

AMENDMENT TO AGREEMENT BETWEEN THE SEASIDE BASIN WATERMASTER AND RBF CONSULTING FOR PROFESSIONAL SERVICES

WHEREAS the SEASIDE BASIN WATERMASTER (hereinafter Watermaster) and RBF CONSULTING (hereinafter Consultant) entered into that certain Agreement Between the Seaside Basin Watermaster and RBF Consulting for Professional Services on April 18, 2007, (hereinafter Agreement);

WHEREAS Section IX titled CHANGES AND CHANGED CONDITIONS provides that any changes to the Agreement shall be documented by duly executed amendments to the Agreement; and

WHEREAS Watermaster and Consultant wish to amend the Agreement.

NOW THEREFORE, the Agreement is hereby amended as follows:

- A. This Amendment applies only to work performed by Consultant under the Agreement after July 31, 2007. Work performed by Consultant under the Agreement prior to that date is not affected by this Amendment.
- B. By deleting in its entirety **Exhibit A**, Scope of Services, and by substituting therefor the attached new **Amended Exhibit A**, Scope of Services.
- C. By deleting in its entirety **Exhibit B**, Fee Schedule, and by substituting therefor the attached new **Amended Exhibit B**, Fee Schedule.
- D. By deleting in its entirety **Exhibit C**, Work Schedule, and by substituting therefor the attached new **Amended Exhibit C**, Work Schedule.

In all respects other than as hereinabove expressly set forth the undersigned hereby ratifies the Agreement Between the Seaside Basin Watermaster and RBF Consulting for Professional Services executed on April 18, 2007, as amended on this the 17 day of October, 2007.

SEASIDE BASIN WATERMASTER

By: 
DEWEY EVANS
Watermaster Executive Officer

CONSULTANT

By: _____
RBF CONSULTING

AMENDED EXHIBIT A

**RBF Consulting
Seaside Groundwater Basin
Monitoring and Management Program
Phase I Work Plan**

The Seaside Basin Monitoring and Management Program (MMP) was developed by the Seaside Basin Watermaster Technical Advisory Committee (TAC) and adopted on May 17, 2006, and revised on September 5, 2006, to comply with the decision entered in the Seaside Groundwater Basin Adjudication (California American Water v. City of Seaside, Monterey County Superior Court, Case Number M66343) (hereinafter referred to as Decision). The MMP contains several primary tasks: 1) Basin Monitoring Well Construction Program; 2) Comprehensive Basin Production, Water Level and Water Quality Program; 3) Basin Management Program; and 4) Seawater Intrusion Program.

Phase 1 - Management and Monitoring Program Implementation

The first phase of the MMP Implementation includes both the Coastal Sentinel Work Plan authorized by the Watermaster Board on January 31, 2007, as well as additional tasks in the MMP that have been identified as priorities and prerequisite activities to subsequent phases. A summary of these tasks is described below, and a detailed scope of work, budget and schedule is included as Appendix A.

Monitor Well Construction

The Seawater Sentinel Work Plan has been reviewed in combination with the additional MMP Phase 1 tasks as well as with the Coastal Water Project (CWP) Aquifer Storage and Recovery (ASR) program to evaluate the coverage of existing and proposed monitoring well network.

Comprehensive Basin Production, Water Level and Water Quality Monitoring Program

All tasks described under this portion of the MMP are recommended to be performed at this time, as the development of a consolidated database of both existing and new data related to water production, water levels and water quality will be critical to Basin management. This effort will also provide the data and analysis necessary to identify the need, if any, for additional monitoring wells as identified in the MMP.

During the development of this MMP Implementation Plan, the TAC acknowledged the concerns expressed by the Laguna Seca property-owners and the City of Del Rey Oaks. This work effort will include the investigation of existing production wells or new wells that can be added to the Watermaster's monitoring network at key locations to provide more effective monitoring in the Laguna Seca and Southern Coastal Sub areas of the basin. This work will include recommendations for improved ground water level and ground water quality monitoring, as a means to provide data to enhance the current understanding of hydrogeologic conditions in these areas, and to support planned future water resources evaluation and simulation modeling efforts.

Basin Management

The Basin Management Program in the MMP calls for an action plan to optimize the Natural Safe Yield (also referred to as Maximum Perennial Yield) within the Coastal and Laguna Seca sub areas of the basin. Supplemental water supply projects are critical to achieving this goal. In Phase 1, other supplemental supply projects will be also analyzed and the review of the existing water production, level and quality data

will be instrumental in identifying the action plan strategy for Basin Management that will be further developed in Phase 2.

Under Phase 1, the decision was made by the Watermaster Committee to proceed with documentation of the "Durbin" model, in conjunction with Martin Feeney and Derrick Williams of Hydrometrics, the groundwater modeler on the RBF team. This model will provide an agreed upon model analysis for the Watermaster. Additional modeling needs will be determined during Phase 2 of the MMP Implementation Plan if key questions for Basin Management are identified that could be furthered through additional modeling.

Seawater Intrusion Contingency Program/ Establishing Baseline Seawater Intrusion

In addition to the monitoring planned for the proposed new sentinel wells, the Watermaster will continue to collect quarterly water quality data from the MPWMD existing coastal monitor wells under Phase 1 of the MMP. These data from the MPWMD coastal monitor wells will be instrumental in confirming baseline conditions and historical trends. Should seawater intrusion be detected at a coastal monitor or production well, steps will be implemented, following the protocols outlined in the MMP, to initiate the appropriate responsive actions

Based on the outcome of the Monitoring Well Construction Program and the Comprehensive Basin Production, Water Level and Water Quality Monitoring Program, the Seawater Intrusion Contingency Plan would be logically influenced by the Phase 1 data collection and analysis efforts. It is recommended that baseline water level contour mapping be prepared utilizing all available water level data, as well as developing baseline production data. Analyzing historical water quality data during Phase 1 serves two purposes: 1) it establishes baseline water quality; and 2) it identifies historical water quality trends.

Phase 2 - Management and Monitoring Program Implementation

Based on the results of the Phase 1 Monitoring Well Construction Program and the Comprehensive Basin Production, Water Level and Water Quality Monitoring Program, specific tasks for Phase 2 will be determined in the fourth quarter of 2007.

RBF Consulting Seaside Groundwater Basin Monitoring and Management Plan Phase I Scope of Work

The following scope of work has been developed to perform tasks necessary to carry out 1) Basin Monitoring Well Construction Program; 2) Comprehensive Basin Production, Water Level and Water Quality Program; 3) Basin Management Program; and 4) Seawater Intrusion Program.

MANAGEMENT

M.1

Program Administration

M. 1. a. Program Management Plan

No work shall be performed under this Task.

M. 1. b. Project Budget and Controls

Monthly invoicing, maintenance of internal budgets and schedules, management of subconsultants

M. 1. c. Assist with Board and TAC Agendas

No work shall be performed under this Task.

M. 1. d. Preparation and Attendance of Meetings

Prepare for and attend the following meetings:

- Five Technical Advisory Committee (TAC) meetings (August through December, 2007)
- Two Monitoring Database workgroup meetings, including preparation of agendas and meeting minutes to facilitate the meetings
- Two Seawater Intrusion work group meetings, including preparation of agendas and meeting minutes to facilitate the meetings

M. 1. e. Prepare Board/ TAC Status Updates and Reports

Provide Watermaster with monthly status reports indicating project progress, costs incurred, contract and construction cost trends, and problem identification and resolution. Provide assistance to the TAC in preparing technical summary reports and technical memoranda for the Watermaster Board.

M. 1. f.

Peer Review of Documents and Reports

Assist TAC and Watermaster with peer reviews of documents and reports prepared by various Watermaster entities, as requested.

M. 1. g. QA/QC

No work shall be performed under this Task.

IMPLEMENTATION

I. 1. Monitor Well Construction

I. 1. a. Coordination with Monitor Well Implementation Program

No work shall be performed under this Task.

I. 2 Comprehensive Basin Production, Water Level and Water Quality Monitoring Program Consolidated Seaside Basin Groundwater Resources Database

Groundwater resource monitoring within the Seaside Basin is currently being conducted by numerous entities. The programs consist of: Groundwater Production Monitoring; Groundwater Level Monitoring; Groundwater Quality Monitoring; Surface Water Monitoring; and Precipitation Monitoring.

For successful implementation of the Seaside Basin Monitoring Program, pertinent historical basic groundwater resource data obtained from the above-mentioned programs needs to be consolidated into a database to allow more efficient organization and data retrieval. The consolidated database will allow for simple identification of differences and discrepancies of datasets compiled by the numerous

entities. Data gaps will become evident as well. In addition, the consolidated database needs to allow pertinent groundwater data to be efficiently organized, managed and housed in a single location to facilitate: Ongoing data collection; Data storage and retrieval; Distribution of basic data to Watermaster members and interested parties; and, Preparation of annual and periodic reports to the Watermaster.

Characteristics of both existing wells and wells proposed as part of the Seaside Basin Monitoring Program will be notated in the database, including type, location, construction details and other pertinent information. MPWMD already maintains a groundwater database that contains some of the features described above. Determine if the MPWMD database should be expanded or if a new database should be created. Assist the Watermaster in the review of the existing MPWMD groundwater database to help determine whether it is feasible and economical to incorporate both the historical data and the ongoing data to be collected as part of the Seaside Basin Monitoring Program.

Coordination with the Watermaster is required in order to verify the adequacy of the existing database and ensure data requirements are met. Completion of the enhancement or development of a consolidated database will allow the review of the available groundwater resource data to determine discrepancies, differences, or data gaps.

Monitoring of Production Wells

As defined in Section D-5, Monitoring of Production Wells, of the RFP, the data to be collected by each owner and/or operator of inactive and active wells in the Basin shall be forwarded to the Watermaster for inclusion into the consolidated database.

I. 2. a. Basin Management Database Development

I. 2. a. 1. Coordination with Watermaster to Review Database.

No work shall be performed under this Task.

I. 2. a. 1. 1 Review of MPWMD Database to Catalog Historical Data

No work shall be performed under this Task.

I. 2. a. 1. 2 Review of MPWMD Database To Catalog Ongoing Data Collection

No work shall be performed under this Task.

I. 2. a. 2. Develop Scope of Work to Enhance or Develop New Groundwater Resource Database

No work shall be performed under this Task.

I. 2. a. 3. Create Basin Management Database

Under general direction and guidance from the MPWMD team, the Watermaster database will be formatted and generated to complement the features of the MPWMD's existing water resources database.

I. 2. a. 4. Populate Database with Data From All Sources

Under general direction and guidance from the MPWMD team, the Watermaster database will be populated with the existing data from all available sources, including the MPWMD's existing database, and all applicable data from Watermaster pumper entities, as well as other data available from miscellaneous sources.

I. 2. a. 5. Conduct Ongoing Data Entry/Database Maintenance

Under general direction and guidance from the MPWMD team, all newly- acquired data will be added to the Watermaster database as it becomes available, and any appropriate database structure modifications will be made as needed.

I. 2. b. Data Exchange and Collection

Incorporate ongoing groundwater monitoring data into the consolidated groundwater resource database. This will include the following subtasks:

I. 2. b. 1. Establish Agreements and Schedule

The MPWMD and RBF teams will closely coordinate to establish agreements and schedules for ensuring that all materials for Watermaster database development and ongoing maintenance are provided in an organized and timely manner for use by the Watermaster.

I. 2. b. 2. Establish Data Types, Formats

The MPWMD and RBF teams will closely coordinate to establish mutually acceptable data types and formats, which will provide the optimal benefit to the Watermaster for its recordkeeping and reporting purposes.

I. 2. c. Develop Data Archiving Procedures

Identify procedures for archiving collected field and electronic data.

I. 2. d. Develop Data QA/QC Procedures

Identify procedures for routine Quality Assurance/Quality Control of data collection program.

I. 2. e. Enhanced Monitoring Well Network Evaluation

Evaluate existing inactive production wells for possible inclusion with the existing and new monitoring well network. This will include the following subtasks:

I. 2. e.1 Key Laguna Seca Subbasin Locations

No work shall be performed under this Task.

I. 2.e.2 Key Southern Coastal Sub basin Locations

No work shall be performed under this Task.

I. 2. e.3 Summary Technical Memorandum with Recommendations

No work shall be performed under this Task.

I. 2. f. Laguna Seca Water Quality Investigation

As an additional component to the enhanced monitor well network evaluation, all available historical groundwater quality data sources in and near the Laguna Seca Sub area will be located by the MPWMD team, in order to evaluate and provide recommendations on enhancement of water quality monitoring that will facilitate future updated groundwater resources assessment of the Laguna Seca Sub area. No work shall be performed under this Task.

I. 3

Basin Management

I. 3. a. Supplemental Water Supplies

Brief review of supplemental water supplies will be conducted as warranted throughout the initial phase of the program. The effort devoted to this task is anticipated to increase once the consolidated database is developed and existing data is analyzed.

I. 4 Seawater Intrusion Contingency Plan/Establish Seawater Intrusion Baseline

Thorough, systematic, and appropriate analyses of groundwater data will allow us to identify, track, and mitigate seawater intrusion in the Basin. Seawater intrusion is a slow process, which can be impacted by ground water pumping that impacts ground water levels, and, in turn, affects ground water quality general mineral concentrations. Analyses that help identify seawater intrusion include: graphs of ground water levels, pumping and water quality trends; and maps representing these data using differentiated symbology. The final step is to evaluate the relationship that the pumping and water levels have on water quality.

••*Time series of chloride concentrations.* Chloride concentrations are the most dependable and recognizable indicator of seawater intrusion. Time series graphs from a single well can show steady increases in chloride concentrations that indicate seawater intrusion.

••*Time series of ionic ratios.* Typically, the molar ratio of sodium to chloride will often drop to near or below 0.85 in front of an advancing seawater wedge. Similarly, the molar ratio of calcium to sodium will rise in front of an advancing seawater wedge. These trends are due to the ionic exchange of sodium and calcium.

••*Trilinear plots.* Plotting major anions and cations on trilinear plots can show if water quality data from a single well is migrating towards seawater quality. Water quality plotted on does not migrate along a simple mixing line on trilinear plots if intrusion is due to an advancing seawater front. Data from Salinas Valley, however, suggests that water quality often does plot along a simple mixing line if intrusion is due to flow through abandoned or non-operating wells. This can help identify the intrusion mechanism in various places.

••*Time series of Stiff diagrams.* Plotting major anions and cations on stiff diagrams allows qualitative indication of seawater intrusion. Stiff diagrams are identified by their general shapes, each water type having a unique shape. A change in the shape of stiff diagrams may indicate seawater intrusion.

••*Time series of Chloride concentration maps.* Maps of chloride concentrations show the movement of a seawater intrusion front into a basin. Individual maps must be produced for each aquifer. Of importance is that all maps be developed with a consistent approach, ensuring that changes in the maps represent changes in data, not changes in contouring algorithms. The data will be presented in a Geographic Information System (GIS).

For purposes of the Seawater Intrusion Contingency Program, until additional empirical data are developed and analyzed, the Seaside groundwater basin aquifers will be defined as seawater intruded when the chloride concentration in a coastal monitor well reaches approximately 100 mg/l and 250 mg/l for the Paso Robles and Santa Margarita aquifers, respectively. For a coastal production well, the standard will be 250 mg/l, given that some wells contain multiple aquifer formations that reflects a blend of these sources. These standards will be utilized until more comprehensive standards based on historical water quality data at individual monitor and production wells can be developed. The Watermaster will institute interim standards for notice of potential seawater intrusion so that appropriate preventive actions may be taken. Interim notice will be defined as 50 percent increase above ambient chloride concentrations for any specific monitoring well location.

In addition to establishing baseline chloride concentrations and monitoring chloride concentrations, other complimentary water quality parameters will be established and monitored to provide supplemental data for water quality trend analysis and characterization. Appropriate water quality parameters, data formats and data transfer procedures will need to be identified and coordinated.

I. 4. a. Oversight of Seawater Intrusion Detection and Tracking

MCWRA will provide general oversight over the Seawater Intrusion detection program. No work shall be performed under this Task.

I. 4. b. Develop Seawater Intrusion Analysis Protocol

The RBF team will coordinate with MCWRA to adapt the existing seawater intrusion analysis protocol utilized in the Salinas Valley Groundwater Basin for use in the Seaside Groundwater Basin.

I. 4. c. Prepare Baseline Water Level Contour Mapping

Under general direction and guidance from MCWRA, up-to-date baseline water level contour mapping will be prepared utilizing all available water level data from existing production and monitor wells, and proposed new dedicated coastal sentinel monitor wells.

I. 4. d. Prepare Mapped Representation of Baseline Basin Pumping

Under general direction and guidance from MCWRA, mapped representation of recent (i.e., baseline) groundwater production will be prepared utilizing symbology adapted from the Salinas Valley Groundwater Basin.

I. 4. e. Graph and Map Historical Data/Establish Baseline Water Quality

Analyzing historical water quality data serves two purposes: 1) It establishes baseline water quality; and 2) It identifies historical water quality trends. By relying on wells that are completed over short lengths, and in discrete aquifers to determine background water quality for various aquifers. Wells completed over many aquifers may show a hybrid water quality signature. Use multiple approaches to identify water quality trends. Produce chloride time series graphs, ionic ratio time series graphs, stiff diagrams, trilinear plots (with standard seawater identified), and chloride contour maps for the time periods identified in Task 5.2. Arcview GIS 3.3 will be utilized to generate chloride contour maps per the procedures outlined in the RFP. A preliminary analysis of the graphs and maps will be conducted to establish baseline water quality and identify trends. In particular, compare water quality trends with water levels, pumping data, and recharge data to interpret both the aerial and vertical distribution of seawater intrusion. The graphs, maps, and analyses will be submitted for review by the entire Watermaster Board. Modifications to these graphs and maps will be incorporated based on input from Board members.

I. 4. f. Analyze and Map Water Quality from Coastal Monitoring Wells

Immediately after the coastal monitoring wells are installed and sampled, update data analyses with the data from these wells. New chloride concentration maps will be produced incorporating the data from the coastal wells. Because these new maps are the first maps with all data points included, they will serve as the baseline for future comparison. Water quality data from the new coastal wells precludes developing time series graphs during Phase 1, however the water quality data will be compared to water quality from similar, nearby wells to identify potential seawater intrusion until new data becomes available from the Phase 1 Coastal Sentinel Well Work Plan.

I. 4. g. Annual Report - Seawater Intrusion Analysis

At the end of each water year, all water quality data will be re-analyzed. Semi-annual chloride concentration maps will be produced for each aquifer in the basin. Time series graphs, trilinear graphs, and stiff diagram comparisons will be updated with new data. The annual EM logs will be analyzed to identify changes in seawater wedge locations. All analyses will be incorporated into an annual report that follows the format of the initial, historical data report. Potential seawater intrusion will be highlighted in the report, and if necessary, recommendations will be included. The annual report will be submitted for review to the Technical Advisory Committee (TAC) and then to the entire Watermaster Board. Modifications to the report will be incorporated based on input, first from the TAC, then from Board members.

After the first annual report, analysis and reporting can be transferred to Watermaster Board or be extended, depending on the needs of the Watermaster Board.

AMENDED EXHIBIT B

Seaside Basin Monitoring and Management Program

PHASE 1 BUDGET SUMMARY

Item	RBF Consulting
Labor Costs	
M.1 Program Administration	\$62,900
I.1 Monitor Well Construction	\$12,471
I.2 Production, Water Level and quality Monitoring	\$122,000
I.3 Basin Management	\$6,300
I.4 Seawater Intrusion Contingency Plan	\$88,800
Direct Costs	
Reproduction, Mileage, Miscellaneous (RBF)	\$15,000
Durbin Model Documentation (RBF)	\$40,000
TOTAL	\$347,471

**AMENDED EXHIBIT C
WORK SCHEDULE**

ID	Task Name	2007											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	CRITICAL PROJECT MILESTONES ASSOCIATED WITH TAC AND/OR CONSULTANT WORK												
2	2008 Administration, Operations and Replenishment Budgets Due												◆ 1/15
3	Watermaster Levy Standard Replenishment Assessment for 2007											◆ 11/15	
4	Watermaster Levy Standard Replenishment Assessment for 2008												
5	Watermaster Submits Monitor Well Site Report to Judge												◆ Completed
6	Watermaster Submits 2007 Annual Report to Judge											◆ 11/15	
7	Watermaster Submits 2008 Annual Report to Judge												
8	MANAGEMENT												
9	M.1 PROGRAM ADMINISTRATION												
10	IMPLEMENTATION												
11	I.1 CONSTRUCTION MONITORING WELLS (SENTINEL WELLS)												
12	Permitting												
13	State Parks ROE Permit												
14	CEQA Notice of Exemption												
15	Coastal Commission Approval												
16	MoCo Env Health-Well Construction Permit												
17	Construction												
18	Procure/ Mobilize Sentinel Monitor Well Contractor												
19	Sentinel Monitor Well Construction												
20	Sentinel Monitoring Well Development												
21	Initial Data Collection from New Sentinel Well												
22	Prepare Summary of Work Report and Submit to Watermaster												
23	Resolve ASR Monitoring Well Permitting/Approval Issues												
24	ASR MW Construction (by CWP)												

ID	Task Name	2007											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
25	I.2 COMPREHENSIVE BASIN PRODUCTION, WATER LEVEL, AND WATER QUALITY MONITORING PROGRAM												
26	I.2.a Basin Management Database Development												
27	I.2.a.1 Review of MPWMD Database												
28	I.2.a.2 Develop Scope of Work to Enhance or Develop New Groundwater Resource												
29	I.2.a.3 Create Basin Management Database												
30	I.2.a.4 Populate Database with Data From All Sources												
31	I.2.a.5 Conduct Ongoing Data Entry/Databas e Maintenance												
32	I.2.b Data Exchange and Collection												
33	I.2.c Develop Data Archiving Procedures												
34	I.2.d Develop Data QA/QC Procedures												
35	I.2.e Enhanced Monitoring Well Network Evaluation												
36	Submit Summary Technical Memo with Recommendations to TPM												
37	Present Summary Technical Memo with Recommendations to TAC												
38	I.2.f Laguna Seca Water Quality Investigation												
39	I.3 BASIN MANAGEMENT												
40	I.3.a Supplemental Water Supplies												
41	Submit Summary Technical Memo with Recommendations to TPM												
42	Present Summary Technical Memo with Recommendations to TAC												
43	Durbin Model Documentation												
44	Draft Documentation Report from Tim Durbin Received by RBF												
45	Submit Summary Technical Memo with Recommendations to TPM												
46	Present Summary Technical Memo with Recommendations to TAC												

ID	Task Name	2007											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
47	I.4 SEAWATER INTRUSION CONTINGENCY PLAN/ESTABLISH SEAWATER INTRUSION BASELINE												
48	I.4.a Oversight of Seawater Intrusion Detection and Tracking												
49	I.4.b Develop Seawater Intrusion Analysis Protocol												
50	I.4.c Prepare Baseline Water Level Contour Mapping												
51	I.4.d Prepare Mapped Representation of Baseline Basin Pumping												
52	I.4.e Graph & Map Historical Data/ Establish Baseline Water Quality												
53	I.4.f Analyze and Map Water Quality from Coastal Monitoring Wells												
54	I.4.g Annual Report - Seawater Intrusion Analysis												
55	Submit Draft Seawater Intrusion Analysis Report to TPM												
56	Present Draft Seawater Intrusion Analysis Report to TAC												
57	Present Draft Seawater Intrusion Analysis Report to Board												
58	Submit Final Seawater Intrusion Contingency Plan Report to TPM												