groundwater Modeling and **3.3** Groundwater Pumping Impacts).

The Updated GMMMP provides that the post-operational period would last for a minimum of ten years after the cessation of pumping, providing more than enough time to verify that the interface migration has stopped and requires that physical measures be continued throughout the post-pumping period as necessary to maintain the 6,000-foot limit. Over time, as the natural gradient reasserts itself, the saline-freshwater interface will migrate back toward the Dry Lakes.

### ***Springs***

As described in the Draft EIR (Vol. 1, Section 4.9.1 Hydrology and Water Quality, p. 4.9-19, Section 4.9.3, pp. 4.9-59 to 4.9-61, and Draft EIR Vol. 4, Appendix H3 Assessment of Effects of the Cadiz Groundwater Conservation Recovery and Storage Project Operations on Springs), the detailed evaluation of the springs concluded that there is no hydraulic connection between the springs and the aquifers because the water supply to the springs is not from the regional groundwater aquifer system from which Project wells will withdraw groundwater. Because the Project is not anticipated to have any effect on the spring flows in any of the Fenner Watershed springs, no mitigation measures are necessary to protect Project area springs.

However, consistent with the recommendations of the Groundwater Stewardship Committee, and as a conservative monitoring protocol conditioned under the County's Groundwater Management Ordinance, baseline and periodic visual observation and flow estimates are proposed to be performed at the Bonanza Spring in the Clipper Mountains, the Whiskey Springs in the Providence Mountains (near Colton Hills), and Vontrigger Spring in the Vontrigger Hills, east of the Hackberry Mountains, no less often than quarterly during the pre-operational and operational period of the Project and annually during the post-operational period. The Bonanza Spring will be monitored as an "indicator spring" because it is the spring that is in closest proximity to the Project wellfield (approximately 11 miles from the center of Fenner Gap). The Whiskey and Vontrigger Springs will be monitored to compare variations in spring flow from those springs to variations in spring flow from the Bonanza Spring to determine whether reductions of flow at the Bonanza Spring are attributable to the Project operation or instead are attributable to annual precipitation. Monitoring of groundwater levels in monitoring wells located between Bonanza Spring and the wellfield will also be conducted to provide data which could be used to correlate changes in groundwater levels attributed to the Project to changes in flow in the Bonanza Spring.

The Updated GMMMP includes a County management feature addressing springs with action criteria and corrective actions to be taken, including modifications to Project operations. Although the EIR concludes that Project operations will not cause a reduction in average annual or seasonal flows at Bonanza Spring, the Updated GMMMP provides that if Project operations were to cause such a reduction and that reduction were to exceed baseline flows, corrective action would be required. The number and location of springs to be monitored is sufficient to determine if a Project induced reduction in flow were to occur, and the Updated GMMMP includes corrective actions that would be required to re-establish baseline flows. See **Master Response 3.4 Springs**.

### ***Air Quality***

The Draft EIR determined that groundwater is not connected to the erosion potential of the Dry Lake surface soils and therefore the lowering groundwater levels beneath the Dry Lakes is not

expected to increase dust generation from the Dry Lakes or otherwise affect regional air quality. Draft EIR, Vol. 1, Section 4.3.4, pp. 4.3-15 to 4.3-16; see, also, **Master Response 3.5** Dry Lake Dust.

However, consistent with the recommendations of the Groundwater Stewardship Committee and as a conservative monitoring protocol to be conditioned by the County under its Ordinance, Cadiz will prepare a monitoring plan in consultation with the TRP to address possible sources of fugitive dust emissions (depth to groundwater, surface vegetation, surface soil chemistry) and local air quality over time (nephelometers and weather stations) to verify that the Project does not increase dust generation (i.e., particulate matter) from the Dry Lakes. The monitoring plan, at a minimum, would set forth specific performance criteria consistent with the action criteria in the Updated GMMMP, Section 6.8, and identify specific monitoring methods, the precise location of weather stations and nephelometers, measures to protect quality assurance and quality control, and reporting parameters.

Monitoring would include four nephelometers one upwind and one downwind of Bristol Dry Lake and one up wind and one downwind of Cadiz Dry Lake. These monitoring features would provide data on a daily basis. In addition, FVMWC would conduct annual visual observations at four points on each of the Dry Lakes to record surface soil conditions. If changes in annual average or peak concentrations of airborne particulate matter exceed baseline conditions by five percent or more or if changes in surface soil conditions on the Dry Lakes show degradation of soil structure and increased susceptibility to wind erosion compared to baseline conditions, corrective measures would be taken to re-establish baseline conditions. The monitoring and corrective measures are included both in the GMMMP in Section 6.8 and in the MMRP as Mitigation Measure **AQ-5**.

## 3.8.4 Number and Locations of the Monitoring and Mitigation Features

### Summary of Issues Raised by Commenters

- The proposed locations of the monitoring features for springs are insufficient;
- Well locations and numbers are insufficient.

### Response

Commenters expressed various concerns regarding the number and location of monitoring measures. The concerns were focused on adding additional wells or springs to the monitoring network (addressed above under “Springs”). Commenters expressed concern regarding (1) the ability of the monitoring measures to detect potential impacts before irreversible adverse impacts or (2) areas where monitoring measures are not proposed in the Draft GMMMP.

## **Wells**

Commenters suggested that additional wells be installed to monitor the aquifer response to pumping, particularly in areas outside of the model-predicted groundwater drawdown. As described in the Updated GMMMP, as a feature of the Project, the proposed well monitoring network would include 20 observation wells, three Project-area observation well clusters, up to 34 existing and new production wells, three proposed observation well clusters at Bristol Dry Lake, and three proposed observation well clusters at Cadiz Dry Lake (Final EIR Vol. 7, Appendix B1 Updated GMMMP, Sections 5.3, 5.4, 5.5, 5.9, and 5.10 and Table 5.1). The locations provide coverage both within the area where model-predicted groundwater drawdown and saline-freshwater interface migration would occur, as well as areas outside of the model-predicted area of groundwater drawdown, as described more particularly below. The purpose of the proposed monitoring locations outside of the model-predicted area is to monitor the aquifer response to pumping and provide an early warning in the unlikely event that the aquifer response is larger than predicted by the groundwater modeling.

Monitoring locations upgradient and north to northeast of the wellfield within the Fenner Watershed, moving from closer to farther from the wellfield, would include three wells in Danby (located at the BNSF line, not at the dry lake) where groundwater drawdown is anticipated to be ten feet or less, to one well in Essex at the maximum extent of predicted groundwater drawdown, to one well in Fenner and one well in Goffs where no groundwater drawdown is anticipated. In addition, one well will be installed even further away in Piute, completely outside of the Fenner Watershed, where no groundwater drawdown due to the Project is possible because the Piute well is not in the same basin. Commenters suggested additional monitoring locations even further north in the Mojave National Preserve but the proposed string of locations from Danby to Essex to Fenner to Goffs to Piute would be more effective at monitoring the aquifer response both within the Fenner Watershed and outside and adjacent to the watershed boundary because they would be expected to be impacted first, if at all. Wells located further away would not be as effective at providing early warning of unanticipated effects.

Monitoring locations south of the wellfield would include well clusters near the edge of and on Cadiz Dry Lake and one well at the ARZC rail line in between the Ship and Old Woman Mountains, where drawdown is predicted at about ten feet. In addition, one well will be installed even further southeast near Danby Dry Lake, completely outside of the Cadiz Watershed, where no groundwater drawdown due to the Project is possible because the well near Danby Dry Lake is not in the same basin (Draft EIR, Vol. 1 Section 4.9 Hydrology and Water Quality, Section 4.9.3 Impact and Mitigations Analyses, p. 4.9-48). Commenters suggested monitoring locations even further south but locations further south would be even further outside of the basin, and The well near Danby Dry Lake would be more effective at monitoring the watershed boundary.

The watershed boundary west of Bristol Dry Lake stops at the topographic divide between Bristol Dry Lake and Bagdad Dry Lake further to the west. This basin boundary is formed by the Amboy Crater, a cinder cone and lava field. The geology at this divide would not allow the flow of groundwater between the watersheds (Draft EIR Vol. 1, Section 4.9.1 Geology and Soils, p. 4.6-7). Consequently, commenters' suggestions of monitoring at locations further west, such as at the

Twentynine Palms Marine Corps Base, would not provide useful information because the locations are outside of the basin and cannot be affected by Project operations.

Under Mitigation Measures **HYDRO-2** and **HYDRO-3**, as well as the Updated GMMMP, these monitoring features would be monitored continuously to semiannually, depending on the well, from installation through the post-operational period (see Table 5.1 in the Updated GMMMP) and are sufficiently comprehensive to monitor the Project's potential effects on critical resources because the location of the wells are designed to provide early warnings of potential effects before any actual impacts occur. Further, the Updated GMMMP provides flexibility to add monitoring features where, based on operational data, if additional monitoring is necessary to avoid impacts to critical resources as set forth in the Updated GMMMP.

### 3.8.5 Decision-Making Process

#### Summary of Issues Raised by Commenters

- The monitoring and decision-making process improperly defers analysis of potential environmental impacts to the future.

#### Response

Commenters assert that the decision-making processes described in the Draft GMMMP improperly defers analysis of potential environmental impacts to the future, in violation of CEQA.

The Draft EIR analyzed the potential environmental effects resulting from Project pumping including effects of groundwater drawdown on subsidence, brine migration (water quality), air quality, vegetation and springs. As analyzed in the Draft EIR Vol. 1, Chapter 4, the predicted drawdown is not expected to have any significant impact on these resources. Third party wells could be impacted, but any impacts would be less than significant with the implementation of recommended mitigation measures. Therefore, comprehensive analysis of the potential environmental impacts of the Project and of proposed mitigation measures to address potential impacts of the Project occurred in the Draft EIR and was not deferred.

The monitoring provisions contained in the Updated GMMMP have been included pursuant to the County Ordinance. The County, as a responsible agency, may choose to impose monitoring and mitigation provisions more conservative than those required by CEQA as identified in the Draft EIR. The provisions of the Updated GMMMP that relate to CEQA are those which are also recommended as mitigation measures in the EIR: Mitigation Measure **AQ-5** (Updated GMMMP Section 6.8), **GEO-1** (Updated GMMMP Section 6.3), **HYDRO-2** (Updated GMMMP Section 6.4), **HYDRO-3** (Updated GMMMP Section 6.2), and **MIN-1** (Updated GMMMP Section 6.5).

Mitigation Measures **AQ-5**, **GEO-1**, **HYDRO-2**, **HYDRO-3**, and **MIN-1**, include a detailed monitoring network, decision-making processes, and corrective measures and described in detail in both the EIR and in the Updated GMMMP (Final EIR Vol. 7, Appendix B1 Updated

GMMMP, Chapter 5 and 6). In compliance with CEQA, the action criteria and corrective measures set forth in Mitigation Measures **AQ-5**, **GEO-1**, **HYDRO-2**, **HYDRO-3**, and **MIN-1** and in the Updated GMMMP for third party wells, subsidence, induced flow of lower quality water, brine resources and air quality each provide objective performance standards that are complemented with a set of clear enforceable measures that would reduce or avoid significant impacts to critical resources. These measures would be implemented by FVMWC (consisting of SMWD and other water districts), reviewed by the TRP, and enforced by the County. However, SMWD would continue to have oversight of the mitigation measures as lead agency and retains full rights to enforce the MMRP, including failure to comply with Mitigation Measures **AQ-5**, **GEO-1**, **HYDRO-2**, **HYDRO-3**, and **MIN-1**.

Mitigation Measures **AQ-5**, **GEO-1**, **HYDRO-2**, **HYDRO-3**, and **MIN-1** and the corresponding provisions of the Updated GMMMP identify specific elements of the monitoring network to be implemented to monitor the nature and extent of the aquifer response to pumping under the Project. Specific action criteria were developed to trigger when a decision regarding an impact must be made. If the impact is determined to be due to Project activities, then the corrective measures (mitigations) must be implemented. The Updated GMMMP identifies a variety of corrective measures to enable the decision makers (SMWD and the County, see Section 3.8.6 below) to match a corrective action to the magnitude of the impact. Therefore, because the potential impacts have been identified in the EIR and mitigation measures have been developed to address the impacts, there is no improper deferral under CEQA.

To the extent well construction under the Updated GMMMP (i.e. new monitoring or production wells) may cause an environmental effect, implementation of the Project mitigation measures would reduce impacts to a less than significant level. Use of existing monitoring wells would not have significant environmental effects because the wells are already constructed and maintained and have been used for monitoring. All proposed wells that require construction will be located on Cadiz Property with the exception of wells to be located on land near the center of Bristol and Cadiz Dry Lakes to monitor water levels of salt production operations (see Final EIR Vol. 7, Appendix B1 Updated GMMMP, Figure 5-1). These areas are devoid of vegetation due to the extremely high salt content in the soil and already disturbed by existing salt production. Monitoring well boreholes are only 16 inches in diameter (compared to production wells with 48 inch boreholes), and the precise location is flexible thereby allowing for impact avoidance. All monitoring features that require construction (including monitoring wells) would be subject to the same mitigation measures required for other Project facilities. Other monitoring features such as nephelometers and extensometers would require minimal construction (equipment anchoring), and precise placement of the equipment would be flexible to minimize any potential effects.

Corrective actions under the Updated GMMMP include the potential for construction of brine extraction well(s) and/or injection well(s) at the northeastern edge of Bristol Playa or north of Cadiz Playa. These potential wells would be located on Cadiz Inc. property and their construction would be subject to the same mitigation measures imposed on the Project wellfield as set forth in the SMWD's MMRP. The potential wells would be similar in size

and scope to the production wells as set forth in Figure 5-4 in the Updated GMMMP. Due to the minimal footprint of the wells, the large area within which the wells could be located and the limited habitat value in these areas for sensitive species, impacts of this potential corrective action would be less than significant with mitigation. Nevertheless, if required under the Updated GMMMP, construction of these brine extraction/injection wells would be subject to subsequent review by the County and could require further environmental review to ensure compliance with CEQA.

## 3.8.6 Enforcement Authority

### Summary of Issues Raised by Commenters

- The monitoring should be conducted by a third party not associated with the Project.
- Members of the TRP would have a conflict of interest or that more third parties, such as the USGS or NPS, should be represented.

### Response

Commenters expressed various concerns regarding potential conflicts of interest regarding the implementation of the Draft GMMMP. The concerns were focused on (1) the Fenner Valley Mutual Water Company (FVMWC) conducting the monitoring for their own Project, and (2) the composition of the Technical Review Panel (TRP). Commenters also expressed concern regarding compliance with the San Bernardino County Desert Groundwater Management Ordinance § 33.06552 and the role of the County of San Bernardino.

#### ***Fenner Valley Mutual Water Company***

FVMWC is a California mutual water company formed for the purpose of delivering water from the Project to its members at cost. Outstanding membership shares are available for issuance to all Project participants, with the largest member being SMWD. Cadiz Inc. will not own shares in FVMWC. FVMWC, through its managing member SMWD, will operate the Project. Pursuant to the Updated GMMMP, FVMWC would assess technical data and responsive actions, propose refinements to the Management Plan and corrective measures regarding compliance with the provisions of the Management Plan, and prepare and submit various annual and periodic technical reports, all in consultation with the TRP and subject to the oversight of the County.

The Updated GMMMP would require the FVMWC to prepare annual and 5-year reports, summarizing all of the acquired data, evaluating the data to verify the aquifer response is as predicted, and providing recommendations. As more fully described in the Updated GMMMP, in the event that an action criteria is exceeded, FVMWC would be required to evaluate the event and make recommendations for corrective action to the TRP and the County, whose responsibilities are described below.

### ***Technical Review Panel***

Under the Updated GMMMP, the TRP would have the responsibility to review and monitor information generated under the GMMMP and issue recommendations, as needed. The TRP would also implement studies to assist in evaluating the migration of the saline-freshwater interface or the occurrence of land subsidence, as appropriate, and also review all annual and 5-year reports.

As described in the Updated GMMMP (Final EIR Vol. 7, Appendix B1 Updated GMMMP, Section 8), the TRP would be comprised of one technical representative appointed by the SMWD, one technical representative appointed by the County, and one technical representative jointly selected by the SMWD and the County. As a result, only 1 of three members of the TRP would be selected by FVMWC (and Cadiz Inc. would have no role in the selection process). In addition and as noted above, all three members of the TRP would possess professional technical qualifications appropriate to the tasks of the TRP (e.g., state certifications in engineering, hydrology, or geology) and would be required to have a minimum of ten years professional experience working in the groundwater field. The County could, at its sole discretion, select a technical representative from the USGS, the NPS, or the BLM for its representative. In addition, the County has an equal say in the selection of the second representative.

The TRP would review monitoring data, analyze action criteria, and make recommendations by consensus to the County concerning necessary corrective action. For the benefit of the County, if the TRP members do not reach a consensus, the TRP report must include the conclusions, reasons and evidence of the conflicting approaches. Moreover, if the TRP and FVMWC were to dispute the appropriate response to a triggering event, both would submit their independent recommendations to the County for its final determination. See Final EIR, Vol. 7, Appendix B1 Updated GMMMP, Figure 6-1 for a flow chart of the process.

Finally, SMWD will, as lead agency, have the full rights to enforce the MMRP, including failure to comply with those provisions of the Updated GMMMP which are also contained in Mitigation Measures **AQ-5**, **GEO-1**, **HYDRO-2**, **HYDRO-3**, and **MIN-1**. Because compliance with the Management Plan is a condition of SMWD's approval of the Project, SMWD in its discretion, will also consider the findings and actions taken or recommended by FVWC and the TRP, and will exercise its own independent judgment concerning whether the triggering of the action criterion is attributable to Project operations, whether the triggering of the action criterion involves a potential adverse impact or Undesirable Result, and to determine the appropriate corrective measure(s) necessary to avoid or mitigate the potential adverse impact or Undesirable Result. If SMWD determines that appropriate corrective measure(s) are necessary to avoid or mitigate the potential adverse impact or Undesirable Result but the County does not, SMWD WILL independently impose those corrective measures it determines necessary to avoid adverse impacts to critical resources or Undesirable Results provided that independent enforcement by SMWD shall be subject to the same procedural requirements and remedies applicable as if the County were enforcing the Management Plan, including the dispute resolution procedure set forth in the GMMMP and May 11, 2012 MOU.



### ***Role of County of San Bernardino and the Desert Groundwater Management Ordinance***

The County exercises its management authority over County groundwater resources through the Desert Groundwater Management Ordinance. The proposed Project lies within the unincorporated desert area of eastern San Bernardino County, where groundwater production is regulated under the County Ordinance (Ordinance). (San Bernardino Code §§ 33.06551 et seq.). The Ordinance provides an exclusion for the operation of groundwater wells where the operator has developed a groundwater management, monitoring and mitigation plan approved by the County that is consistent with guidelines developed by the County and the County and the operator have executed a memorandum of understanding that complies with the provisions of the Ordinance. (San Bernardino Code §33.06552(b)(1)). Because approval of a groundwater management plan is necessary to qualify the Project for exclusion from the Ordinance and is a discretionary action, the County's decision is subject to CEQA with the County acting as a responsible agency. SMWD, the County, Cadiz Inc., and FVMWC entered into the May 11, 2012 MOU to establish the framework for working together to finalize the GMMMP consistent with CEQA. The MOU is a first step, and it does not obligate SMWD to proceed with the Project or to presume that the environmental documentation for the Project will be certified, nor does it require the County to approve the GMMMP. No obligation included in the MOU is binding on SMWD or the County until such time as the District and County complete their respective environmental reviews of the Project and approve the Project and the GMMMP. The Updated GMMMP is intended to be one of the steps needed to qualify for an exclusion from the permitting requirements of the Ordinance, pursuant to San Bernardino Code section 33.06552.

The County is a “third party” because the County exercises its independent management authority over County groundwater resources through its Ordinance. Under the Updated GMMMP, the County would be authorized to fully consider the findings and actions taken or recommended by FVMWC and the TRP. When issuing its final determination as to whether FVMWC’s assessment of the triggering of the action criteria, and responsive actions taken, are appropriate, the County could independently review and analyze all available technical data as well as the recommendations of experts within the TRP. As noted above, the County could select a representative from NPS, USGS, or the BLM to sit on the TRP, so long as the individual met the technical qualifications for the position.