SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: 4/3/2014

RFS NO. 2014-03
(To be filled in by WATERMASTER)

TO: Derrik Williams
HydroMetrics WRI
PROFESSIONAL

FROM: Robert Jaques
WATERMASTER

Services Needed and Purpose: Update the Watermaster's Seaside Basin groundwater model and check its accuracy. Only perform recalibration if necessary and if directed to do so by Watermaster. See Scope of Work in Attachment 1.

Completion Date: All work of this RFS shall be completed not later than September 1, 2014, and shall be performed in accordance with the time schedule described in Attachment 1.

Method of Compensation: Time and Materials (As defined in Section V of Agreement.)

Total Price Authorized by this RFS: $ 33,875.00 (Cost is authorized only when evidenced by signature below.) (See Attachment 3 for Detailed Breakdown of Estimated Costs).

Total Price may not be exceeded without prior written authorization by WATERMASTER in accordance with Section V. COMPENSATION.

Requested by: _____ Date: 4/3/14.
WATERMASTER Technical Program Manager

Authorized by: _____ Date: 4/3/14
WATERMASTER Chief Executive Officer

Agreed to by: Derrik Williams Date: June 16, 2014
PROFESSIONAL

ATTACHMENT 1

SCOPE OF WORK

The Watermaster's existing Seaside Basin Groundwater Model (the Model), described in the report titled "Groundwater Flow and Transport Model" dated October 1, 2007, was updated in 2009 in order to develop protective water levels, and to evaluate replenishment scenarios and develop answers to Basin management questions. Under this RFS No. 2014-03 the accuracy of the Model will be updated by incorporating recent pumping data, groundwater level data, rainfall data, and other data into the Model. The Model output will then be checked to see if the simulated groundwater levels match the measured groundwater levels. If they match well, no further work will be needed. If the simulated and measured groundwater levels are found to differ significantly, some Model recalibration will be needed.

The scope of work is described in detail in the attached Exhibit "A" and will consist of providing professional consulting services to WATERMASTER for the following three Tasks:

Task 1: Update the Watermaster's Seaside Basin groundwater model and check its accuracy.

Task 2: Recalibrate the model. This Task will only be performed if recalibration is found to be necessary under Task 1. No work on this Task is to be performed unless and until written authorization to perform work is provided by WATERMASTER to PROFESSIONAL. WATERMASTER will notify PROFESSIONAL of its decision whether or not to proceed with work on Task 2 within six weeks of the date of receipt by WATERMASTER of the letter referred to in Subtask 1.3 of Exhibit "A."

Task 3: Prepare a report describing the work that was done under Task 2. This Task will only be performed if recalibration is performed under Task 2, and if so requested by WATERMASTER. No work on this Task is to be performed unless and until written authorization to perform work is provided by WATERMASTER to PROFESSIONAL. WATERMASTER will notify PROFESSIONAL of its decision whether or not to proceed with work on Task 3 at the same time it provides notification regarding the performance of work on Task 2.

The work is to be performed in accordance with the schedule described in Exhibit "A".

Compensation for the work will be in accordance with the detailed cost breakdown in the "Cost Estimate for Seaside Groundwater Basin Watermaster Groundwater Flow Model Update" in Exhibit "A".

Exhibit "A"

519 17th Street, Suite 500
Oakland, CA 94612

Mr. Robert S. Jaques, Technical Program Manager
Seaside Basin Watermaster
83 Via Encanto
Monterey, CA 93940

January 29, 2014

Subject: Scope and Cost Estimate to Update the Seaside Basin Groundwater Flow Model

Dear Mr. Jaques:

HydroMetrics Water Resources Inc. is pleased to submit this scope and cost estimate for updating the Seaside groundwater flow model. This update is needed to incorporate all available data up through 2013 into the model. The sections below outline the main tasks to be taken.

Task 1. Update Groundwater Model through 2013

SUBTASK 1.1 COLLECT AND COMPILE DATA

Data that needs to be collected for the model update includes groundwater pumping, groundwater levels, injected water volumes, and precipitation. In addition to the precipitation, estimates of storm water percolation, septic tank leakage, and system losses are also needed as they all contribute to the recharge of the basin.

Groundwater levels and production data will be requested from Monterey Peninsula Water Management District (MPWMD). Other pumpers, such as Cal Water Service and Marina Coast Water District, which do not fall under the Watermaster will be approached separately. Groundwater production for the

golf courses outside the Seaside basin will be estimated based on assumptions made previously.

SUBTASK 1.2 INPUT NEW DATA TO GROUNDWATER MODEL

The data compiled in Subtask 1.1 will be incorporated into the groundwater flow model.

SUBTASK 1.3 COMPARE MEASURED AND SIMULATED GROUNDWATER LEVELS

Once the model has been updated and is successfully running, hydrographs comparing measured and simulated groundwater levels will be prepared. The hydrographs produced will be the same ones used in the 2009 model report.

If there is a good match, further tasks will not be required. HydroMetrics WRI, however, will prepare a formal letter to the Watermaster's Technical Program Manager indicating whether or not calibration is necessary. If the measured and simulated groundwater levels do not match well for the updated period, the model will require recalibration and Task 2 will need to be authorized by the Watermaster.

Task 2. Model Recalibration

If the comparison of groundwater levels between measured and simulated from Subtask 1.3 indicates that there is a difference in groundwater levels in key wells, the model will require recalibration. This process involves varying relatively uncertain and sensitive parameters such as horizontal and vertical hydraulic conductivities, over a reasonable range of values. Calibration will be completed when simulated results match the measured data within an acceptable measure of accuracy, and when successive calibration attempts do not notably improve the calibration statistics.

This task includes time for one meeting in person to report to the TAC the outcome of the recalibration.

Task 3. Reporting

If Task 2 is authorized by the Watermaster, Task 3 may also be authorized. This task includes the preparation of a calibration report to document the calibration procedure and results.

The estimated cost for the work discussed is $33,875, as shown on the attached table.

It is expected that Task 1 will take approximately six weeks provided the requested data from water agencies is received within a week of its request. Task 2 and 3 can also be completed within six weeks after Task 1 has been completed.

Sincerely,

Derrik Williams

Derrik Williams, President
HydroMetrics Water Resources Inc.

Georgina King, Project Manager
HydroMetrics Water Resources Inc.

Cost Estimate for Seaside Groundwater Basin Watermaster
Groundwater Flow Model Update

Tasks	HydroMetrics WRI Labor					Other Direct Costs	TOTALS
	Derrik Williams	Georgina King	Stephen Hundt	Labor Total			
	President	Senior Hydrogeologist	Staff Hydrogeologist				
Rates	$215	$185	$115	Hours	($)	($)	($)
Task 1. Update Groundwater Model							
1.1 Collect and Compile Data	1	24	40	65	$ 9,255	$ -	$ 9,255
1.2 Input New Data to Groundwater Model	1	0	16	17	$ 2,055	$ -	$ 2,055
1.3 Compare Measured and Simulated Groundwater Levels	1	2	8	11	$ 1,505	$ -	$ 1,505
Subtotal Task 1				*93*	*$ 12,815*	*$ -*	*$ 12,815*
Task 2. Model Recalibration							
If required, Recalibrate Model	32	24	40	96	$ 15,920	$ 150	$ 16,070
Subtotal Task 2				*96*	*$ 15,920*	*$ 150*	*$ 16,070*
Task 3. Reporting							
If Task 2 is approved, prepare Report documenting recalibration (Provide as MS Word and PDF)	2	6	30	38	$ 4,990	$ -	$ 4,990
Subtotal Task 3				*38*	*$ 4,990*	*$ -*	*$ 4,990*
TOTAL				*227*	*$ 33,725*	*$ 150*	*$ 33,875*

Notes

Other Direct Costs includes mileage, postage, office supplies

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