

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: December 4, 2014

RFS NO. 2014-01

(To be filled in by WATERMASTER)

TO: Gus Yates
Todd Groundwater
PROFESSIONAL

FROM: Robert Jaques
WATERMASTER

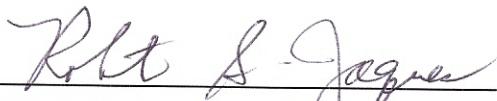
Services Needed and Purpose: Perform a peer review of hydrogeologic modeling and other related work performed by HydroMetrics WRI. See detailed Scope of Work in Attachment 1.


Completion Date: If notice-to-proceed is issued by WATERMASTER to PROFESSIONAL by December 1, 2014, all work of this RFS shall be completed not later than March 31, 2015, and shall be performed in accordance with the Schedule contained in Attachment 1. If notice-to-proceed is issued later than December 1, 2014, a commensurate later completion date will be specified.

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

Total Price Authorized by this RFS: \$ 25,420.00 (Cost is authorized only when evidenced by signature below.) (See Attachment 1 for Estimated Costs).

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

Requested by:  Date: 12/4/14
WATERMASTER Technical Program Manager

Authorized by:  Date: 12/17/14
WATERMASTER Chief Executive Officer

Agreed to by:  Date: 12/12/14
PROFESSIONAL

ATTACHMENT 1

SCOPE OF WORK AND ESTIMATED COSTS

Background

At its October 1, 2014 meeting the Watermaster Board directed staff to have a peer review performed on the Technical Memoranda that HydroMetrics WRI (HMWRI) has recently prepared for the Watermaster consisting of (1) updating the Basin model and checking its accuracy of predicted vs. measured ground water levels, and (2) evaluating various issues pertaining to the Laguna Seca Subarea of the Basin.

Both of these Technical Memos from HMWRI are posted on the Watermaster's website which is: <http://www.seasidebasinwatermaster.org/sbwmARC.html>. The two Technical Memos are the July 30 and July 31, 2014 postings in the "Reports" column of the "Postings and Records" tab of the website. The Laguna Seca memo is marked "Draft" since the Board wanted to have the peer review done to determine if any changes should be made to the Memorandum before it is finalized.

Due to the size of these Technical Memoranda they are not attached to this RFS No. 2014-01, but are incorporated herein by this reference thereto as background documents that PROFESSIONAL has reviewed in order to prepare the "Peer Review of Laguna Seca Analysis and Seaside Basin Groundwater Modeling" that is contained in Exhibit "A."

Scope of Work

The Scope of Work of this RFS No. 2014-01 will include an investigation of two areas where recent model results could directly affect basin management decisions: groundwater outflow from the Laguna Seca subarea to the El Toro subarea, and apparent errors in simulated water levels in the Northern Coastal subbasin. It will involve reviewing reports and memoranda, meetings with HMWRI personnel, sensitivity testing of the Groundwater Model, and preparing a Peer Review Memorandum. The peer review is expected to shed additional light on trans-boundary pumping effects in the Laguna Seca subarea and uncertainty in simulation results in the northern Coastal Subbasin, both of which are issues important to current water management decisions.

Based on past experience with peer reviews and PROFESSIONAL's initial review of HMWRI technical memoranda, it is anticipated that additional information from the simulation results will need to be extracted and that a small number of model sensitivity tests will need to be implemented. The most efficient way to accomplish that is with the assistance of HMWRI. Accordingly, the tasks include actions for PROFESSIONAL and for HMWRI. HMWRI has reviewed the task list contained in Exhibit "A" and provided a cost estimate for their part of the work, which is attached along with PROFESSIONAL's cost estimate for its part of the work.

The Scope of Work is described in detail in Exhibit "A."

Estimated Costs

The estimated costs for PROFESSIONAL to complete the peer review as described in Exhibit "A" is \$25,420.00. A breakdown of these costs is also contained in Exhibit "A." The total cost authorized by this RFS No. 2014-01 is \$25,420.00.

EXHIBIT "A"



October 30, 2014

MEMORANDUM

To: Bob Jaques, Seaside Basin Watermaster

From: Gus Yates, PG, CHG and Iris Priestaf, PhD, Todd Groundwater

Re: Peer review of Laguna Seca Analysis and Seaside Basin groundwater Modeling

The following tasks describe the approach we recommend for completing a technical peer review of recent studies by HydroMetrics Water Resources, Inc. (HMWRI) related to yield in the Laguna Seca subarea of the Seaside Basin and updated groundwater modeling of the entire basin. The review will be more than purely academic. It will include an investigation of two areas where recent model results could directly affect basin management decisions: groundwater outflow from the Laguna Seca subarea to the El Toro subarea, and apparent errors in simulated water levels in the Northern Coastal subbasin.

Based on past experience with peer reviews and a brief preliminary review of HMWRI technical memoranda, we anticipate wanting to extract additional information from the simulation results and implement a small number of model sensitivity tests. The most efficient way to accomplish that is with the assistance of HMWRI. Accordingly, the tasks include actions for me and for HMWRI. HMWRI provided a cost estimate based on a preliminary description of potential modeling work that we provided. For your information, their cost estimate is attached along with the cost estimate for our review work.

Gus Yates will serve as the primary peer reviewer. He has previously completed studies of groundwater in the Seaside Basin, including a groundwater model of the Laguna Seca Subarea. Furthermore, he has completed peer reviews of groundwater technical studies in four other basins during the past year, for which he efficiently and impartially identified strengths, uncertainty and limitations of modeling studies.

SCOPE OF WORK

Task 1. Review Reports and Memoranda

Mr. Yates will carefully review the July 2014 Model Update Report and the August 2014 Laguna Seca Yield Analysis, referring to the original 2009 Groundwater Modeling Report as needed. He will compile a list of questions regarding model assumptions, algorithms and output related to: 1) the effects of external pumping on water levels and yield in the Laguna Seca Subarea and 2) discrepancies between measured and simulated water levels in the

northern coastal subarea during the 2008-2013 model update period. He will also prepare a list of additional model output from recent simulations that would help address the questions. For example, this might include contours of simulated groundwater levels in the Laguna Seca-El Toro area and water balances for subareas within that region. He will submit the questions and information request in an informal written communication to HMWRI.

Task 2. First Meeting with HydroMetrics WRI

HMWRI will compile information and prepare responses to the questions raised by Mr. Yates. HMWRI and Mr. Yates will meet to discuss the information and explore any concerns related to accuracy or bias in model output or conclusions drawn from modeling results. The discussion might identify additional tests of the model that would present a clearer picture of its strengths and weaknesses. For example, this might include sensitivity of simulation errors in the northern coastal subarea to assumptions or parameters related to the ocean boundary, vertical leakance between model layers, and storativity.

Task 3. Sensitivity Testing of Groundwater Model

HMWRI will complete additional tests of the model as agreed upon at the first meeting and transmit a summary of the results to Mr. Yates in an informal e-mail. Mr. Yates will review those results in preparation for the second meeting.

Task 4. Second Meeting with Hydrometrics WRI

Mr. Yates and HMWRI staff will meet again to discuss the results of the model sensitivity tests as well as the overall strengths and weaknesses of the model and the associated degree of confidence in water resources management recommendations that are based on model output.

Task 5. Prepare Peer Review Memorandum

Mr. Yates will summarize his findings and the results of the meetings and model tests in a draft memorandum to the Watermaster. He will attend a meeting of the TAC and/or Board in Seaside to present and discuss the draft report and receive comments. If the Watermaster, technical advisory committee or Board members have verbal or written questions or comments, Mr. Yates will address those in a final version of the peer review memorandum. Any questions or comments that require additional modeling might need to be supported by a budget augmentation for HMWRI.

SCHEDULE

Following a notice to proceed, the anticipated schedule to complete the tasks is as follows:

Task 1 3 weeks

Task 2 2 weeks

| | |
|----------------------|-----------------------------------|
| Task 3 | 4 weeks |
| Task 4 | 2 weeks |
| Task 5 (draft) | 2 weeks |
| Task 5 (final) | 2 weeks after receipt of comments |
| Total | 15 weeks |

COST

The estimated cost for Todd Groundwater to complete the peer review is \$13,110. HMWRI estimates that their cost to support the peer review will be a maximum of \$12,310. If fewer sensitivity tests are needed, the cost would be lower. The total combined cost is \$25,420. Details of the cost estimates by person and task are attached.

Cost Estimate for Peer Review of Laguna Seca and Seaside Basin Groundwater Modeling Studies
Todd Groundwater

| | Iris Priestaf | | Gus Yates | | Drafting /GIS | Admin | Total Hours | Total Labor Costs | Expenses | Total Labor and Expenses |
|--|---------------|-----------|--------------------|--|---------------|----------|-------------|-------------------|--------------|--------------------------|
| | Principal | | Senior Hydrologist | | | | | | | |
| | \$205 | \$185 | | | | | | | | |
| Task 1. Review Reports and Memoranda | 1 | 16 | | | | 1 | 18 | \$3,255 | \$0 | \$3,255 |
| Task 2. First Meeting with HydroMetrics WRI | | 4 | | | | | 4 | \$740 | \$0 | \$740 |
| Task 3. Sensitivity Testing of Groundwater Model | | 6 | | | | | 6 | \$1,110 | \$0 | \$1,110 |
| Task 4. Second Meeting with HydroMetrics WRI | | 4 | | | | | 4 | \$740 | \$0 | \$740 |
| Task 5. Prepare Peer Review Memorandum | 3 | 28 | | | 4 | 1 | 36 | \$6,285 | \$100 | \$6,385 |
| Total | 4 | 58 | | | 4 | 2 | 68 | \$12,130 | \$980 | \$13,110 |

Todd submits invoices monthly on a time and materials basis; we regard this estimate as a not-to-exceed budget.

30-Oct-14

Cost Estimate for HydroMetrics WRI Support of Todd Groundwater Peer Review

| Tasks | HydroMetrics WRI Labor | | | | | | TOTALS |
|--|------------------------|-----------------------|------------------|------------------|-------------|-----------|-----------|
| | Derrick Williams | Georgina King | Stephen | Haleemah | Labor Total | | |
| | President | Senior Hydrogeologist | Hydrogeologist 3 | Hydrogeologist 1 | Hours | (\$) | |
| | Rates | | | | | | (\$) |
| Task 2. First Meeting with Todd Groundwater | \$215 | \$185 | \$125 | \$100 | 4 | \$ 860 | \$ 860 |
| Task 3. Run Model, Export Output, and Analyze Model Output | 4 | 0 | 0 | 0 | 4 | \$ 860 | \$ 860 |
| Task 4. Second Meeting with Todd Groundwater | 8 | 4 | 30 | 8 | 50 | \$ 7,010 | \$ 7,010 |
| Task 5. Respond to Additional Questions from TAC/Board | 4 | 0 | 0 | 0 | 4 | \$ 860 | \$ 860 |
| TOTAL | 8 | 6 | 6 | 0 | 20 | \$ 3,580 | \$ 3,580 |
| | 24 | 10 | 36 | 8 | 78 | \$ 12,310 | \$ 12,310 |