

**AMENDMENT NO. 2  
TO STANDARD AGREEMENT  
BETWEEN COUNTY OF MONTEREY AND  
ERROL L. MONTGOMERY & ASSOCIATES, INC.**

**THIS AMENDMENT NO. 2** to Standard Agreement No. A-14638 between the County of Monterey, a political subdivision of the State of California (hereinafter, “County”), and Errol L. Montgomery & Associates (hereinafter, “CONTRACTOR”) is hereby entered into between the County and the CONTRACTOR (collectively, the County and CONTRACTOR are referred to as the “Parties”) as of the last date opposite the respective signatures.

**WHEREAS**, CONTRACTOR entered into Standard Agreement A-14638 with County on March 4, 2020, (hereinafter, “Agreement”) to provide professional hydrogeologic services for completing the Salinas Valley Groundwater Basin Investigation (SVGBI) with a term of April 1, 2020 through June 30, 2021 and for a total Agreement amount not to exceed \$233,260; and

**WHEREAS**, this Agreement was amended by the Parties on April 19, 2021 (hereinafter, “Amendment No. 1”) to extend the term for one additional year through June 30, 2022 and with no change to the total Agreement amount of \$233,260; and

**WHEREAS**, an update to the scope of services to include additional modeling work, as set forth in Exhibit A-1, attached hereto and incorporated herein by reference, is required for the completion of the SVGBI; and

**WHEREAS**, additional time and funding are necessary to allow CONTRACTOR to complete the SVGBI with the updated scope; and

**WHEREAS**, the full cost of expanding the Sea Water Intrusion Model (SWI) to incorporate the Zone 2C coastal area will be \$243,404 to be split equally between the County of Monterey and the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA), so County is responsible for only half of this additional cost; and

**WHEREAS**, Exhibit A-1 lists the Monterey County Water Resources Agency (MCWRA) as sharing the cost with SVBGSA, but this portion of the cost will be borne by County, not MCWRA, because MCWRA’s role is to provide project management for the County; and

**WHEREAS**, to enable completion of services with the updated scope of work, the Parties wish to amend the Agreement, as previously amended by Amendment No. 1, to extend the term for an additional six months through December 31, 2022 for a revised full Agreement term of April 1, 2020 through December 31, 2022 and to increase the Agreement amount by \$121,702 for a total Agreement amount not to exceed \$354,962.

**NOW, THEREFORE**, the Parties agree to amend the Agreement, as previously amended by Amendment No. 1, as follows:

Amendment No. 2 to Standard Agreement  
Errol L. Montgomery & Associates, Inc.  
Housing and Community Development (HCD)  
Term: April 1, 2020 to December 31, 2022  
Not to Exceed: \$354,962.00

1. Amend the first sentence under Section 1.0 titled "GENERAL DESCRIPTION" to read as follows:

The County hereby engages CONTRACTOR to perform, and CONTRACTOR hereby agrees to perform, the services described in **Exhibit A** and **Exhibit A-1** in conformity with the terms of this Agreement.

2. Amend the paragraph under Section 2.0 titled "PAYMENT PROVISIONS" to read as follows:

County shall pay the CONTRACTOR in accordance with the payment provisions set forth in Exhibit A and Exhibit A-1, subject to the limitations set forth in this Agreement. The total amount payable by County to CONTRACTOR under this Agreement shall not exceed the sum of \$354,962.

3. Amend the first sentence of Section 3.0 titled "TERM OF AGREEMENT" to read as follows:

The term of this Agreement is from April 1, 2020 through December 31, 2022, unless sooner terminated pursuant to the terms of this Agreement.

4. Amend Section 4.0 titled "SCOPE OF SERVICES AND ADDITIONAL PROVISIONS/EXHIBITS" to read as follows:

The following attached exhibits are incorporated herein by reference and constitute a part of this Agreement:

Exhibit A: Scope of Services/Payment Provisions

Exhibit A-1: Scope of Services/Payment Provisions, as per Amendment No. 2

Exhibit B Other: Revision to third paragraph of 9.04, other Requirements, and section 10.1, Confidentiality, of Agreement

5. Except as amended herein, all other terms and conditions of the Agreement and Amendment No. 1, including all Exhibits thereto, remain unchanged and in full force and effect.

6. This Amendment No. 2 shall be attached to the Agreement and incorporated therein as if fully set forth in the Agreement.

Amendment No. 2 to Standard Agreement  
Errol L. Montgomery & Associates, Inc.  
Housing and Community Development (HCD)  
Term: April 1, 2020 to December 31, 2022  
Not to Exceed: \$354,962.00

IN WITNESS WHEREOF, the Parties hereto have executed this Amendment No. 2 to the Agreement which shall be effective as of the last date opposite the respective signatures below.

**COUNTY OF MONTEREY**

By: \_\_\_\_\_  
Contracts/Purchasing Officer

Date: \_\_\_\_\_

**Approved as to Form  
Office of the County Counsel  
Leslie J. Girard, County Counsel**

By: \_\_\_\_\_  
DocuSigned by:  
*Wendy Strimling*  
Wendy S. Strimling  
Assistant County Counsel

Date: 11/24/2021 | 9:47 AM PST

**Approved as to Fiscal Provisions**

By: \_\_\_\_\_  
DocuSigned by:  
*Gary Giboney*  
Gary Giboney  
Auditor

Date: 11/24/2021 | 10:12 AM PST

**Approved as to Indemnity and Insurance Provisions  
Office of the County Counsel**

By: \_\_\_\_\_  
Danielle P. Mancuso  
Risk Manager

Date: \_\_\_\_\_

**CONTRACTOR\***

Errol L. Montgomery & Associates, Inc.  
Contractor's Business Name

By: \_\_\_\_\_  
*Hale Barter*  
(Signature of Chair, President or Vice President)

Its: Hale Barter -President  
(Print Name and Title)

Date: 11/23/2021 | 10:18 AM PST

By: \_\_\_\_\_  
DocuSigned by:  
*Phyllis Leach*  
Sr. Corp. Administrator/  
Treasurer  
(Signature of Secretary, Asst. Secretary, CFO, Treasurer or Asst. Treasurer)

Its: Phyllis Leach  
(Print Name and Title)

Date: 11/23/2021 | 1:20 PM EST

\*INSTRUCTIONS: If CONTRACTOR is a corporation, including non-profit corporations, the full legal name of the corporation shall be set forth above together with the signatures of two (2) specified officers per California Corporations Code Section 313. If CONTRACTOR is a Limited Liability Corporation (LLC), the full legal name of the LLC shall be set forth above together with the signatures of two (2) managers. If CONTRACTOR is a partnership, the full legal name of the partnership shall be set forth above together with the signature of a partner who has authority to execute this Agreement on behalf of the partnership. If CONTRACTOR is contracting in an individual capacity, the individual shall set forth the name of the business, if any, and shall personally sign the Agreement or Amendment to said Agreement.

Amendment No. 2 to Standard Agreement  
Errol L. Montgomery & Associates, Inc.  
Housing and Community Development (HCD)  
Term: April 1, 2020 to December 31, 2022  
Not to Exceed: \$354,962.00

**EXHIBIT A-1 - Scope of Services/Payment Provisions, as per Amendment No. 2**

UPDATE TO TASK 4:

EXPANSION OF THE SEAWATER INTRUSION MODEL



**MONTGOMERY  
& ASSOCIATES**

Water Resource Consultants



Groundwater experts since 1984

October 6, 2021

Mr. Les Girard  
County of Monterey  
168 W. Alisal Street, 3<sup>rd</sup> Floor  
Salinas, CA 93901

**SUBJECT: SUBTASKS TO TASK 4 OF THE BASIN INVESTIGATION FOR EXPANSION OF THE SEAWATER INTRUSION MODEL**

Dear Mr. Girard:

At the request of MCWRA and SVBGSA, Montgomery & Associates (M&A) has prepared this Scope of Work (SOW) and cost estimate for expanding the seawater intrusion (SWI) Model that M&A is currently developing for the Monterey Subbasin for SVBGSA through a grant from the Department of Water Resources. The expanded SWI Model will incorporate the length of the SVBGSA coastal area of the Salinas Valley Groundwater Basin and Zone 2C, so as to also meet the requirements of the Settlement Agreement between the Salinas Valley Water Coalition and Monterey County. This will be added as Subtasks to Task 4 of the Original Agreement for the Basin Investigation (Executed SA 030420).

This present work is focused on converting the Marina Coast Water District's (MCWD) Marina Monterey Subbasin Model (a MODFLOW-NWT model) into a variable density flow model (a USG-TRANSPORT model). This Model focuses on the Monterey Subbasin and has a northern boundary of the Salinas River. The proposed SOW is to expand the model area to encompass the full extent of potential SWI, using data from all existing available models (MCWD's Marina Monterey Subbasin Model, SVIHM/SVOM, North Marina Groundwater Model, and the Seaside Basin Model). This will enable seawater intrusion to be modeled for the entire region, not limited by political boundaries.

In addition, the expansion into the 180/400-Foot Aquifer Subbasin, for which there is airborne electromagnetic (AEM) data, opens up the possibility of using AEM data to calibrate the model and produce a model with reduced uncertainty. Developing a more accurate model will improve assessments of the potential for specific projects to address seawater intrusion, such as a seawater extraction barrier or recharge projects. The expanded SWI Model could be run in conjunction with the SVIHM/SVOM to estimate the benefits of a project throughout the Salinas Valley.



Expanding the SWI Model will have a number of benefits:

- Rapidly complete an activity MCWRA planned as part of the ongoing Basin Investigation. Planned modeling activities in the Basin Investigation included adding seawater intrusion capabilities to the SVIHM/SVOM models. Expanding the Monterey Subbasin SWI Model provides a more accurate and effective tool for simulating seawater intrusion, on a more rapid schedule.
- Provide for modeling of regional projects: The Marina Monterey Subbasin Model only encompasses a small portion of the area currently impacted by SWI. Building an expanded model would enable the simulation of SWI along the entire coastal portion of Zone 2C, and allow assessment of any proposed projects or actions on the entire seawater intruded area.
- Allow better incorporation of hydrologic boundaries: Because the Monterey Subbasin SWI Model is limited to the Monterey Subbasin boundary delineated by DWR, its model extent primarily does not follow known hydrologic boundaries. The expanded model will incorporate hydrologic boundaries which are scientifically more defensible.
- Enable use of geophysical AEM data to reduce uncertainty and more accurately model potential project benefits: Recent work from Stanford's Dr. Rosemary Knight using geophysics to map SWI provides a promising option for improving SWI model calibration. The area of SWI in the Monterey Subbasin is largely excluded from this work due to inability to collect AEM data over urban areas. However, there is extensive AEM data already collected for the 180/400-Foot Aquifer Subbasin. Expanding the Model allows for the incorporation of the geophysics into the modeling. Including the geophysics in the SWI modeling would reduce the uncertainty in the Model and enable better model predictions.

## **OBJECTIVES**

The primary objective of this proposed work is to develop an expanded SWI model covering the Zone 2C and SVBGSA coastal area of the Salinas Valley Basin. This model will be a tool for agencies and stakeholders to use in assessing SWI along the coast including potential benefits of SWI mitigation options. Development of this model includes the following tasks, in addition to the tasks described in the original Monterey Subbasin SWI Model scope of work:

- Sub-task 1. Model development in the expanded area
- Task 2. Model calibration in the expanded area



- Subtask 3. Predictive modeling in the expanded area
- Subtask 4. Deliverables

Each of these tasks are further discussed below as they relate to expanding M&A's current scope with SVBGSA. These tasks leverage the existing work to develop the Monterey Subbasin SWI Model, and the tasks and costs summarized herein only reflect the additional costs of the model expansion.

## **PROJECT TASKS**

### **Subask 1. Model Development**

This task involves the construction of a variable density flow model across the Zone 2C coastal area. The existing model extent will be expanded to the north, beyond the Monterey Subbasin boundary, to incorporate all of Zone 2C coast. The model will also be expanded to the west some distance into Monterey Bay to incorporate offshore groundwater-seawater interactions. The expansion will incorporate the area currently impacted by SWI and areas to the east near the City of Salinas.

Model boundaries will be selected based upon M&A's understanding of natural hydrologic boundaries in the area. If natural boundaries are located at such a distance away from the SWI area as to render the model excessively large, then model boundaries will be selected such that their influence on simulating SWI will be limited (i.e., the boundaries will be far enough away such that boundary effects are not evident in the modeling).

### **Subask 2. Model Calibration**

Once the model is constructed, it will be calibrated to observed conditions. Calibration is the process of adjusting model parameters such that historical simulations reasonably represent historical conditions. Although not always the case, a well calibrated model (good history match) can provide reasonable predictions of future scenarios and mitigation efforts. Generally, a better calibrated model provides better predictions.

History matching (i.e., calibration) would entail developing historical datasets (i.e., calibration datasets) of varying data types such as:

- Water levels
- SWI concentration (i.e., chloride concentration)
- Surface water flows



- Aquifer testing data
- Geophysical data

Of particular note is the geophysical data that can be used in the model calibration. Chloride sampling data can provide some information regarding the extent of SWI but is limited to the well location and its screen elevation. Geophysics, however, can map areas of SWI within the various aquifers of the area providing information where sampling data doesn't exist. Incorporating geophysical data into the calibration (termed hydrogeophysical inversion) will greatly improve the model's ability to simulate SWI. M&A will work with Dr. Knight and her group at Stanford to incorporate their geophysical mapping of Salinas Valley SWI into the calibration. The geophysical data include AEM surveys over the past several years (2017, 2019, and 2021). The hydrogeophysical inversion will be a joint effort between M&A and Dr. Knight.

### **Subtask 3. Predictive Modeling**

Using the calibrated model developed in Subtask 2, several predictive scenarios would be run. The first simulation would be a Base-case scenario that projects only the current conditions into the future. Subsequent scenarios would incorporate various SWI mitigation options or other potential hydrologic changes. Each predictive scenario would be compared to the base-case scenario to assess benefits/impacts. This SOW assumes that up to 4 predictive scenarios would be developed and simulated (including the base-case scenario). The predictive scenarios will be developed jointly with SVBGSA and MCWRA.

Selection of scenarios may leverage the AEM data incorporated into the calibration in Subtask 2. These AEM data show the general distribution of SWI and can inform managers of areas where mitigation is necessary. Oftentimes SWI conditions in these areas are not adequately captured by a groundwater sampling network.

### **Subtask 4 Deliverables**

Subtask 4 includes regular conference calls with SVBGSA and MCWRA to provide updates on the modeling progress and the development of a report documenting the model. It is anticipated that the report would have the following sections:

- Executive Summary
- Introduction
- Conceptual Model
- Numerical Model
- Calibration





- Predictive Simulations
- Conclusions and Recommendations
- References

A draft report will be submitted to SVBGSA and MCWRA for one round of comments. M&A will incorporate comments into the report and then submit a final report.

## **ASSUMPTIONS**

This proposal assumes the following regarding the availability of relevant data and models are:

- Operational baseline versions of existing models are available to use in developing the model. These models are the SVIHM/SVOM, Marina Monterey Subbasin Model, North Marina Groundwater Model, and the Seaside Basin Model. M&A already has the provisional SVIHM/SVOM models and the Marina Monterey Subbasin Model. Permission from the Seaside Watermaster has been granted to use the Seaside Basin Model. We are presently securing the North Marina Groundwater Model.
- Groundwater extraction / injection data are available for model incorporation.
- Water level data, chloride concentration data, and surface water flow data are available for model calibration.
- Geophysical data and a geophysical inversion model are available for use in the calibration.

## **SCHEDULE**

The proposed project schedule is shown in Attachment B.

## **PROFESSIONAL FEES**

Expanding the SWI model to incorporate the Zone 2C coastal area would incur an additional estimated cost of \$121,700 for MCWRA (rounded). This will be added as an Exhibit to the Original M&A Agreement for the Basin Investigation (Executed SA 030420), and will be listed as Subtasks of Task 4. SVBGSA will fund the other \$121,700 (rounded). If the actual scope of work varies from the described scope of work, actual costs will vary from estimated costs. However, the estimated additional cost of \$121,700 for MCWRA would not be exceeded without prior authorization.



The table below summarizes the costs associated with each task. A detailed cost breakdown table is provided as Attachment A.

<b>Description</b>	<b>Hours</b>	<b>Total Cost</b>	<b>SVBGSA</b>	<b>MCWRA</b>
Model Development	310	\$46,446	\$0	\$46,446
Model Calibration	400	\$75,300	\$54,014	\$21,286
Predictive Modeling	252	\$37,676	\$37,676	\$0
Deliverables	449	\$83,982	\$30,012	\$53,970
Overhead		\$0		
<b>Total</b>	<b>1411</b>	<b>\$243,404</b>	<b>\$121,702</b>	<b>\$121,702</b>

Based on the direction M&A received from SVBGSA and MCWRA, M&A is moving forward as if this expansion will be funded so as to be as efficient as possible. Expanding the model during model development requires significantly less time than doing so after the Monterey Subbasin SWI Model is completed.

Sincerely,  
MONTGOMERY & ASSOCIATES

A handwritten signature in black ink that reads "Derrik Williams".

Derrik Williams, P.G., C.Hg.  
Principal Hydrogeologist

Attachment A: Detailed Cost

Attachment B. Schedule

ATTACHMENT A. ESTIMATED COSTS FOR MONTGOMERY & ASSOCIATES PROFESSIONAL SERVICES - SUBTASKS TO TASK 4									
Seawater Intrusion Model Expansion Along Salinas Basin Coastal Area									
		Estimated Hours					Estimated Fees & Expenses		
		Scientist VII	Scientist VI	Scientist V	Geophysics	Scientist II	Total Hours	Total M&A Professional Fees	Total M&A Fees and Expenses
M&A staff		Williams	Schorr	Nelson	Stanford	Hermosilla, Cañez, Pontifex, Reeves			
2021 Professional Billing Rates		\$265	\$220	\$198	\$198	\$133			
<b>Subtask 1</b>	<b>Model Development</b>								
	Model Domain Extent	2	2	16		64	84	\$ 12,650	\$ 12,650
	Model Layering and Zonation	2	2	24		96	124	\$ 18,490	\$ 18,490
	Model Development	2	8	8		40	58	\$ 9,194	\$ 9,194
	Model Construction Review			4		40	44	\$ 6,112	\$ 6,112
	<b>Subtotal:</b>	<b>6</b>	<b>12</b>	<b>52</b>	<b>0</b>	<b>240</b>	<b>310</b>	<b>\$ 46,446</b>	<b>\$ 46,446</b>
<b>Subtask 2</b>	<b>Model Calibration</b>								
	Calibration Data Compilation							\$ -	\$ -
	Setup Model Calibration							\$ -	\$ -
	Setup Hydrogeophysical Inversion			72	160		232	\$ 45,936	\$ 45,936
	Model Calibration			20	48	20	88	\$ 16,124	\$ 16,124
	Model Calibration Review				40	40	80	\$ 13,240	\$ 13,240
	<b>Subtotal:</b>	<b>0</b>	<b>0</b>	<b>92</b>	<b>248</b>	<b>60</b>	<b>400</b>	<b>\$ 75,300</b>	<b>\$ 75,300</b>
<b>Subtask 3</b>	<b>Predictive Modeling</b>								
	Base-case Scenario			4	8	56	68	\$ 9,824	\$ 9,824
	Scenario 1			4	8	40	52	\$ 7,696	\$ 7,696
	Scenario 2			4	8	40	52	\$ 7,696	\$ 7,696
	Scenario 3			4	8	40	52	\$ 7,696	\$ 7,696
	Predictive Modeling Review			8	8	12	28	\$ 4,764	\$ 4,764
	<b>Subtotal:</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>40</b>	<b>188</b>	<b>252</b>	<b>\$ 37,676</b>	<b>\$ 37,676</b>
<b>Subtask 4</b>	<b>Deliverables/Program Management</b>								
	Program Management		8				8	\$ 1,760	\$ 1,760
	Update Conference Calls	10	10	20	10	4	54	\$ 11,322	\$ 11,322
	Draft Report	12	12	120	80	80	304	\$ 56,060	\$ 56,060
	Final Report	4	4	24	21	30	83	\$ 14,840	\$ 14,840
	<b>Subtotal:</b>	<b>26</b>	<b>34</b>	<b>164</b>	<b>111</b>	<b>114</b>	<b>449</b>	<b>\$ 83,982</b>	<b>\$ 83,982</b>
	<b>TOTAL:</b>	<b>32</b>	<b>46</b>	<b>332</b>	<b>399</b>	<b>602</b>	<b>1411</b>	<b>\$ 243,404</b>	<b>\$ 243,404</b>

Attachment B. SCHEDULE - SUBTASKS TO TASK 4

	8/9/2021	8/16/2021	8/23/2021	8/30/2021	9/6/2021	9/13/2021	9/20/2021	9/27/2021	10/4/2021	10/11/2021	10/18/2021	10/25/2021	11/1/2021	11/8/2021	11/15/2021	11/22/2021	11/29/2021	12/6/2021	12/13/2021	12/20/2021	12/27/2021	1/3/2022	1/10/2022	1/17/2022	1/24/2022	1/31/2022	2/7/2022	2/14/2022	2/21/2022	2/28/2022	3/7/2022	3/14/2022	3/21/2022	3/28/2022	4/4/2022	4/11/2022	4/18/2022	4/25/2022	5/2/2022	5/9/2022	5/16/2022	5/23/2022	5/30/2022	6/6/2022	6/13/2022	6/20/2022	6/27/2022	7/4/2022	7/11/2022	7/18/2022	7/25/2022	
	Month 1				Month 2				Month 3				Month 4				Month 5				Month 6				Month 7				Month 8				Month 9				Month 10				Month 11				Month 12							
Weeks From Start	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
<b>Subtask 1. Model Development</b>	[Green bar]																																																			
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