
SECTION 7 ACTION CRITERIA, DECISION-MAKING PROCESS AND CORRECTIVE MEASURES

This Management Plan identifies specific quantitative criteria (action criteria) that will “trigger” review to determine whether the measured change is attributable to the project operations⁵, and if so, which specific corrective measures would be implemented to avoid adverse impacts to critical resources. It is the intent of this Management Plan to identify deviations from natural conditions at monitoring features as early as possible in order to identify and prevent the occurrence of adverse impacts to critical resources as a result of project operations. A decision-making process has been developed, which outlines the process to be followed in the event that an action criterion is exceeded or when BLM considers refinements to the Management Plan. Finally, potential corrective measures to be implemented, if appropriate, are identified. Critical resources, action criteria, the decision-making process, and potential corrective measures are discussed below and summarized in Table 4.

The initial action criteria and corrective measures presented in this Management Plan are considered conservative and may be refined throughout the term of the Cadiz Project. Metropolitan would have the discretion to propose refinements to the action criteria and monitoring network. However, any such refinement would occur in accordance with the terms of this Management Plan. If Metropolitan proposes a refinement to action criteria or monitoring features, it will submit a written proposal describing the refinement along with supporting data and materials to the BLM Authorized Officer. The BLM Authorized Officer will make a decision regarding the proposed refinement in accordance with the decision-making process described in Section 10. Action criteria are intended to be used as predictors of potential impacts to critical resources, and exceedance of these criteria does not necessarily constitute an impact to critical resources. The water resources models and air quality analysis methodologies developed during the pre-operational and operational phases of the project will be used, in conjunction with measured data, to evaluate and refine action criteria and the monitoring network.

The decision-making process followed in this Management Plan, if an action criterion is exceeded or when BLM considers refinements to the Management Plan, is illustrated in Figure 10 and described in detail as follows. If an action criterion (defined in Sections 7.1 through 7.4) were exceeded, the decision-making process would be initiated. Metropolitan will promptly inform the BLM Authorized Officer that an action criterion has been exceeded. The BLM Authorized Officer will then inform the TRP that an action criterion has been exceeded.

Metropolitan will make an assessment to determine whether the measured change is attributable to project operations. If Metropolitan determines that the change is not attributable to project operations, it would make no change to project operations and submit the results of its assessment to the BLM Authorized Officer. If Metropolitan determines that the change is attributable to project operations, it will assess whether the measured change is a precursor or predictor of a potential adverse impact. If Metropolitan determines that the measured change is not a precursor or predictor of a potential adverse impact, it would make no change to project operations and may implement verification monitoring and/or propose refinements to the Management Plan. Such refinements may include modifications of the monitoring network (e.g. location, frequency, etc.) and the action criteria. Metropolitan will submit the results of its assessment to the BLM Authorized Officer. If Metropolitan proposes a refinement to action criteria or monitoring features, it will submit a written proposal describing the refinement along with supporting data and materials to the BLM Authorized Officer. The BLM Authorized Officer will make a decision

⁵ ‘Attributable to project operations’ as used in this document includes both the water use by the Cadiz Project and Cadiz Valley agricultural development.

**TABLE 4
SUMMARY OF ACTION CRITERIA, IMPACTS AND CORRECTIVE MEASURES**

Potential Impact	Method of Measurement	Triggers (Action Criteria)	Corrective Measures
Adverse Impacts to Springs	Groundwater Observation Wells (S-Series Wells)	Measured Water Level Change in Excess of 1 ft in Any S-Series Observation Wells	Modification of Project Extraction Operations to Prevent Adverse Impacts.
Adverse Impacts to Indigenous Groundwater Quality from Spreading Colorado River Water	CRW Sample Collection/Analysis at Lake Havasu	Exceedance of 1,000 mg/L TDS Level of Colorado River Water During Periods When Water is Being Delivered to the Spreading Basins.	Compliance with California RWQCB, Colorado River Basin Region Basin Plan, Curtail Putting CRW into Storage, or Provide Treatment Before Recharging.
Adverse Impacts to Wells Owned by Neighboring Land Owners	Groundwater Observation Wells	Written Complaint Stating Adverse Impacts to Yields and/or Increased Pumping Costs and/or Degraded Water Quality in Wells Owned by Neighboring Land Owners	Deepen Well / Improve Well Efficiency. Blend Impacted Well Water with Another Local Source Modify Project Storage and Withdrawal Operations. Construct Replacement Wells.
Land Subsidence	Benchmark Stations; InSAR (if warranted); Extensometers (if warranted)	Elevation Changes of Greater than 0.5 ft within the Project Area	Repair Damaged Structures. Modification of Program Wellfield Operations to Halt Aquifer Compaction.
Liquefaction	Groundwater Observation Wells	Static Groundwater Levels Measure Less than 50 ft Below Ground Surface Outside a Radius of 500 ft from the Boundary of the Project Spreading Basins	Modify Project Operations to Lower Groundwater Levels Such That Minimum Depth to Static Groundwater is Greater Than 50 ft. Outside a Radius of 500 ft from the Boundary of the Project Spreading Basins.
Hydrocompaction	Benchmark Stations	Tangible Damage (3 ft Drop in Elevation) in the Immediate Vicinity of the Project Spreading Basins	Repair or Replace Damaged Structures

**TABLE 4
SUMMARY OF ACTION CRITERIA, IMPACTS AND CORRECTIVE MEASURES (CONTINUED)**

Potential Impact	Method of Measurement	Triggers (Action Criteria)	Corrective Measures
Induced Flow of Lower-Quality Water from Bristol and Cadiz Dry Lakes	Groundwater Observation Wells (Cluster Wells at Dry Lakes)	TDS Concentration Changes in Excess of 25% of Background Concentrations in Cluster Wells at the Margin of the Dry Lakes	Modification of Project Storage and Extraction Operations to Re-establish the Natural Hydraulic Gradient and Background TDS Concentrations at the Margins of the Dry Lakes.
Adverse Impacts to Brine Resources Underlying Bristol and Cadiz Dry Lakes	Groundwater Observation Wells (Cluster Wells at Dry Lakes)	TDS Concentration Changes in Excess of 25% of Background Concentrations in Cluster Wells at the Margins of the Dry Lakes and/or Brine Level Changes of more than 1 ft Above/Below Static Levels in Cluster Wells on the Dry Lakes	Modification of Project Storage and Extraction Operations to Re-establish the Natural Hydraulic Gradient in and at the Margins of the Dry Lakes.
Mobilization of Wind-Blown Dust at Bristol and Cadiz Dry Lakes	Groundwater Observation Wells (Cluster Wells at Dry Lakes), ET Stations (with Soil Moisture Sensors), Open-air, Nephelometers, Digital Cameras, Surface Water Staff Gages	Water Level Changes of more than 0.5 feet Below Static Water Levels in Wells at ET Stations on the Dry Lakes	Modification of Project Storage and Extraction Operations to Re-establish the Natural Hydraulic Gradient in and at the Margins of the Dry Lakes.

regarding the proposed refinement in accordance with the decision-making process described in Section 10.

If Metropolitan determines that the measured change is a precursor or predictor of a potential adverse impact, it will identify and implement the appropriate corrective measures. Metropolitan will promptly inform the BLM Authorized Officer of the result of its assessment and the corrective measures that it implemented.

After receiving the results of Metropolitan's assessment if an action criterion is exceeded or when BLM considers refinements to the Management Plan, the BLM Authorized Officer will, if appropriate, promptly notify the TRP by telephone or email, to arrange for the TRP to convene. Convening the TRP may include face-to-face meetings, telephone conferencing, or video conferencing.

The TRP would review Metropolitan's assessment, proposed refinements to the Management Plan, and corrective measures. If the TRP agreed with Metropolitan's assessment, proposed refinements to the Management Plan, and corrective measures, the TRP would recommend to the BLM Authorized Officer to accept them. If the TRP disagreed with Metropolitan's assessment, proposed refinements to the Management Plan, and/or corrective measures, the TRP would recommend to the BLM Authorized Officer that changes be made. Such changes may include: (1) verification monitoring; (2) refinements to the Management Plan; (3) implementation of corrective measures including modification of project operations; and/or (4) modification of the corrective measures that have been implemented by Metropolitan. If consensus within the TRP could not be reached regarding Metropolitan's assessment, proposed refinements to the Management Plan, and corrective measures, all differing opinions and recommendations would be forwarded to the BLM Authorized Officer.

After taking into consideration input from Metropolitan and from the TRP, when requested, the BLM Authorized Officer will determine whether Metropolitan's assessment, proposed refinements to the Management Plan, and/or corrective measures are in accordance with the Management Plan, or determine that other action is required to enforce the terms and conditions of any right-of-way grant(s) issued for the Cadiz Project facilities. The BLM Authorized Officer will make any decision regarding proposed refinements in accordance with the decision-making process described in Section 10. In accordance with legal requirements and BLM policies, the BLM Authorized Officer may provide public notice prior to making any final decisions. Decisions of the BLM Authorized Officer are subject to appeal to the Interior Board of Land Appeals (IBLA) in accordance with the regulations governing such appeals under Title 43 Code of Federal Regulations Part 4.

7.1 SPRINGS

7.1.1 POTENTIAL FOR IMPACTS TO SPRINGS IN THE MOJAVE NATIONAL PRESERVE AND BLM MANAGED LANDS IN THE AFFECTED WATERSHEDS

To avoid adverse impacts to springs within the Fenner Valley and Orange Blossom Wash watersheds or groundwater levels beneath the Mojave National Preserve as a result of project operations, and to understand the connection between springflow and groundwater; monitoring of springs and groundwater levels will be conducted as follows: Approximately eight springs (the number of springs may be evaluated to increase or decrease the recommended number) will be selected for long-term monitoring (based on pre-operational field reconnaissance). In addition, the S-Series observation wells will be monitored continuously throughout the term of the Cadiz Project to ensure protection of the springs by measuring groundwater level impacts from project operations and to demonstrate that no groundwater level declines reach the Mojave National Preserve and no impact to springs occurs on BLM managed lands.

Action Criteria:

The decision-making process will be initiated if the action criteria are exceeded. The action criteria are a measured groundwater level change in excess of 1 foot in any of the S-Series observation wells. If such a groundwater level change occurs, the decision-making process will be initiated (Figure 10).

Decision-Making Process (See Figure 10):

If the action criteria are exceeded, the decision-making process will continue as follows:

- Metropolitan will inform the BLM Authorized Officer, and determine if measured changes in groundwater levels are attributable to project operations.
- If groundwater level changes exceed the action criteria in any of the S-Series observation wells and are not attributable to project operations (as indicated by groundwater level distributions throughout the entire monitoring network and other factors), then no change to project operations would be required, and Metropolitan may propose that the action criteria or monitoring network be modified.
 - a) If groundwater level changes exceed the action criteria in any of the S-Series observation wells and are attributable to project operations, an assessment would be made to determine whether this change will result in an adverse impact based on the Management Plan groundwater models and other data collected and measured in accordance with the Management Plan.

If no adverse impact were identified, potential actions would include:

- a) No action, or
 - b) Refinement of the location and/or magnitude of the action criteria, or
 - c) Verification monitoring, or
 - d) Revision of the monitoring frequency or location at long-term monitoring springs.
- If groundwater level changes exceeded the action criteria in any of the S-Series observation wells and were determined to be attributable to project operations, and the groundwater level change would result in an adverse impact, then corrective measures would be implemented. An adverse impact includes: (1) the determination that this groundwater level change will cause a reduction in the flow of any spring based on the Management Plan groundwater models and other data collected and measured in accordance with the Management Plan; or (2) the determination that this groundwater level change will cause groundwater level declines at the boundary of the Mojave National Preserve based on the Management Plan groundwater models and other data collected and measured in accordance with the Management Plan.
 - Metropolitan will inform the BLM Authorized Officer of its assessment and the corrective measures that were implemented, if any (see Figure 10). BLM will seek appropriate technical assistance from the TRP as necessary to complete BLM's evaluation of Metropolitan's compliance with the provisions of the Management Plan. The TRP would provide recommendations to the BLM Authorized Officer as described in Section 9. The BLM Authorized Officer would enforce the terms and conditions of the right-of-way grant(s) in accordance with the process described in Section 10.

Corrective Measures:

Corrective measures that would be implemented include:

Modification of project operations to prevent adverse impacts. Modifications to project operations would include one or more of the following: (a) reduction in pumping from project wells, (b) revision of pumping locations within the project wellfield, (c) stoppage of groundwater extraction for a duration necessary to correct the predicted impact, or (d) delivery of Colorado River water, if available, to the project spreading basins.

Responsible Party:

Metropolitan Water District of Southern California

7.2 AQUIFER SYSTEM**7.2.1 POTENTIAL IMPACTS TO INDIGENOUS GROUNDWATER QUALITY DUE TO PROJECT OPERATIONS**

Pursuant to California law, the California Regional Water Quality Control Board, Colorado River Basin Region adopted a Water Quality Control Plan in 1994 (Basin Plan) which identifies surface waters and groundwater within its geographical jurisdiction, existing and potential future beneficial uses of those waters, and water quality objectives to protect the beneficial uses of the waters. The Basin Plan identifies that the Bristol groundwater hydrologic unit has municipal, industrial and agricultural beneficial uses and that the Cadiz groundwater hydrologic unit has municipal and industrial beneficial uses.

The Basin Plan also indicates that Colorado Regional Board's goal is to maintain the existing water quality of all nondegraded groundwater basins. Additionally, State Board policy states that when existing water quality is better than the quality established in policies, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with the maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less that described in the policies (Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California). The State of California Department of Health Services (DHS) has identified a secondary water quality standard of 1,000 mg/L for TDS in drinking water.

Action Criteria:

The decision-making process will be initiated if the action criteria are exceeded. The action criteria is the exceedance of the DHS secondary drinking water quality standard of 1,000 mg/L TDS level during periods when water is being delivered to the spreading basins. During storage operations, the quality of Colorado River water in the CRA would be tested and analyzed weekly by Metropolitan at Lake Havasu. The analysis will be performed to ensure that storage of Colorado River water in the aquifer will not impair the water quality of the indigenous groundwater for beneficial use. The Regional Water Quality Control Board has identified municipal, industrial and agricultural uses as beneficial uses of the basin.

Future updates of the applicable Basin Plan may alter the requirements that Cadiz Project operations must meet. Should this occur, the decision-making process would be initiated to ensure compliance with the revised requirements.

Decision-Making Process:

If the water quality tests of Colorado River water indicate that it exceeds the DHS secondary drinking water quality standard of 1,000 mg/L TDS, the decision-making process will be implemented as follows:

- Metropolitan will make an assessment to determine whether the quality of the Colorado River water will constitute an adverse impact to the aquifer if delivered for storage. Adverse impact includes the impairment of the water quality of the indigenous groundwater for the beneficial use for municipal, industrial and agricultural purposes, as determined by the California Regional Water Quality Control Board, Colorado River Basin Region.
- Metropolitan will inform the BLM Authorized Officer of its assessment, and the corrective measures that were implemented, if any, to comply with the Regional Water Quality Control Board's Basin Plan.

Corrective Measures:

Corrective measures that would be implemented include:

1. Curtail delivery of Colorado River water to the spreading basins, or
2. Treat Colorado River water prior to putting it into storage, or
3. Implement other corrective measures as required by the California Regional Water Quality Control Board, Colorado River Basin Region.

Responsible Party:

Metropolitan Water District of Southern California

7.2.2 POTENTIAL IMPACTS TO WELLS OWNED BY NEIGHBORING LANDOWNERS DUE TO PROJECT OPERATIONS

It is the intent of the project to operate without impacts to wells owned by neighboring landowners in the vicinity of the project area. To avoid such potential impacts, the groundwater monitoring network will include wells located near such landholdings. Groundwater levels will be monitored on a monthly basis. Water quality will be monitored on a quarterly basis during the pre-operational phase and annually thereafter during the term of the Cadiz Project.

Action Criteria:

The decision-making process will be initiated if the action criteria are exceeded. The action criteria are written complaints regarding decreased groundwater production yield, degraded water quality, or increased pumping costs submitted by neighboring landowners.

Decision-Making Process:

If a written complaint is received, the decision-making process will be implemented as follows:

- Metropolitan will arrange for an interim supply of water to the impacted party and inform the BLM Authorized Officer of the receipt of a written complaint.
- Metropolitan will determine if water level changes, decreased yields, increased pumping costs, and/or degraded water quality in neighboring landowner wells are attributable to project operations.

- If water level changes, decreased yields, increased pumping costs and/or degraded water quality in neighboring landowner wells are not attributable to project operations, then no action would be taken and Metropolitan would discontinue its arrangement to provide water.
- If water level changes, decreased yields, increased pumping costs and/or degraded water quality in neighboring landowner wells are attributable to project operations, then further corrective measures would be implemented.
- Metropolitan will inform the BLM Authorized Officer of its assessments and the corrective measures that were implemented, if any (see Figure 10). BLM will seek appropriate technical assistance from the TRP as necessary to complete BLM's evaluation of Metropolitan's compliance with the provisions of the Management Plan. The TRP would provide recommendations to the BLM Authorized Officer as described in Section 9. The BLM Authorized Officer would enforce the terms and conditions of the right-of-way grant(s) in accordance with the process described in Section 10.

Corrective Measures:

Upon receipt of the written complaint, and during the decision-making process, Metropolitan will arrange for an interim supply of water to the impacted party as necessary. Additional corrective measures that would be implemented include one or more of the following:

1. Deepen or otherwise improve the efficiency of the impacted well(s); or
2. Blend impacted well water with another local source; or
3. Construct replacement wells; or
4. Modify project operations until adverse impacts are no longer present at the impacted well(s). Modifications to project operations would include one or more of the following: (a) reduction in pumping from project wells, (b) revision of pumping locations within the project wellfield, (c) stoppage of groundwater extraction for a duration necessary to correct the predicted impact, or (d) delivery of Colorado River water, if available, to the project spreading basins.

Responsible Party:

Metropolitan Water District of Southern California

7.2.3 POTENTIAL FOR LAND SUBSIDENCE

Twenty benchmarks will be established and surveyed on an annual basis to identify and quantify potential subsidence within the project area (see Figure 3-5). As a result of the land surface subsidence monitoring surveys, an extensometer well may be constructed in areas of known or anticipated subsidence. The extensometer well, if constructed, would verify if the land surface changes (identified from land surveys supplemented, if necessary, with semi-annual InSAR satellite data) were due to (1) subsidence due to groundwater withdrawal or (2) other mechanisms (e.g. regional tectonic movement). Use of predictive modeling of subsidence due to groundwater withdrawal would aid in this analysis.

Action Criteria:

The decision-making process will be initiated if the action criteria are exceeded. The action criteria is a change in the ground surface elevation of more than 0.5 ft within the project area.

Decision-Making Process:

If the action criteria are exceeded, the decision-making process will be implemented as follows:

- Metropolitan will inform the BLM Authorized Officer and determine if the subsidence is attributable to project operations. Metropolitan may construct an extensometer well near the center of the subsidence area, or utilize InSAR surveys as needed to determine if the subsidence is non-recoverable compaction.
- If land surface elevation changes equal to or in excess of the action criteria are not attributable to project operations, then no action would be required, and Metropolitan may propose refinement of the action criteria or monitoring network.
- If land surface elevation changes equal to or in excess of the action criteria are attributable to project operations, then an assessment will be made to determine whether the subsidence constituted a potential adverse impact to the aquifer. Adverse impact includes the determination that there will be damage to structures as a result of differential settlement or fissuring, or general subsidence sufficient to alter natural drainage patterns or cause damage to structures, or a non-recoverable loss of aquifer storage capacity that affects the beneficial uses of the basin. If no such impacts were identified, potential actions may include:
 - a) No action, or
 - b) Refinement of the action criteria, or
 - c) Verification monitoring, or
 - d) Revision of the benchmark survey monitoring frequency
- If land surface elevation changes equal to or in excess of the action criteria were determined to be attributable to project operations and the changes constituted a potential adverse impact in the project area, then corrective measures would be implemented.
- Metropolitan will inform the BLM Authorized Officer of its assessments and the corrective measures that were implemented, if any (see Figure 10). BLM will seek appropriate technical assistance from the TRP as necessary to complete BLM's evaluation of Metropolitan's compliance with the provisions of the Management Plan. The TRP would provide recommendations to the BLM Authorized Officer as described in Section 9. The BLM Authorized Officer would enforce the terms and conditions of the right-of-way grant(s) in accordance with the process described in Section 10.

Corrective Measures:

Corrective measures that would be implemented include:

1. Modification of wellfield operations to halt aquifer compaction. Modifications to project operations would include one or more of the following: (a) reduction in pumping from project wells, (b) revision of pumping locations within the project wellfield, or (c) stoppage of groundwater extraction for a duration necessary to correct the predicted impact.
2. Repair any structures damaged as a result of subsidence attributable to project operations.

Responsible Party:

Metropolitan Water District of Southern California

7.2.4 POTENTIAL FOR INCREASED RISK OF LIQUEFACTION RELATED TO PROJECT SPREADING OPERATIONS

Groundwater levels will be monitored continuously in project area well clusters (Features 5 and 6) in the vicinity of the project spreading basins.

Action Criteria:

The decision-making process will be initiated if the action criteria are exceeded. The action criteria is a rise in groundwater levels, to within 50 feet of the ground surface outside a radius of 500 ft from the boundary of the project spreading basins. If such a change in groundwater levels occurs, the decision-making process will be initiated. (Figure 10)

Decision-Making Process:

If the action criteria were exceeded, the decision-making process will be implemented as follows:

- Metropolitan will inform BLM Authorized Officer, and determine if changes in groundwater levels are attributable to project operations.
- If a water level rise equals or exceeds the action criteria in the project area observation well clusters but is not attributable to project operations, then no change to project operations would be required and Metropolitan may propose refinement of the action criteria or monitoring network.
- If water level rise equals or exceeds the action criteria in the project area observation well clusters and is attributable to project operations an assessment would be made to determine whether the water level rise constituted an increased risk of liquefaction. If no such adverse impact was identified, potential actions would include:
 - a) No action, or
 - b) Refinement of the action criteria, or
 - c) Verification monitoring, or
 - d) Revision of the monitoring frequency or location of monitoring wells.
- If water level rise in the project area observation well clusters is determined to be attributable to project operations, and the levels constitute an increased risk of liquefaction, then corrective measures will be implemented.
- Metropolitan will inform the BLM Authorized Officer of its assessments and the corrective measures that were implemented, if any (see Figure 10). BLM will seek appropriate technical assistance from the TRP as necessary to complete BLM's evaluation of Metropolitan's compliance with the provisions of the Management Plan. The TRP would provide recommendations to the BLM Authorized Officer as described in Section 9. The BLM Authorized Officer would enforce the terms and conditions of the right-of-way grant(s) in accordance with the process described in Section 10.

Corrective Measures:

Corrective measures that would be implemented include:

Modification of project operations to lower groundwater levels beneath the spreading basins such that the minimum depth to static groundwater was equal to or below 50 feet outside a radius of 500 feet from the boundary of the project spreading basins.

Responsible Party:

Metropolitan Water District of Southern California

7.2.5 POTENTIAL FOR HYDROCOMPACTION RELATED TO PROJECT SPREADING OPERATIONS

Benchmarks will be established and surveyed on an annual basis to identify and quantify potential hydrocompaction in the immediate vicinity of the project spreading basins.

Action Criteria:

The decision-making process will be initiated if the action criteria are exceeded. The action criteria is a 3 foot drop in land surface elevation in the immediate vicinity of the project spreading basins. If such changes in land surface elevation changes are measured, the decision-making process will be initiated (see Figure 10).

Decision-Making Process:

If the action criteria are exceeded, the decision-making process will be implemented as follows:

- Metropolitan will inform BLM Authorized Officer, and determine if the land surface elevation changes are attributable to project operations.
- If land surface elevation changes equal to or in excess of the action criteria are not attributable to project operations, then no change in project operations would be required, and Metropolitan may propose refinement of the action criteria or monitoring network.
- If land surface elevation changes equal to or in excess of the action criteria are attributable to project operations, an assessment would be made to determine whether the subsidence constituted a potential adverse impact to manmade structures in the project area. If no such impacts were identified, potential actions may include:
 - a) No action, or
 - b) Refinement of the action criteria, or
 - c) Verification monitoring, or
 - d) Revision of the benchmark survey monitoring frequency.
- If land surface elevation changes equaling or exceeding the action criteria are determined to be attributable to project operations and to constitute a potential adverse impact to manmade structures in the immediate vicinity of the project spreading basins, then corrective measures will be implemented.
- Metropolitan will inform the BLM Authorized Officer of its assessment and corrective measures that were implemented, if any (see Figure 10). BLM will seek appropriate technical assistance from the TRP as necessary to complete BLM's evaluation of Metropolitan's compliance with the provisions of the Management Plan. The TRP would provide recommendations to the BLM Authorized Officer as described in Section 9. The BLM Authorized Officer would enforce the terms and conditions of the right-of-way grant(s) Metropolitan in accordance with the process described in Section 10.

Corrective Measures:

Corrective measures that would be implemented include:

1. Repair damage to project spreading basins and related appurtenances due to hydrocompaction.
2. Repair or replace any other facilities in the immediate vicinity of the project spreading basins damaged by hydrocompaction, attributable to project operations.

Responsible Party:

Metropolitan Water District of Southern California

7.2.6 POTENTIAL FOR INDUCED FLOW OF LOWER-QUALITY WATER FROM BRISTOL AND CADIZ DRY LAKES

A network of “cluster type” observation wells will be established between the project wellfield and the margins of Bristol and Cadiz dry lakes (see Figures 4 and 5). Groundwater TDS concentrations in the well clusters will be monitored on a quarterly basis during the pre-operational phase of the Cadiz Project, semi-annually throughout the operational phase and annually during the post-operational phase of the project.

Action Criteria:

The decision-making process will be initiated if the action criteria are exceeded. The action criteria is a change in TDS concentration in excess of 25% of background concentrations in the cluster wells at the margin of the dry lakes. If such a TDS change is measured, the decision-making process will be initiated.

Decision-Making Process:

If the action criteria are exceeded, the decision-making process will be implemented as follows:

- Metropolitan will inform the BLM Authorized Officer and determine if the changes are attributable to project operations.
- If groundwater TDS concentration changes equal to or in excess of the action criteria in the observation well clusters at the margins of the dry lakes are not attributable to project operations, then no change in project operations would be required and Metropolitan may propose refinement of the action criteria.
- If groundwater TDS concentration changes equal to or in excess of the action criteria in the observation well clusters at the margins of the dry lakes are attributable to project operations, then an assessment will be made whether the TDS concentration changes constituted a potential adverse impact to (1) the aquifer system, (2) mining operations, or (3) project area production wells. Adverse impact includes the determination that beneficial use of the groundwater basin will be impaired as determined under the policies of the Regional Water Quality Control Board, Colorado River Basin Region in effect during the Cadiz Project. If no such impacts were identified, potential actions may include:
 - a) No action, or
 - b) Refinement of the action criteria, or
 - c) Verification monitoring, or
 - d) Revision of the monitoring frequency of the observation well clusters at the margins of the dry lakes.

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- If groundwater TDS changes equal to or in excess of the action criteria in observation well clusters at the margins of the dry lakes are determined to be attributable to the project and that the changes constituted a potential adverse impact to (1) the aquifer system, (2) mining operations, or (3) project area production wells, then corrective measures will be implemented.
- Metropolitan will inform the BLM Authorized Officer of its assessment and corrective measures that were implemented, if any (see Figure 10). BLM will seek appropriate technical assistance from the TRP as necessary to complete BLM's evaluation of Metropolitan's compliance with the provisions of the Management Plan. The TRP would provide recommendations to the BLM Authorized Officer as described in Section 9. The BLM Authorized Officer would enforce the terms and conditions of the right-of-way grant(s) in accordance with the process described in Section 10.

Corrective Measures:

Corrective measures that would be implemented include:

Modification of project storage and extraction operations to reestablish the natural hydraulic gradient and background TDS concentrations at the margins of Bristol and Cadiz dry lakes. Modifications to project operations would include one or more of the following: (a) reduction in pumping from project wells, (b) revision of pumping locations within the project wellfield, (c) stoppage of groundwater extraction for a duration necessary to correct the predicted impact, or (d) delivery of Colorado River water, if available, to the project spreading basins.

Responsible Party:

Metropolitan Water District of Southern California

7.3 BRISTOL AND CADIZ DRY LAKES

7.3.1 POTENTIAL FOR IMPACTS TO THE BRINE RESOURCES UNDERLYING BRISTOL AND CADIZ DRY LAKES

A network of "cluster type" observation wells will be established between the project wellfield and the margins of Bristol and Cadiz dry lakes (see Figures 4 and 5). Groundwater TDS concentrations in the well clusters will be monitored on a quarterly basis during the pre-operational phase of the project, semi-annually throughout the operational phase, and annually throughout the post-operational phase of the Cadiz Project. Groundwater levels will be monitored on a continuous basis throughout the term of the project.

Action Criteria:

The decision-making process will be initiated if action criteria are exceeded. The action criteria is a change in TDS concentration in excess of 25% of background concentrations, or a change in water or brine levels of 1 ft from pre-operational static levels in the cluster wells at the margins of the dry lakes. If such a TDS or water/brine level change is measured, the decision-making process will be initiated.

Decision-Making Process:

If the action criteria are exceeded, the decision-making process will be implemented as follows:

- Metropolitan will inform the BLM Authorized Officer, and determine whether the change in TDS concentrations or water/brine level change is attributable to project operations.

- If groundwater TDS concentration or water/brine level changes equal to or in excess of the action criteria in the observation well clusters at the margins of the dry lakes are not attributable to project operations, then no change to project operations would be required, and Metropolitan may propose refinement of the action criteria.
- If groundwater TDS concentration or water/brine level changes equal to or in excess of the action criteria in the observation well clusters at the margins of the dry lakes are attributable to project operations, then an assessment will be made to determine whether the TDS concentration and/or water/brine level changes constituted a potential adverse impact to brine operations on the dry lakes. Adverse impact includes changes in brine chemistry or yields from existing brine production wells or trenches attributable to project operations. If no such impacts were identified, potential actions may include:
 - a) No action, or
 - b) Refinement of the action criteria, or
 - c) Verification monitoring, or
 - d) Revision of the monitoring frequency at the observation well clusters at the margins of the dry lakes,
- If groundwater TDS concentration or water/brine level changes equal to or in excess of the action criteria in observation well clusters at the margins of the dry lakes are determined to be attributable to project operations and the changes constituted a potential adverse impact to brine operations on the dry lakes, then corrective measures will be implemented.
- Metropolitan will inform the BLM Authorized Officer of its assessment and corrective measures that were implemented, if any (see Figure 10). BLM will seek appropriate technical assistance from the TRP as necessary to complete BLM's evaluation of Metropolitan's compliance with the provisions of the Management Plan. The TRP would provide recommendations to the BLM Authorized Officer as described in Section 9. The BLM Authorized Officer would enforce the terms and conditions of the right-of-way grant(s) in accordance with the process described in Section 10.

Corrective Measures:

Corrective measures that would be implemented include:

Modification of Cadiz Project storage and extraction operations to re-establish the natural hydraulic gradient in and at the margins of the dry lakes. Modifications to project operations would include one or more of the following: (a) a reduction in pumping from project wells, (b) revision of pumping locations within the project wellfield, (c) stoppage of groundwater extraction for a duration necessary to correct the predicted impact, or (d) delivery of Colorado River water, if available, to the project spreading basins.

Responsible Party:

Metropolitan Water District of Southern California

7.4 AIR QUALITY

7.4.1 POTENTIAL IMPACTS TO AIR QUALITY DUE TO DUST MOBILIZATION FROM WATER-LEVEL DECLINES BENEATH BRISTOL AND CADIZ DRY LAKES

A network of “cluster type” observation wells will be established between the project wellfield and Bristol and Cadiz dry lakes (see Figures 4 and 5). Groundwater levels will be monitored on a continuous basis throughout the term of the project.

A pair of nephelometers, a digital camera, and a weather station will also be installed at each dry lake to collect data on ambient dust mobilization and wind speed and direction on the dry lakebeds.

Action Criteria:

The decision-making process will be initiated if the action criteria is exceeded. The action criteria is a change in groundwater levels of 6 inches from pre-operational static levels in the cluster wells on the dry lakebeds. If such a groundwater level change is measured, the decision-making process will be initiated.

Decision-Making Process:

If the action criteria are exceeded, the decision-making process will be implemented as follows:

- Metropolitan will inform the BLM Authorized Officer, and determine whether the change in groundwater levels is attributable to project operations.
- If groundwater level changes, equal to or in excess of the action criteria in the observation well clusters on the dry lakebeds are not attributable to Cadiz Project operations, then no change to project operation would be required, and Metropolitan may propose refinement the action criteria.

If groundwater level changes equal to or in excess of the action criteria in the observation well clusters on the dry lakebeds are attributable to project operations, then an assessment will be made to determine whether the groundwater level changes are accompanied by a decrease in soil moisture, and an adverse change in air quality at a dry lakebed attributable to project operations. This determination will be accomplished by comparing the groundwater level data with data for soil moisture at the lakebed surface, wind velocity data obtained from weather stations on the dry lakebeds, and with dust mobilization data obtained from the instrumentation installed upwind and downwind of Bristol and Cadiz dry lakebeds. Statistical analyses would be performed as described in Sections 6.4.1 and 6.4.2 to identify an adverse change in air quality. The changes in light extinction (a quantitative measurement of the light scattering component of visibility impairment) that can be detected by the instrumentation depend on the level of airborne particulate matter. In very clean air, changes of about 20% to 30% can be detected reliably. Changes in light extinction as small as 10% can be detected in air with higher particle concentrations. The differences between the downwind and upwind readings from the open-air nephelometers that can be reliably attributed to wind-mobilized particulate matter from the dry lakebed surfaces will be established during analyses of the baseline monitoring. An adverse change in air quality is defined as a measurable increase in seasonal dust mobilization, attributable to project operations, based on the analyses of baseline monitoring. If no such impacts are identified, potential actions may include:

- a) No action, or
- b) Refinement of the action criteria, or
- c) Verification monitoring, or
- d) Revision of the monitoring frequency at the observation well clusters on the dry lakebeds.

- If groundwater level changes equal to or in excess of the action criteria in observation well clusters on the dry lakebeds were determined to be attributable to project operations and the changes constituted a potential adverse impact to air quality at a dry lakebed, then corrective measures would be implemented.
- Metropolitan will inform the BLM Authorized Officer of its assessment and corrective measures that were implemented, if any (see Figure 10). BLM will seek appropriate technical assistance from the TRP as necessary to complete BLM's evaluation of Metropolitan's compliance with the provisions of the Management Plan. The TRP would provide recommendations to the BLM Authorized Officer as described in Section 9. The BLM Authorized Officer would enforce the terms and conditions of the right-of-way grant(s) in accordance with the process described in Section 10.

Corrective Measures:

Corrective measures that would be implemented include:

Modification of project storage and extraction operations to re-establish the natural hydraulic gradient in and at the margins of the dry lakes. Modifications to project operations would include one or more of the following: (a) reduction in pumping from project wells, (b) revision of pumping locations within the project wellfield, (c) stoppage of groundwater extraction for a duration necessary to correct the predicted impact, or (d) delivery of Colorado River water, if available, to the project spreading basins.

Responsible Party:

Metropolitan Water District of Southern California