AGREEMENT FOR PROFESSIONAL SERVICES

between

THE COUNTY OF MONTEREY

and

BROWN AND CALDWELL

This Professional Services Agreement ("Agreement") is made by and between the County of Monterey, a political subdivision of the State of California (hereinafter "COUNTY") and Brown and Caldwell, a professional corporation (hereinafter "CONTRACTOR").

In consideration of the mutual covenants and conditions set forth in this Agreement, the parties agree as follows:

1. SERVICES TO BE PROVIDED. The COUNTY hereby engages CONTRACTOR to perform, and CONTRACTOR hereby agrees to perform, the services described in **Exhibit A** in conformity with the terms of this Agreement. The services are generally described as follows: Perform the Salinas Valley Groundwater Basin Zone 2C study ("Study") required by Policy PS-3.1 of the 2010 Monterey County General Plan.

2. PAYMENTS BY COUNTY.

2.01. COUNTY shall pay the CONTRACTOR in accordance with the payment provisions set forth in **Exhibit A**, subject to the limitations set forth in this Agreement. It is anticipated that the total cost for services provided pursuant to the Agreement shall be an amount not to exceed $773,873.

2.02. Where CONTRACTOR has provided COUNTY with a breakdown of the total compensation into subtasks, such breakdowns are estimates only. CONTRACTOR may re-allocate compensation between tasks, provided total compensation is not exceeded without approval of the COUNTY.

3. TERM OF AGREEMENT. This Agreement is effective from the date last signed by the parties and shall be effective through the completion of the Study, unless sooner terminated pursuant to the terms of this Agreement. This Agreement is of no force or effect until signed by both CONTRACTOR and COUNTY and with COUNTY signing last, and CONTRACTOR may not commence work before COUNTY signs this Agreement.

4. ADDITIONAL PROVISIONS/EXHIBITS. The following attached exhibits are incorporated herein by reference and constitute a part of this Agreement:

Exhibit A Scope of Services/Payment Provisions

5. PERFORMANCE STANDARDS.

5.01. CONTRACTOR warrants that CONTRACTOR and CONTRACTOR's agents, employees, and subcontractors performing services under this Agreement are specially trained, experienced,

competent, and appropriately licensed to perform the work and deliver the services required under this Agreement and are not employees of the COUNTY, or immediate family of an employee of the COUNTY.

5.02. Standard of Care – Professional Services. Subject to the express provisions of the agreed scope of work as to the degree of care, amount of time and expenses to be incurred, and subject to any other limitations contained in this Agreement, CONTRACTOR shall perform its Services in accordance with generally accepted standards and practices customarily utilized by competent engineering firms in effect at the time CONTRACTOR's Services are rendered. CONTRACTOR does not expressly or impliedly warrant or guarantee its Services.

5.03. CONTRACTOR shall furnish, at its own expense, all materials, equipment, and personnel necessary to carry out the terms of this Agreement, except as otherwise specified in this Agreement. CONTRACTOR shall not use COUNTY premises, property (including equipment, instruments, or supplies) or personnel for any purpose other than in the performance of its obligations under this Agreement.

5.04. Reliance upon Information Provided by Others. If CONTRACTOR'S performance of services hereunder requires CONTRACTOR to rely on information provided by other parties (excepting CONTRACTOR'S subcontractors), CONTRACTOR shall not independently verify the validity, completeness, or accuracy of such information unless otherwise expressly engaged to do so in writing by COUNTY.

5.05. CONTRACTOR'S Opinion of Costs. COUNTY acknowledges that construction cost estimates, financial analyses and feasibility projections are subject to many influences including, but not limited to, price of labor and materials, unknown or latent conditions of existing equipment or structures, and time or quality of performance by third parties. COUNTY acknowledges that such influences may not be precisely forecasted and are beyond the control of CONTRACTOR and that actual costs incurred may vary substantially from the estimates prepared by CONTRACTOR. CONTRACTOR does not warrant or guarantee the accuracy of construction or development cost estimates.

6. PAYMENT CONDITIONS.

6.01. CONTRACTOR shall submit to the Contract Administrator an invoice on a form acceptable to COUNTY. If not otherwise specified, the CONTRACTOR may submit such invoice periodically or at the completion of services, but in any event, not later than 30 days after completion of services. The invoice shall set forth the amounts claimed by CONTRACTOR for the previous period, together with an itemized basis for the amounts claimed, and such other information pertinent to the invoice as the COUNTY may require. The Contract Administrator or his or her designee shall certify the invoice; either in the requested amount or in such other amount as the COUNTY approves in conformity with this Agreement, and shall promptly submit such invoice to the County Auditor-Controller for payment. The County Auditor-Controller shall pay the amount certified within 30 days of receiving the certified invoice.

6.02. CONTRACTOR shall not receive reimbursement for travel expenses unless set forth in this Agreement.

7. TERMINATION.

7.01. During the term of this Agreement, the COUNTY may terminate the Agreement for any reason by giving written notice of termination to the CONTRACTOR at least thirty (30) days prior to the effective date of termination. Such notice shall set forth the effective date of termination. In the event of such termination, the amount payable under this Agreement shall be reduced in proportion to the services provided prior to the date of termination.

7.02. The COUNTY may cancel and terminate this Agreement for good cause effective immediately upon written notice to CONTRACTOR. "Good cause" includes the failure of CONTRACTOR to perform the required services at the time and in the manner provided under this Agreement. If COUNTY terminates this Agreement for good cause, the COUNTY may be relieved of the payment of any consideration to CONTRACTOR, and the COUNTY may proceed with the work in any manner, which COUNTY deems proper. The cost to the COUNTY shall be deducted from any sum due the CONTRACTOR under this Agreement.

8. INDEMNIFICATION.

8.01. For purposes of the following indemnification provisions ("Indemnification Agreement"), "design professional" has the same meaning as set forth in California Civil Code section 2782.8. If any term, provision or application of this Indemnification Agreement is found to be invalid, in violation of public policy or unenforceable to any extent, such finding shall not invalidate any other term or provision of this Indemnification Agreement and such other terms and provisions shall continue in full force and effect. If there is any conflict between the terms, provisions or application of this Indemnification Agreement and the provisions of California Civil Code Sections 2782 or 2782.8, the broadest indemnity protection for the COUNTY under this Indemnity Agreement that is permitted by law shall be provided by CONTRACTOR.

8.02. Indemnification for Design Professional Services Claims: CONTRACTOR shall indemnify, defend and hold harmless COUNTY, its governing board, directors, officers, employees, and agents against any claims that arise out of, or pertain to, or relate to the negligence, recklessness, or willful misconduct of the CONTRACTOR, its employees, subcontractors, and agents in the performance of design professional services under this Agreement, excepting only liability arising from the negligence, active negligence or willful misconduct of the COUNTY, or defect in a design furnished by the COUNTY.

8.03. Indemnification for All Other Claims or Loss: For any claim, loss, injury, damage, expense or liability other than claims arising out of the CONTRACTOR'S performance of design professional services under this Agreement, CONTRACTOR shall indemnify, defend and hold harmless COUNTY, its governing board, directors, officers, employees, and agents against any claim for loss, injury, damage, expense or liability resulting from or alleging injury to or death of any person or loss of use of or damage to property, arising from or related to the negligent performance of services under this Agreement by CONTRACTOR, its employees, subcontractors or agents, excepting only liability arising from the negligence, active negligence or willful misconduct of the COUNTY, or defect in a design furnished by the COUNTY.

8.04. Notwithstanding any other term of this Agreement, in no event shall either party be responsible or liable to the other for any incidental, consequential, or indirect damages.

9. INSURANCE.

9.01 Evidence of Coverage: Prior to commencement of this Agreement, the Contractor shall provide a "Certificate of Insurance" certifying that coverage as required herein has been obtained. Individual endorsements executed by the insurance carrier shall accompany the certificate.

This verification of coverage shall be sent to the County's, Contracts/Purchasing Department, unless otherwise directed. The Contractor shall not receive a "Notice to Proceed" with the work under this Agreement until it has obtained all insurance required and such, insurance has been approved by the COUNTY. This approval of insurance shall neither relieve nor decrease the liability of the CONTRACTOR.

9.02 Qualifying Insurers: All coverage's, except surety, shall be issued by companies which hold a current policy holder's alphabetic and financial size category rating of not less than A- VII, according to the current Best's Key Rating Guide or a company of equal financial stability that is approved by the County's Purchasing Manager.

9.03 Insurance Coverage Requirements: Without limiting CONTRACTOR's duty to indemnify, CONTRACTOR shall maintain in effect throughout the term of this Agreement a policy or policies of insurance with the following minimum limits of liability:

Commercial general liability insurance, including but not limited to premises and operations, including coverage for Bodily Injury and Property Damage, Personal Injury, Contractual Liability, Broadform Property Damage, Independent Contractors, Products and Completed Operations, with a combined single limit for Bodily Injury and Property Damage of not less than $1,000,000 per occurrence.

❑ Modification (Justification attached; subject to approval).

Business automobile liability insurance, covering all motor vehicles, including owned, leased, non-owned, and hired vehicles, used in providing services under this Agreement, with a combined single limit for Bodily Injury and Property Damage of not less than $1,000,000 per accident.

❑ Modification (Justification attached; subject to approval).

Workers' Compensation Insurance, if CONTRACTOR employs others in the performance of this Agreement, in accordance with California Labor Code section 3700 and with Employer's Liability limits not less than $1,000,000 each person, $1,000,000 each accident and $1,000,000 each disease.

❑ Modification (Justification attached; subject to approval).

Professional liability insurance, if required for the professional services being provided, (e.g., those persons authorized by a license to engage in a business or profession regulated by the California Business and Professions Code), in the amount of not less than $1,000,000 per claim and $2,000,000 in the aggregate, to cover liability for malpractice or errors or omissions made in the course of rendering professional services. If professional liability insurance is written on a "claims-made" basis rather than an occurrence basis, the CONTRACTOR shall, upon the expiration or earlier termination of this Agreement, obtain extended reporting coverage ("tail coverage") with the same liability limits. Any such tail coverage shall continue for at least three years following the expiration or earlier termination of this Agreement.

❑ Modification (Justification attached; subject to approval).

9.04. Other Insurance Requirements.

All insurance required by this Agreement shall be with a company acceptable to the COUNTY and issued and executed by an admitted insurer authorized to transact Insurance business in the State of California. Unless otherwise specified by this Agreement, all such insurance shall be written on an occurrence basis, or, if the policy is not written on an occurrence basis, such policy with the coverage required herein shall continue in effect for a period of three years following the date CONTRACTOR completes its performance of services under this Agreement.

Each liability policy shall provide that the COUNTY shall be given notice in writing at least thirty days in advance of any endorsed reduction in coverage or limit, cancellation, or intended non-renewal thereof. Each policy shall provide coverage for CONTRACTOR and additional insureds with respect to claims arising from each subcontractor, if any, performing work under this Agreement, or be accompanied by a certificate of

insurance from each subcontractor showing each subcontractor has identical insurance coverage to the above requirements.

Commercial general liability and automobile liability policies shall provide an endorsement naming the COUNTY, its officers, agents, and employees as Additional Insureds with respect to liability arising out of the CONTRACTOR'S work, including ongoing and completed operations, and shall further provide that such insurance is primary insurance to any insurance or self-insurance maintained by the COUNTY and that the insurance of the Additional Insureds shall not be called upon to contribute to a loss covered by the CONTRACTOR'S insurance. The required endorsement form for Commercial General Liability Additional Insured is ***ISO Form CG 20 10 11-85 or CG 20 10 07/04 in tandem with CG 20 37 07/04 or equivalent****. The required endorsement form for Automobile Additional Insured endorsement is* ***ISO Form CA 20 48 02 99****.*

Prior to the execution of this Agreement by the COUNTY, CONTRACTOR shall file certificates of insurance with the County's contract administrator and County's Contracts/Purchasing Division, showing that the CONTRACTOR has in effect the insurance required by this Agreement. The CONTRACTOR shall file a new or amended certificate of insurance within five calendar days after any change is made in any insurance policy, which would alter the information on the certificate then on file. Acceptance or approval of insurance shall in no way modify or change the indemnification clause in this Agreement, which shall continue in full force and effect.

CONTRACTOR shall at all times during the term of this Agreement maintain in force the insurance coverage required under this Agreement and shall send, without demand by COUNTY, annual certificates to County's Contract Administrator and County's Contracts/Purchasing Division. If the certificate is not received by the expiration date, COUNTY shall notify CONTRACTOR and CONTRACTOR shall have five calendar days to send in the certificate, evidencing no lapse in coverage during the interim. Failure by CONTRACTOR to maintain such insurance is a default of this Agreement, which entitles COUNTY, at its sole discretion, to terminate this Agreement immediately.

10. RECORDS AND CONFIDENTIALITY.

10.01. Confidentiality. CONTRACTOR and its officers, employees, agents, and subcontractors shall comply with any and all federal, state, and local laws, which provide for the confidentiality of records and other information. CONTRACTOR shall not disclose any confidential records or other confidential information received from the COUNTY or prepared in connection with the performance of this Agreement, unless COUNTY specifically permits CONTRACTOR to disclose such records or information. CONTRACTOR shall promptly transmit to COUNTY any and all requests for disclosure of any such confidential records or information. CONTRACTOR shall not use any confidential information gained by CONTRACTOR in the performance of this Agreement except for the sole purpose of carrying out CONTRACTOR's obligations under this Agreement.

Notwithstanding the foregoing, CONTRACTOR shall have no confidential obligation with respect to information that: a) becomes generally available to the public other than as a result of disclosure by CONTRACTOR or its agents or employees; b) was available to CONTRACTOR on a non-confidential basis prior to its disclosure by COUNTY; or c) become available to CONTRACTOR from a third party who is not, to the knowledge of CONTRACTOR, bound to retain such information in confidence.

In the event CONTRACTOR is compelled by subpoena, court order, or administrative order ("Order") to disclose any confidential information, Contractor shall promptly notify COUNTY and shall cooperate with COUNTY prior to disclosure so that COUNTY may take necessary actions to protect such confidential information from disclosure.

10.02. County Records. When this Agreement expires or terminates, CONTRACTOR shall return to COUNTY any COUNTY records which CONTRACTOR used or received from COUNTY to perform services under this Agreement.

10.03. Maintenance of Records. CONTRACTOR shall prepare, maintain, and preserve all reports and records that may be required by federal, state, and COUNTY rules and regulations related to services performed under this Agreement. CONTRACTOR shall maintain such records for a period of at least three years after receipt of final payment under this Agreement. If any litigation, claim, negotiation, audit exception, or other action relating to this Agreement is pending at the end of the three year period, then CONTRACTOR shall retain said records until such action is resolved.

10.04. Access to and Audit of Records. The COUNTY shall have the right to examine, monitor and audit all records, documents, conditions, and activities of the CONTRACTOR and its subcontractors related to services provided under this Agreement. Pursuant to Government Code section 8546.7, if this Agreement involves the expenditure of public funds in excess of $10,000, the parties to this Agreement may be subject, at the request of the COUNTY or as part of any audit of the COUNTY, to the examination and audit of the State Auditor pertaining to matters connected with the performance of this Agreement for a period of three years after final payment under the Agreement.

10.05. Royalties and Inventions. COUNTY shall have a royalty-free, exclusive and irrevocable license to reproduce, publish, and use, and authorize others to do so, all original computer programs, writings, sound recordings, pictorial reproductions, drawings, and other works of similar nature produced in the course of or under this Agreement. CONTRACTOR shall not publish any such material without the prior written approval of COUNTY.

10.06. Work Product. CONTRACTOR'S work product, which is prepared solely for the purposes of this Agreement, including, but not limited to, drawings, test results, recommendations and technical specifications, whether in hard copy or electronic form, shall become the property of COUNTY when CONTRACTOR has been fully compensated as set forth herein. CONTRACTOR may keep copies of all work product for its records.

CONTRACTOR and COUNTY recognize that CONTRACTOR's work product submitted in performance of this Agreement is intended only for the project covered by this Agreement. Alteration of CONTRACTOR's work product or its use by COUNTY for any other purpose shall be at COUNTY'S sole risk, and COUNTY shall hold harmless and indemnify CONTRACTOR against all losses, damages, costs and expense, including attorneys' fees, arising out of or related to any such alteration or unauthorized improper use.

10.07. Electronic Copies. If requested, solely as an aid and accommodation to COUNTY, CONTRACTOR may provide copies of its work product documents in computer-readable media ("electronic copies," "CADD"). These documents will duplicate the documents provided as work product, but will not bear the signature and professional seals of the registered professionals responsible for the work. COUNTY is cautioned that the accuracy of electronic copies and CADD documents may be compromised by electronic media degradation, errors in format translation, file corruption, printing errors and incompatibilities, operator inexperience and file modification. CONTRACTOR will maintain the original copy, which shall serve as the official, archived record of the electronic and CADD documents. COUNTY agrees to hold harmless, indemnify and defend CONTRACTOR from any claims arising out of or relating to any unauthorized change or alteration of electronic copies and CADD documents

11. NON-DISCRIMINATION. During the performance of this Agreement, CONTRACTOR, and its subcontractors, shall not unlawfully discriminate against any person because of race, religious creed, color, sex, national origin, ancestry, physical disability, mental disability, medical condition, marital status, age (over 40), or sexual orientation, either in CONTRACTOR's employment practices or in the furnishing of services to recipients. CONTRACTOR shall ensure that the evaluation and treatment of its employees and applicants for employment and all persons receiving and requesting services are free of such discrimination. CONTRACTOR and any subcontractor shall, in the performance of this Agreement, fully comply with all federal, state, and local laws and regulations, which prohibit discrimination. The provision of services primarily or exclusively to such target population as may be designated in this Agreement shall not be deemed to be prohibited discrimination.

12. COMPLIANCE WITH TERMS OF STATE OR FEDERAL GRANT. If this Agreement has been or will be funded with monies received by the COUNTY pursuant to a contract with the state or federal government in which the COUNTY is the grantee, CONTRACTOR will comply with all the provisions of said contract, to the extent applicable to CONTRACTOR as a subgrantee under said contract, and said provisions shall be deemed a part of this Agreement, as though fully set forth herein. Upon request, COUNTY will deliver a copy of said contract to CONTRACTOR, at no cost to CONTRACTOR.

13. INDEPENDENT CONTRACTOR. In the performance of work, duties, and obligations under this Agreement, CONTRACTOR is at all times acting and performing as an independent contractor and not as an employee of the COUNTY. No offer or obligation of permanent employment with the COUNTY or particular COUNTY department or agency is intended in any manner, and CONTRACTOR shall not become entitled by virtue of this Agreement to receive from COUNTY any form of employee benefits including but not limited to sick leave, vacation, retirement benefits, workers' compensation coverage, insurance or disability benefits. CONTRACTOR shall be solely liable for and obligated to pay directly all applicable taxes, including federal and state income taxes and social security, arising out of CONTRACTOR's performance of this Agreement. In connection therewith, CONTRACTOR shall defend, indemnify, and hold COUNTY harmless from any and all liability, which COUNTY may incur because of CONTRACTOR's failure to pay such taxes.

14. NOTICES. Notices required under this Agreement shall be delivered personally or by first-class, postage pre-paid mail to the COUNTY and CONTRACTOR'S contract administrators at the addresses listed below:

FOR COUNTY:	**FOR CONTRACTOR:**
Carl Holm Deputy RMA Director Name and Title	Leslie L. Chau Lead Investigator, Managing Geologist Name and Title
168 W. Alisal Street Salinas, CA 93901 Address	1390 Market Street, Suite 1025 San Francisco, CA 94102 Address
(831) 755-5103 Phone	(415) 552-5849 Phone

15. MISCELLANEOUS PROVISIONS.

15.01. Conflict of Interest. CONTRACTOR represents that it presently has no interest and agrees not to acquire any interest during the term of this Agreement, which would directly or indirectly conflict

in any manner or to any degree with the full and complete performance of the professional services required to be rendered under this Agreement.

15.02. Amendment. This Agreement may be amended or modified only by an instrument in writing signed by the COUNTY and the CONTRACTOR.

15.03. Waiver. Any waiver of any terms and conditions of this Agreement must be in writing and signed by the COUNTY and the CONTRACTOR. A waiver of any of the terms and conditions of this Agreement shall not be construed as a waiver of any other terms or conditions in this Agreement.

15.04. Contractor. The term "CONTRACTOR" as used in this Agreement includes CONTRACTOR's officers, agents, and employees acting on CONTRACTOR's behalf in the performance of this Agreement.

15.05. Disputes. CONTRACTOR shall continue to perform under this Agreement during any dispute.

15.06. Assignment and Subcontracting. The CONTRACTOR shall not assign, sell, or otherwise transfer its interest or obligations in this Agreement without the prior written consent of the COUNTY. None of the services covered by this Agreement shall be subcontracted without the prior written approval of the COUNTY. Notwithstanding any such subcontract, CONTRACTOR shall continue to be liable for the performance of all requirements of this Agreement.

15.07. Successors and Assigns. This Agreement and the rights, privileges, duties, and obligations of the COUNTY and CONTRACTOR under this Agreement, to the extent assignable or delegable, shall be binding upon and inure to the benefit of the parties and their respective successors, permitted assigns, and heirs.

15.08. Compliance with Applicable Law. The parties shall comply with all applicable federal, state, and local laws and regulations in performing this Agreement.

15.09. Headings. The headings are for convenience only and shall not be used to interpret the terms of this Agreement.

15.10. Time is of the Essence. Time is of the essence in each and all of the provisions of this Agreement.

15.11. Governing Law. This Agreement shall be governed by and interpreted under the laws of the State of California.

15.12. Non-exclusive Agreement. This Agreement is non-exclusive and both COUNTY and CONTRACTOR expressly reserve the right to contract with other entities for the same or similar services.

15.13. Construction of Agreement. The COUNTY and CONTRACTOR agree that each party has fully participated in the review and revision of this Agreement and that any rule of construction to the effect that ambiguities are to be resolved against the drafting party shall not apply in the interpretation of this Agreement or any amendment to this Agreement.

15.14. Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same Agreement.

15.15. Authority. Any individual executing this Agreement on behalf of the COUNTY or the CONTRACTOR represents and warrants hereby that he or she has the requisite authority to enter into this Agreement on behalf of such party and bind the party to the terms and conditions of this Agreement.

15.16. Integration. This Agreement, including the exhibits, represent the entire Agreement between the COUNTY and the CONTRACTOR with respect to the subject matter of this Agreement and shall supersede all prior negotiations, representations, or agreements, either written or oral, between the COUNTY and the CONTRACTOR as of the effective date of this Agreement, which is the date that the COUNTY signs the Agreement.

15.17. Interpretation of Conflicting Provisions. In the event of any conflict or inconsistency between the provisions of this Agreement and the Provisions of any exhibit or other attachment to this Agreement, the provisions of this Agreement shall prevail and control.

15.18. Force Majeure. CONTRACTOR shall not be responsible for delays caused by circumstances beyond its reasonable control, including, but not limited to (1) strikes, lockouts, work slowdowns or stoppages, or accidents, (2) acts of God, (3) failure of COUNTY to furnish timely information or to approve or disapprove CONTRACTOR'S instruments of service promptly, and (4) faulty performance or nonperformance by COUNTY, COUNTY'S independent contractors, or governmental agencies. CONTRACTOR shall not be liable for damages arising out of any such delay, nor shall the CONTRACTOR be deemed to be in breach of this Agreement as a result thereof.

15.19. No Benefit for Third Parties. The services and professional opinions to be provided by CONTRACTOR are based upon the specific scope of work authorized by County and, as such, are intended solely for the benefit and use of County. No benefit is intended to be conferred on, nor contractual relationship established with any person or entity not a party to this Agreement. No such person or entity shall be entitled to rely upon Contractor's services, opinions, recommendations, plans, or specifications provided hereunder. No right to assert a claim against the Contractor, its officers, employees, agents, or Contractors shall accrue to the construction contractor or to any subcontractor, supplier, manufacturer, lender, insurer, surety, or any other third party as a result of this Agreement or the performance or nonperformance of the Contractor's services hereunder.

15.20. Severability. If any part of this Agreement is found unenforceable under applicable laws, such part shall be inoperative, null, and void insofar as it conflicts with said laws, but the remainder of this Agreement shall be in full force and effect unless such provision is a material part of this Agreement without which either party would not receive the consideration bargained for in this Agreement.

15.21. Attorneys' Fees. In the event either party commences legal proceedings against the other, then the prevailing party shall, in addition to any other recovery, be entitled to recover its reasonable attorneys' fees and all other costs of such proceeding.

This space is left blank, intentionally.

IN WITNESS WHEREOF, COUNTY and CONTRACTOR have executed this Agreement as of the day and year written below.

DATED: _____ COUNTY OF MONTEREY

By_____
Benny Young
Director, Resource Management Agency

DATED: _____ BROWN AND CALDWELL

By_____
James W. Graydon, P.E. LEED AP
Vice President

APPROVED AS TO FORM AND LEGALITY

CHARLES J. MCKEE, County Counsel

By_____
Leslie J. Girard
Chief Assistant County Counsel

APPROVED AS TO FISCAL PROVISIONS

By_____
(Auditor/Controller)]

APPROVED AS TO LIABILITY PROVISIONS

By_____
(Risk Management)]

1390 Market Street, Suite 1025
San Francisco, CA 94102

Phone: 415-552-5849
Fax: 925-937-9026

EXHIBIT A

Brown AND Caldwell

May 28, 2014

Leslie J. Girard
Chief Assistant County Counsel
County of Monterey
168 W. Alisal Street, 3rd Floor
Salinas, CA 93901

071963-010

Subject: Proposal for Professional Hydrogeologic Services –Study of Zone 2C of the Salinas River Groundwater Basin

Dear Mr. Girard:

Brown and Caldwell (BC) is pleased to present our scope of work, estimated costs, and schedule to conduct a comprehensive water resources assessment of Zone 2C of the Salinas River Groundwater Basin. The proposed study consists of two projects developed as part of the Monterey County Board of Supervisors Referral (No. 2014.01) and the litigation settlement agreement M109451 (Settlement Agreement) between the Salinas Valley Water Coalition and the County of Monterey. It is our understanding that the proposed work to be performed by BC will be contracted with the County of Monterey Resource Management Agency with oversight provided by the Monterey County Water Resources Agency (MCWRA).

The scope of work developed for the two projects is based on our discussions with Mr. Howard Franklin Senior Hydrologist at the MCWRA, with the intent to address Policy PS-3.1 c.1), 2), 3), 4), 5), and 6) of Exhibit A in the Settlement Agreement. The two projects are as follows:

- Project 1 – Conduct a near term assessment of the health and status of Zone 2C of the Salinas River Groundwater Basin. The primary objective of this project is to evaluate if immediate steps are required to address current water supply conditions due to the continuing drought conditions in the Central Coast. Completion of this project by November 2014 is intended to address Monterey County Board of Supervisors Referral (No. 2014.01);
- Project 2 – Conduct a five-year study of Zone 2C of the Salinas River Groundwater Basin for the Board of Supervisors. This study is to be completed no earlier than October 31, 2018 and no later than March, 2019. The primary objectives of Project 2 are to assess the general health of Zone 2C of the Salinas River Groundwater Basin, with regards to its ability to provide a sustainable supply of water for land use as projected to the year 2030 outlined in Monterey County's 2010 amended General Plan. Completion of this project is also intended to address the requirements in the settlement Agreement with specific objectives listed in the amended 2010 General Plan for Policy PS-3.1 Long-Term Sustainable Water Supply.

EXHIBIT A

A summary of our proposed costs and schedule are broken down by tasks and presented in Tables 1 and 2. Detailed scopes of work are presented in Attachments A (Project 1) and B (Project 2). Assumptions used for development of the estimated costs presented in Table 1 are also included in these attachments. It is our understanding that all technical analyses will use existing and available data provided by the County and other publicly available information. BC will research available information that will benefit the independent analyses, conclusions, and recommendations in these two projects.

Table 1. Project 1 – Proposed Tasks, Budget, and Schedule

Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
Project Kickoff and Initial Data Review	Trend Analyses	Groundwater Usage	Groundwater Storage	State of the Basin Analysis & Report	Presentation to BOS	Project Management
$7,487	$6,843	$6,845	$25,527	$36,165	$8,392	$11,618
6/30/14	7/1/14	7/2/14	7/1/14	7/29/14	10/7/14	6/30/14
7/1/14	9/8/14	9/11/14	9/8/14	11/17/14	11/18/14	11/14/14

Table 2. Project 2 - Proposed Tasks, Budget, and Schedule

Task 1	Task 2	Task 3	Task 4	Task 5	Task 6
Continued Data Compilation	SVIGSM Model Review	Conceptual Model Development	Modeling Tools Assessment & Selection	Groundwater / Surface Water Model Development	Numerical Model Simulations
$15,384	$6,892	$75,525	$8,023	$98,645	$237,438
9/9/14	9/9/14	8/12/14	10/7/14	12/2/14	3/2/15
10/27/14	10/6/14	1/12/15	12/1/14	3/2/15	4/26/19
Task 7	**Task 8**	**Task 9**	**Task 10**	**Task 11**	
Stakeholder Meetings	Comprehensive Report – Basin Water Supply	Presentations to BOS	Technical Advisory Committee	Project Management	
$13,493	$84,159	$25,115	$31,312	$75,011	
1/13/15	11/12/18	2/3/16	9/23/14	11/19/14	
4/1/19	3/29/19	4/1/19	6/22/15	9/20/16	

EXHIBIT A

Proposed Fee and Schedule

Our estimated fee is $773,873 for the proposed scope of work to be completed on a time and material basis. Our fee schedule will be attached to the AGREEMENT FOR PROFESSIONAL SERVICES between the County of Monterey and Brown and Caldwell.

The detailed budget and schedule are broken down into subtasks for the two projects to assist your review and approval. A five percent (5%) markup will be applied to subconsultants. The detailed budget and schedule are presented in Attachment C and D, respectively.

I would be happy to discuss this proposal with you. Please call me if you have any questions.

Very truly yours,

Brown and Caldwell

Leslie L. Chau
Lead Investigator, Managing Geologist

Joseph B. Tuner
Chief Hydrogeologist P.G. 5125, C.H.G 454,

James W. Graydon, P.E. LEED AP
Vice President

LC:MK:ds

Attachments (4)

1. Attachment A: Scope of Work – Project 1
2. Attachment B: Scope of Work – Project 2
3. Attachment C: Detailed Budget
4. Attachment D: Detailed Schedule

Attachment A: Scope of Work – Project 1

Project 1 - Near term assessment of the groundwater basin's health and status

Background and Objectives

Board of Supervisor Chair Lou Calcagno submitted referral 2014.01 on 14 February 2014 to initiate the Salinas River Groundwater Basin Zone 2C study; required by "the amended" County General Plan Policy PS-3.1 and to commence a near term assessment of the health and status of the groundwater basin no later than 1 August 2014. The proposed Project 1 consists of conducting the near term evaluation to assess if immediate steps are appropriate to face current water supply conditions due to the continuing drought conditions in the Central Coast. The study is proposed to be completed by November 2014. The work will be managed by Resource Management Agency (RMA) with the assistance of the Water Resources Agency (MCWRA).

The specific objectives in Project 1 are:

- To assess the impact of current and possible continuing drought conditions on the state of water supply in the Salinas River Groundwater Basin, specifically of Zone 2C (Figure 1); and
- To evaluate if immediate steps are appropriate to face current water supply conditions.

Project Schedule

This short term study will commence immediately upon notification to proceed from the County. The analyses specified in the scope of work are estimated to require up to five (5) months to complete with the expectation that the project will be presented to the Board of Supervisors in early November 2014. The detailed schedule is presented in Attachment D.

Project Description

BC with the assistance of the MCWRA, will provide the resources and expertise to perform the technical aspects of this study. The detailed scope of work is presented herein.

Data evaluations, conclusions, and recommendations in the study will be based on assessments of current understandings, interpretations, and existing data provided by the MCWRA. The BC team made up of quantitative hydrologists and hydrogeologists will work with MCWRA hydrologists and water quality scientists to expedite mapping, data trend analyses, and peer reviews of interpretations and conclusions.

The quantitative analyses will primarily focus on short and long term trends of 1) groundwater extractions; 2) estimated aquifer storage; and 3) water quality trends of chloride; nitrate, and electrical conductivity separately for the seven subareas within the Salinas River Groundwater Basin Zone 2C (Figure 1). Conclusions from this analysis will focus on the immediate status of groundwater supply for the Salinas River Groundwater Basin Zone 2C (Study Area) comparing water demand (groundwater extractions) and current estimated aquifer storage. The recommendations will be based on conclusions drawn and include necessary short term mitigation measures of undesirable impacts to basin yield should the drought persist. Recommendations may include deepening of water wells, decrease pumping rates, and relocations of wells.

Project Location

Figure 1 shows the approximate extent of the Monterey County Water Resources Agency's Zone 2C

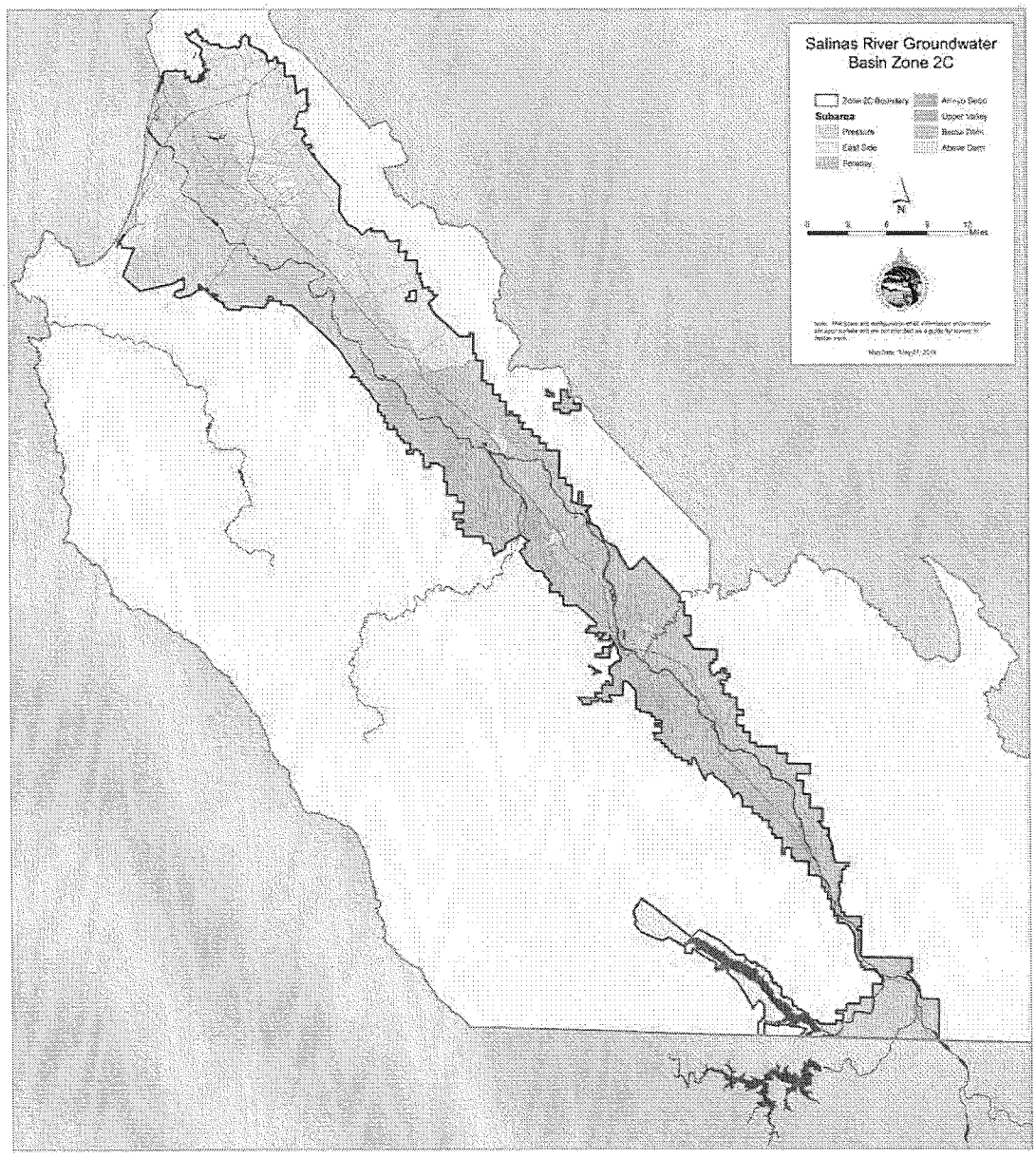


Figure 1. Zone 2C Hydrologic Boundary, County of Monterey

Project 1 will assess the current (2013) extent of seawater intrusion with designated aquifers of the basin as part of the assessment of groundwater quality. Figures 2 and 3 present historical maps outlining the extent of seawater intrusion for years up to 2011.

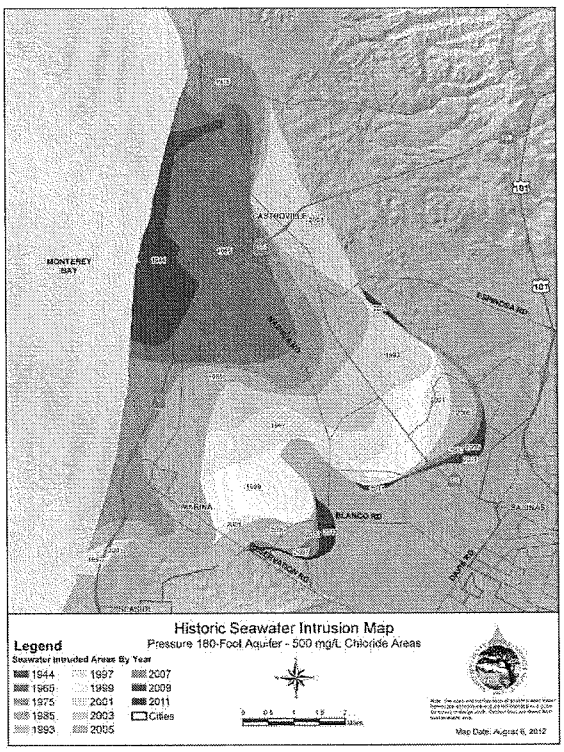


Figure 2. Pressure 180-Foot - Historical Seawater Intrusion

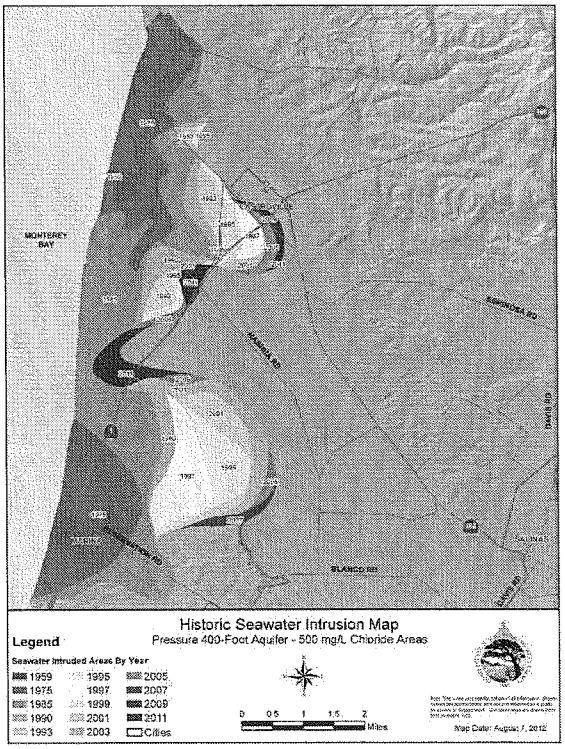


Figure 3. Pressure 400-Foot - Historical Seawater Intrusion

Scope of Work

The following scope of work is a multi-disciplinary approach to provide groundwater and hydrologic evaluations necessary to develop a near-term assessment of the groundwater basin's health and status. The intent is to complete various data evaluations to carefully describe the condition of the basin, draw conclusions, and give recommendations. The evaluations will be based on the latest data and interpretations provided by the MCWRA and working collaboratively with MCWRA staff. The analyses in this scope of work will use existing information provided by the County and do not require additional data collection or data creation.

Task 1. Project Kickoff and Initial Data Review

BC will meet with County and MCWRA staff in a project kickoff meeting to confirm: 1) project objectives and schedule; 2) technical approaches and methods; and, 3) bibliography and available data. BC will review available hydrology materials provided by the MCWRA. The BC team will prepare additional data requests if needed to MCWRA. An FTP site will be set up using MCWRA servers for project data exchanges.

It is anticipated that the data to be reviewed in this meeting will consist of groundwater and surface water data; groundwater and surface water quality data; trend analyses; electronic results of existing aquifer tests; geologic well logs; general chemistry data; results of existing infiltration testing; GIS

maps (including geologic maps) with metadata; land-use information; and, the 2010 General Plan EIR.

Deliverables:

1. One set of meeting notes for overall distribution; listing data bibliography, GIS maps with metadata, schedule adjustments, and scheduled regular project conference calls and on-site meetings.
2. Data request memo.

Assumptions:

- Meeting notes will be presented as final and no revisions will be required.
- BC will perform up to 80 hours in data compilation and data research on as-needed basis throughout the duration of this project.
- Data compilations will be assisted by MCWRA.
- County will provide available data within 20 calendar days of data request.

Task 2. Trend Analyses

The objective of the trend analyses is to prepare a set of hydrologic data for the analysis of changes in water supply and seawater intrusion characteristics based on historical trends and potential trends into the future. The groundwater data will be graphically documented along with precipitation data and other hydrologic information to analyze water demand versus groundwater supply by subarea.

BC will work with MCWRA hydrologists to determine the appropriate statistical parameters to be utilized as part of trend analysis. The parameters may include selected averaging methods, and data-trend-significance tests. This task will include classification of data into "ranked" above normal and normal to dry precipitation conditions to evaluate temporal trends.

Task 2A. Groundwater Elevation Trends (short / long terms)

BC will construct hydrographs and contour maps for groundwater elevation data collected by the MCWRA. Trend analysis will be developed from annual data. Contour maps will include August Trough and annual data for the Pressure-, Pressure, East Side, Forebay and Upper Valley Subareas. The hydrographs will incorporate available precipitation and evapotranspiration data.

Task 2B. Seawater Intrusion Trends (short / long term)

BC will construct historical chloride (Cl) concentrations related to seawater intrusion versus time plots, chemographs and maps. MCWRA will provide available water quality data for the Pressure and Eastside subareas. The intent is to prepare data that would be helpful in the evaluation (Task 5) of changes in the rate of seawater intrusion (spatial and temporal trends) based on the extrapolation of historical Cl trends.

Task 2C. Water Quality Trends

BC will construct chemographs and contour maps with available groundwater quality data provided by the MCWRA. The trend analyses will focus on nitrate as nitrate (NO_3) and total dissolved solids (TDS) primarily for the Forebay and Upper Valley subareas (Figure 1).

Deliverables:

1. Groundwater elevation hydrographs at selected data locations – up to 10 locations;

2. Groundwater elevation contour maps for each Subarea and valley wide (7 subareas including Pressure-180 Foot and Pressure-400 Foot Aquifers). Maps will characterize groundwater flow gradients and directions;
3. Chemographs for Cl at available data locations – up to 10 locations;
4. Seawater intrusion maps for years up to 2013 of the Pressure-180 Foot and Pressure-400 Foot Aquifers;
5. Groundwater quality chemographs for NO_3 and EC at available data locations – up to 10 locations (one graph for both constituents with two vertical concentration scales);
6. Groundwater contour maps of NO_3 for selected years in the Forebay and Upper Valley subareas;
7. Groundwater contour maps of EC for selected years in the Forebay and Upper Valley subareas;
8. Groundwater contour maps of Cl for selected years in the Pressure-180 Foot and Pressure-400 Foot Aquifers;

Assumptions:

- The MCWRA will provide GIS maps of groundwater elevations, seawater intrusion boundaries, and water quality maps for the Upper Valley and Forebay Subareas;
- The MCWRA will provide a database of groundwater elevations and water quality results from scheduled annual and August Trough sampling. Additional data may be retrieved from publicly available sources such as USGS and DWR databases.
- The County will provide available precipitation and evapotranspiration data with spatial distributions.
- No Technical Memorandum (TM) will be prepared in the interim for this task. Results will be documented in the State of the Basin report (Task 5).

Task 3. Groundwater Usage

The objectives of this evaluation include trend analysis of groundwater extractions by subareas and valley wide. Water resources in the County of Monterey are provided entirely by groundwater and surface water in the Salinas River. BC will work with MCWRA staff to compile extraction data, river diversion volumes from the Salinas River Diversion Facility (SRDF), and possibly other upstream diversion points for temporal trend analysis.

Deliverables:

1. Ten (10) hydrographs of groundwater pumping by subarea and at selected data locations;
2. Contour maps of groundwater pumping at three (3) selected time snapshots.
3. TM#1 will be prepared summarizing past groundwater usage from available records. This TM will discuss historical development of groundwater usage, and how it has varied in space. Present data gaps will be identified to more fully assess these usages. The TM will also discuss future projections of groundwater use available in existing Groundwater Management and Urban Water Management Plans, based on projected population growth.

Assumptions:

- TM#1 will be issued as Draft and Final. BC will respond to one (1) set of comments on hydrographs and text from County. County is allotted 10 work days to provide comments (see detailed schedule in Attachment D).

- TM#1 will be part of the State of the Basin report (Task 5);
- The County will provide available groundwater extraction data and extraction well location information.

Task 4. Groundwater Storage

The primary objective of this evaluation is to estimate aquifer storage by subarea. Results of this analysis will be used to evaluate available water supply based on aquifer recharge and *changes in storage* (Task 5) that could be affected by continued drought conditions.

BC will work with MCWRA staff to use the compiled groundwater elevation data in Task 2 to evaluate storage. More importantly, water well completion data will be used to characterize the saturated thicknesses and corresponding specific yields in each aquifer and by subarea. Aquifer properties including hydraulic conductivity and calculated specific yields will be provided by MCWRA and retrieved from Salinas Valley Integrated Groundwater Surface Water Model (SVIGSM) model files.

BC will use the geologic cross-sections in past reports, in particular the 2004 MCWRA Hydrostratigraphic Study for the northern portion of the Salinas Valley aquifers in constructing hydrogeologic cross-sections for aquifer characterization. The constructions of additional cross-sections in particular for the southern valley may be required, pending literature search and available information from past reports.

A simplified visual three-dimensional (3D) model will be constructed for all or portions of the Study Area. The 3D conceptual model will be used for visualization and presentation to the County. This model will assist in the construction of the groundwater model in Project 2 (Attachment B).

Deliverables:

1. Ten (10) cross-sections to be constructed or updated to characterize saturated aquifer zones;
2. A 3D representation (visual model) of the Study Area aquifer system (Conceptual Model);
3. Estimated aquifer storage by subarea and aquifer zone; and
4. TM #2, summarizing changes in groundwater storage over time. The TM will be issued as Draft and Final and BC will respond to one (1) set of consolidated comments on cross-sections and text.

Assumptions:

- County will assist in the development of the conceptual model by providing comments on the interpretations of aquifer properties from well data and the geostatistical modeling of spatial aquifer property distributions;
- Records of well construction will be provided by the County;
- Aquifer properties will be provided by MCWRA and refined by BC;
- The County will assist in retrieval of drillers' logs throughout the area.
- The TM #2 in this task will be part of State of the Basin Report (Task 5).

Task 5. State of the Basin Analysis and Report

After completion of Tasks 1 through 4, BC will prepare a State of the Basin Analysis and Report. This report is intended to be a fact based "snapshot" of the condition of the Study Area for use in evaluating if immediate steps are appropriate to address current water supply conditions due to the continuing drought conditions in the Central Coast.

BC hydrologists will prepare the report for non-expert readers. The complex hydrogeologic details that characterize the Study Area will be presented to stakeholders and County of Monterey Board of Supervisors in a narrative supplemented by 3D conceptual model (Task 4).

The State of the Basin Report will present these principal discussions:

- Available water supply for the next five years;
- Changes in the rates and extent of seawater intrusion Groundwater quality and groundwater quality trends in terms of nitrate, EC, and chloride;
- Recommendations of near term actions that are of tactical value under drought conditions and of strategic value as part of long term basin management.
- Data gaps identified to provide a more complete assessment.

Task 5A. Available Water Supply

A water balance analysis will be performed for each of the seven subareas. The analysis will be conducted by comparing groundwater recharge and the Salinas River flow volume with groundwater extraction (usage) on a predetermined time scale. It is noted that groundwater levels have generally been declining in the last two years because of the drought. This means that groundwater extraction is likely depleting available groundwater from long term aquifer storage. This analysis will assess the maximum tolerable groundwater usage from aquifer storage, meaning a safe level of aquifer storage depletion without risking undesirable effects on the aquifer.

BC hydrologists will work with MCWRA staff to review historical data collected under drought conditions and use this information and current demands to predict sustainable yields from aquifers and the Salinas River under continued drought conditions. The analysis will take into account the controlled water releases from the Nacimiento and San Antonio Reservoirs.

Task 5B. Changes in Seawater Intrusion (Pressure and Eastside Subareas)

Chloride concentrations collected by MCWRA from designated seawater intrusion monitoring wells will be plotted against time to look for historical trends (chemographs). Chemographs for each monitoring well location (temporal trends) will be posted on chloride contour maps (spatial trends) to assess 1) the variable rates of seawater intrusion in different geographic areas of the Pressure 180-Foot and Pressure 400-Foot Aquifers and 2) historical variability of intrusion rates through time.

It will be helpful to construct Stiff and Tri-linear diagrams for cation/anion distributions. These diagrams for selected data locations will be posted on chloride contour maps as an additional line of evidence to support apparent changes in spatial and temporal chloride trends attributed to seawater mixing with groundwater. A forecast of plausible changes in the rates of seawater intrusion will be based on water level changes in drought conditions, extrapolated historical chloride trends and cation/anion distributions as discussed above.

Task 5C Groundwater Quality

The analyses of nitrate (NO_3) and EC spatial and temporal distributions are similar to the chloride trend analysis in Task 5B. The analysis will utilize historical data to draw assumptions and conclusions. The conclusions will focus on current and historical in NO_3 and TDS distributions and use them to infer groundwater quality characteristics under prolonged drought conditions.

Task 5D. Conclusions and Recommendations

Conclusions will focus on the potential short term effects on water resources under drought conditions. Recommendations will focus on tactical solutions in mitigating potential negative

impacts by the drought on water supply. Immediate steps to address potential impacts to water supply may include:

- Abandonment and relocation / replacement of water wells that may go dry because of near-term declining water levels in the 180-foot aquifer;
- Deepening of water wells because of changes in water levels in the 180-Foot aquifer;
- Decrease in groundwater extraction rates to conserve available storage during drought conditions;
- Modified pumping schedules;
- Commence the 5-years study with quantitative methods of analyses and continue data collection to augment conclusions and recommendations provided in this short term assessment.

The report will also identify data needed to fully assess conditions and develop appropriate actions.

Task 5E. Report Preparation

In the beginning of this task, BC will work with MCWRA and County staff to prepare and agree on a report format and table of contents. BC will prepare two (2) draft reports for comments by the County and stakeholders.

Deliverables: Two (2) drafts of the State of the Basin reports and one (1) final report. State of the Basin Report will include TM #1 and TM #2 along with conclusions and recommendations.

Assumptions: County will consolidate one set of comments per draft to be responded to by BC.

Task 6. Presentation to the County Board of Supervisors

BC and the MCWRA will jointly present to the County Board of Supervisors (Board) after the second draft of the State of the Basin Report is made available for the Board. BC hydrologists will summarize the findings, conclusions, and recommendations in the draft report. BC will demonstrate the 3D computer model of hydrogeology, seawater intrusion, and groundwater conditions,

Deliverables:

1. Two Board presentations attended by two BC staff. The first Board presentation is to present the Project scope of work and the second will be to present the Final report.;
2. PowerPoint Presentation and Executive Summary of the State of the Basin Report;
3. A 3D computer model demonstration of hydrogeology, seawater intrusion, and groundwater conditions.

Assumptions:

- BC will prepare two sets of PowerPoint presentations and summaries of findings with input from MCWRA.
- BC will commit 16 hours to prepare for each Board Presentation;
- The meetings will be held at County facilities. It is assumed that the meetings will be about four (4) hours total time onsite.

Task 7. Project Management

The BC Project Manager will be Mr. Les Chau. Mr. Chau will be: 1) the primary contact for the County; and, 2) responsible for monthly reports of schedule, budget status, earned value, and invoicing. He will schedule and host teleconference calls and onsite meetings (see deliverables). Project management responsibility for Project 1 is expected for the five months duration.

Deliverables:

1. Five (5) monthly onsite project meetings, attended by three BC staff;
2. Five (5) monthly teleconference project check in calls;
3. Five (5) monthly project status reports that explain: work completed by task; monthly charges; earned value; scheduled activities / milestones for the following month; and issues
4. Monthly invoices that include time cards, subconsultant charges, and other direct charges

Assumptions: No additional assumptions

Attachment B: Scope of Work – Project 2

Project 2 - A five-year study of the Salinas River Groundwater Basin (Zone 2C)

Background

The proposed scope of work for Project 2 is intended to fulfill the requirements of Policy PS-3.1 c.1), 2), 3), 4), 5), and 6) of Exhibit A put forth in the litigation settlement agreement between the Salinas Valley Water Coalition and the County of Monterey. The settlement requirements have been included in the amended 2010 County General Plan Policy PS-3.1 c. which is stated below as project objectives:

Objectives

In this project, Brown and Caldwell (BC) will assist the County of Monterey (County) in accordance with the settlement agreement to prepare a five-year study of Zone 2C of the Salinas River Groundwater Basin for the Board of Supervisors (Board). The Study will be completed in five years with the following objectives:

1) Evaluate existing seawater intrusion and groundwater level data collected by Monterey County Water Resources Agency as of the date the study is commenced;
2) Evaluate the total water demand for existing uses and future uses designated in the General Plan EIR for the year 2030;
3) Assess and provide conclusions regarding the degree to which the total water demand for uses are likely to be reached or exceeded as designated in the General Plan for the year 2030 ;
4) Evaluate on an annual basis during the study period groundwater elevations and extent of the seawater intrusion;
5) Evaluate and provide conclusions regarding future trends and expected changes in groundwater elevations and the extent of seawater intrusion based on historical data and the data produced during the study; and
6) Make recommendations on measures the County could take, should the study conclude that: i) total water demand for uses designated in the General Plan for the year 2030 is likely to be exceeded; or, ii) groundwater elevations are likely to decline by the year 2030; or, iii) the seawater intrusion boundary is likely to advance inland by the year 2030.

Project Schedule

This five year study will commence approximately the same time as the short term (Project 1) study. The study progress and annual results will be presented to the County Board of Supervisors in the Spring of each year through year 2019. The detailed schedule is presented in Attachment D.

Project Description

The proposed project is a five year study of the water supply and groundwater quality in Zone 2C of the Salinas River Groundwater Basin (Study Area). This effort includes a predictive analysis of groundwater and surface water conditions (resources) to the year 2030. Numerical modeling tools will be selected in the beginning of this project to perform simulations of baseline hydrologic conditions, changes in groundwater elevations, and changes in seawater intrusion.

Project Data and Assumptions

This project includes the use of current computer models to represent baseline (current) conditions and predict future changes through the year 2030 in Study Area. Specifically, quantitative analysis involving the computer models will simulate the operations of the source water Nacimiento and San Antonio Reservoirs and the groundwater yield in the Study Area as of reservoir releases.

The computer models developed for this project are designed to be used beyond to assist in long term characterization and management of the Study Area. BC anticipates that the initial use of computer models will have certain data gaps which will be identified as the model is refined in the course of this five year study and beyond. During the five-year study, the model will be updated as additional data becomes available.

The computer models will utilize flow data at gauging stations and reservoir operations information supplied by the MCWRA. The scope of work does not call for new data collections other than those already scheduled for annual collection by MCWRA at designated monitoring points. These annual data will be used to update the model for the water years 2014 to 2018 (5 years) and the model results will be reported in annual project stakeholder and Board meetings.

Land use data input to the model will be based on existing land use information in years 1998, 2014 and projected land use for 2030. The 1998 land use data will be extracted by the MCWRA from the Salinas Valley Integrated Groundwater Surface Water Model (SVIGSM). The 2014 land use data is expected to be available from County Planning and the Agriculture Commissioner. Stakeholder inputs will be part of the 2014 land use data review. Subsequent stakeholder meetings will discuss 2016 and 2018 land use. The 2030 land use data will be those developed in the 2010 General Plan EIR.

The annual changes in land use data as input to the computer simulations will be developed by interpolating the land use data from 1949 to 1998 (in SVIGSM), the current land use data of year 2014 (from County Planning) and future year 2030 (2010 General Plan). The scope of work in this project does not call for the development of new land use data beyond those described above.

Meteorological data input to the model will be precipitation data from water year 1974 to 2014 (40 years). This time span is representative of the hydrologic cycle in the Study Area which includes four droughts (1977, 1989, 1991, 2014) and four above normal rain fall years (1983, 1995, 1998, 2011).

Addressing the 2010 County General Plan Policy PS-3.1 c.

The technical studies and their objectives within the settlement agreement are described in the beginning of this scope of work. The specific tasks in this study to address each objective are summarized herein:

Policy PS-3.1 c. objectives 1, 2, and 4 listed above are addressed primarily in Tasks 1 and 3. This project will devote much effort in the first six months in gathering (Task 1) and analyzing the *data trends* (Task 3 conceptual model) of: groundwater elevations, extent of seawater intrusion, and water usage in the effort to address groundwater and seawater intrusion conditions and develop trend graphs in water demand based on historical land use and future land use and compare them to those prescribed in the 2010 General Plan EIR.

Policy PS-3.1 c. objectives 3 and 5 listed above are addressed in Task 3 and 6. The conceptual model of the basin in Task 3 will support the construction of the groundwater / surface water model (Task 6). Simulations of reservoir operations and the Study Area response to releases from the reservoirs in terms of groundwater yield and surface water flow will be under Task 6. The computer

model will evaluate water demand based on land use data for years 2014 to 2018 and projected water use to 2030.

Policy PS-3.1 c. objective 6 listed above is addressed in Task 8 the Comprehensive 5-Year Study Report and Task 9 annual meeting and presentation to stakeholders and Board. Results from the computer models in Task 6 will provide the basis for drawing conclusions, regarding the total water demand designated in the General Plan for the year 2030 and the likelihood that "modeled demands" will exceed the 2030 projected demand. In addition the report will discuss the likelihood of groundwater elevations decline by the year 2030 and the likelihood of changes in the extent of seawater intrusion by the year 2030.

Project Location

Figure 1 shows the extent of the five-year Study Area as bounded by Zone 2C of the Salinas River Groundwater Basin.

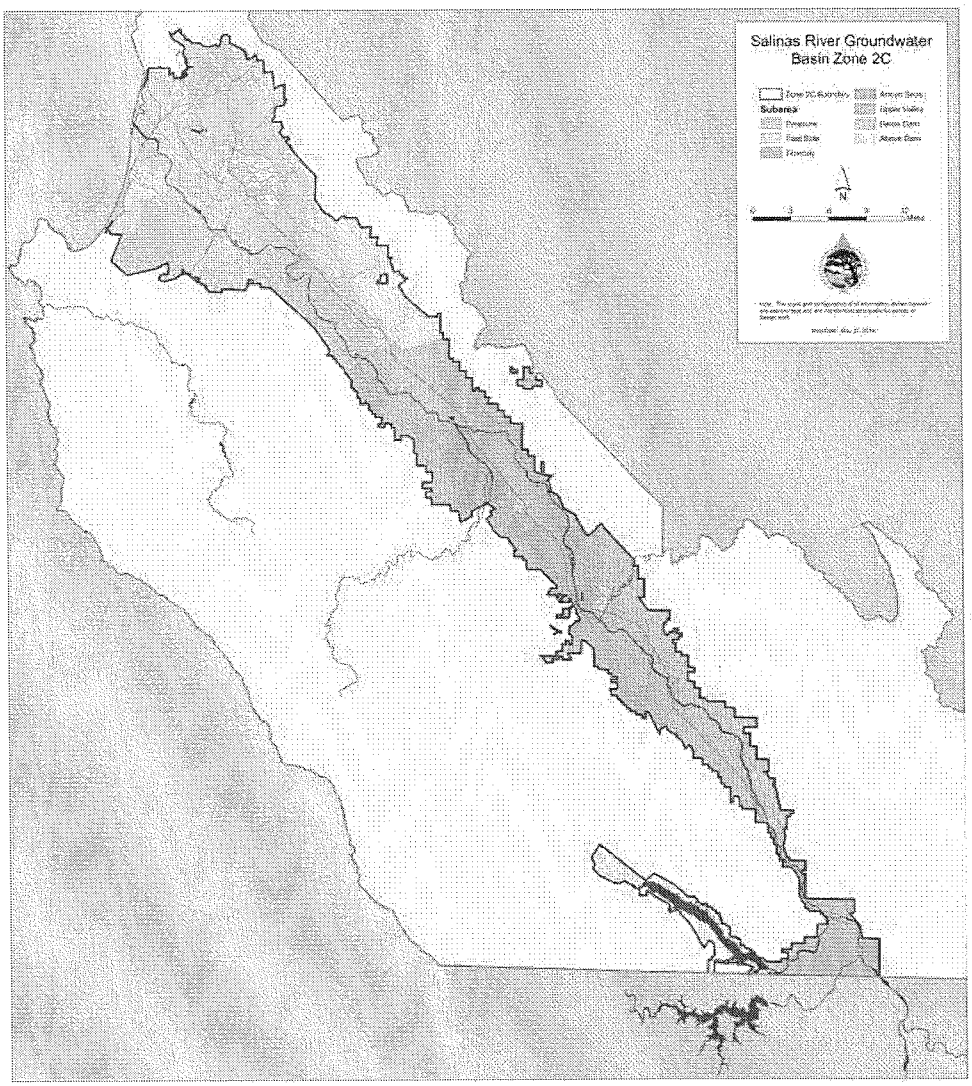


Figure 1. Zone 2C Hydrologic Boundary, County of Monterey

Scope of Work

The following scope of work is a multi-disciplinary approach to providing groundwater and hydrologic consultant services. The intent is to complete various data evaluations to comprehensively address the objectives in the amended 2010 County General Plan Policy PS-3.1 c listed above.

Task 1. Continued data compilation (from Project 1) with focus on numerical model construction

There will be no formal kickoff meeting for Project 2. BC will work with MCWRA on an as-needed basis to review and continue to assemble available background information and hydrology data to be used in this study. The potentially needed information and sources are listed herein:

- 2010 General Plan EIR land use and related planning data - County of Monterey;
- Land use information developed by other consultants – County of Monterey, SVIGSM, MCWRA;
- National hydrography data set for watershed tributary mapping - USGS;
- 2003 Engineer's Report - Salinas Valley Water Project - MCWRA
- SVIGSM data files and results - MCWRA;
- Seaside groundwater model – Monterey Peninsula Water Management District;
- Groundwater / Watershed Model (2013) – San Luis Obispo County Public Works;
- Groundwater elevation database and trend analyses – MCWRA;
- Seawater intrusion monitoring data – MCWRA;
- Groundwater Summary Reports (multiple years) – MCWRA;
- Salinas River channel maintenance program data;
- SRH-2D model files and results - Development of Hydraulic Models for Chualar and Gonzales River Management Units, Salinas River – Newfields 2014
- Salinas River sedimentation and hydraulics - MCWRA
- GIS layers and metadata - MCWRA
- Available database of lithologic logs and well construction information - MCWRA.
- Electronic results of existing aquifer tests - MCWRA.
- Reservoir water levels, releases, and operating scenarios – MCWRA
- Streamflow data from existing and historical stream gaging stations – USGS
- Climatic data including precipitation and evapotranspiration – National Climate Data Center (NCDC).

Deliverables: Updated data bibliography from Project 1 with additional data sources.

Assumptions: BC staff will perform up to 80 hours of additional data review and compilation in the early stages of the project effort and on as-needed basis throughout the duration of this project.

Task 2. SVIGSM model and results review

BC will apply a small and as-needed effort to familiarize with the past groundwater model SVIGSM. BC will work with MCWRA to adapt the aquifer geometry and properties in the SVIGSM as a starting framework for the new integrated surface water / groundwater modeling efforts for Project 2. Data sets likely to include land use, calibration wells, historical reservoir operations, meteorological data, and other information as appropriate.

Deliverables: No formal written deliverables. BC may communicate by e-mail or discuss during project meetings on the progress in adapting the SVIGSM model to this project.

Assumptions:

- County will provide the SVIGSM computer files and Model Report.
- County will assist in extracting certain model data to be used in the new numerical model.

Task 3. Conceptual model development

The objective of this effort is to conceptualize (visualize) the groundwater basin, surface water systems, and surrounding watersheds. BC will work with MCWRA staff to revisit the ten (10) cross-sections developed in Project 1 Task 4 and determine their efficacy for a detailed conceptual hydrologic (groundwater and surface water) model. The conceptual model will be the initial step taken towards the construction of the new Salinas River Groundwater Basin predictive numerical model. The conceptual model will be a work-in-progress with data updates and new interpretations of total data throughout the five-year study.

The intent of this effort is to prepare a detailed representation of the subsurface properties of the Salinas River Groundwater Basin and the surface water features. The conceptual model will be made up of hydrogeologic cross-sections, rendered with geostatistical methods in GIS and a 3D computer visualization model. The model will be documented in a TM and demonstrated to the County, stakeholders, and included presentations to the Board.

The Conceptual Model TM #3 prepared under this task will discuss:

- Final boundary and boundary conditions of the study area
- Background, geology, and historical modeling activities on the Salinas River Groundwater Basin;
- Agreed on approach and methods for developing the conceptual model;
- Data used in this effort (documented in appendices);
- Technical details such as the spatial distribution of aquifer transmissivity and storage assigned to flow zones in the conceptual model;
- Limitations in using the conceptual model; and
- Recommended long term maintenance of the conceptual model.

Deliverables:

1. Enhancement of up to ten (10) cross-section previously developed in Project 1;
2. Constructions of up to ten (10) additional cross-sections as part of a valley wide conceptual hydrologic model;
3. TM #3, conceptual model; one (1) draft and a final TM. MCWRA will be allotted 10 work days to review and comment on the TM (see Attachment D for project schedule);

Assumptions:

- County will continue to assist in the development of the conceptual model (from Project 1) by providing comments on the interpretations of aquifer properties from well data and the geostatistical modeling of spatial aquifer property distributions;
- The new conceptual model will rely on existing reports and data to develop much of the detailed model descriptions.
- TM#3 will be revised once, based on consolidated comments from MCWRA.

Task 4. Assessment and selection of modeling tools

BC will present to the MCWRA staff the potential computer tools that can be applied for the long term quantitative assessments of natural processes and planned engineering projects in the Study Area. In the meeting, BC and MCWRA will discuss and select a set of modeling tools to move forward in the

modeling work. BC will prepare a brief TM #4 to document the discussions and selection of models. TM #4 will discuss the various available modeling tools and their strengths and weaknesses in relation to this Project 2. TM #4 will include a summary table of computer tools. BC will comply with the ASTM Standard Guide for Selecting a Groundwater Modeling Code (ASTM D6170-97). The suite of computer applications that will be reviewed for this task include the following:

- Multi-layered groundwater model – e.g. USGS MODFLOW-USG; or MODFLOW 2005
- 2D surface water sediment transport and flow vectoring model – e.g. USGS MODFLOW SFR / RIVER, USBR SRH-2D;
- Precipitation-runoff (drainage) watershed model – e.g. USGS PRSM;
- Mapping tools – e.g. ESRI ArcGIS™, Spatial Analyst™, 3D Analyst™;
- Land use model – e.g. MODFLOW FARM;
- Seawater Intrusion Model – e.g. MODFLOW SEAWAT, SWI2; and
- 4D Visualization – e.g. Environmental Visualization System™

Deliverables: TM #4, Computer Modeling Tool Selections, one (1) draft and a final TM. MCWRA will be allotted 10 work days to review and comment on the TM.

Cost Assumptions: MCWRA will provide input to the selection of models

Task 5. Groundwater / Surface Water Model Development

This task effort is devoted to the construction of the integrated surface water / groundwater model. Model calibration and sensitivity analyses will be done under Task 6. The groundwater storage analysis 3D model in Project 1 Task 4; the Conceptual Model completed in Task 3, and the SVIGSM aquifer properties will contribute to developing the starting framework for the numerical discretization of the new model (development of finite difference model grid for surface water and groundwater representations). Aquifer properties such as transmissivity, storativity, and leakances will be transferred from the conceptual model to the numerical model. A review of the Final Study Area developed under Task 3 will assist in determining the maximum model domain. BC will comply with the ASTM Standard Guide for model applications (ASTM D5447-04).

Groundwater Model

It is anticipated that the groundwater model will be constructed for simulations in the USGS MODFLOW packages (Task 4). The following hydrologic construction elements will likely be involved:

- Precipitation will likely be accounted for as aerial recharge in the MODFLOW groundwater model;
- Aquifers in Zone 2C alluvial valley will be discretized in 3D as MODFLOW model vertical layers;
- The Nacimiento and San Antonio reservoirs will likely be represented as MODFLOW recharge boundaries and assigned flux based on reservoir operations;

Surface Water Model

- Reservoir operations will be represented in an analytical model which contains the schedule of releases to the Salinas River. The model will be numerically coupled with the groundwater model (i.e. MODFLOW c package) to simulate the integrated response of the river and groundwater systems (i.e. river flow rates and groundwater recharge).
- Watershed runoffs and tributaries of the Study Area will be represented as integrated PRSM and MODFLOW sub-regions;
- The Salinas River will be represented by a 2D flow model such as the MODFLOW SFR package or the USBR SRH-2D. Mass flux from this model will contribute to the recharge / discharge calculations in MODFLOW (i.e. groundwater storage.

Seawater Intrusion Model

- The Pacific Ocean will be a recharge / discharge boundary in MODFLOW;
- The blending of seawater and groundwater will be analyzed by the MODFLOW SEAWAT or SWI2 packages.

Deliverables: Initial model input files and initial model runs. There will be no TM. The initial groundwater / surface water model will be demonstrated in during a project meeting.

Assumptions:

- No calibration runs
- MCWRA will comment on the input files and initial model runs. BC will respond to one (a) set of consolidated comments.

Task 6. Numerical Model Simulation

This effort will involve model setup and calibration of two scenarios: 1) Baseline and 2) Year 2030 Build-out simulations. Model calibration will be based on the designated calibration wells developed for this project. Both scenarios are proposed to be 40 year steady-state and transient simulations calibrated by monthly groundwater elevation data collected by the MCWRA at designated monitoring wells. A Forty year hydrological period includes four droughts (1977, 1989, 1991, and 2014) and four above normal rain fall years (1983, 1995, 1998, and 2011). The length of numerical time-steps will be determined during calibration.

General Methodology

The setup of model scenarios will start with the basic groundwater / surface water model construction completed under Task 5. BC will comply with the ASTM Standard Guide for groundwater simulations (ASTM D5981-96e1). Input data will include land-use information, groundwater elevations, recharge boundaries and discharge points. In addition, precipitation data, runoff, and surface water features will be added into the integrated model for total calibration.

Modeled Hydrologic Period

An initial review of hydrologic period of record suggests that a 40 year simulated period is a good representation and data set for model calibration. This period includes four droughts (1977, 1989, 1991, and 2014) and four above normal rain fall events (1983, 1995, 1998, 2011).

Land Use Model Input

This scope of work constrains the 2030 land use to the level of detail provided in the 2010 General Plan. Historical land use will be extracted from the SVIGSM and other available data sets. The initial 2014 baseline model land use will be adapted from most recent and available land use data. Development of 2014 land use data will engage stakeholder input. Subsequent stakeholder meetings will focus on 2016 and 2018 stakeholder input.

Calibration

BC proposes to use standard calibration approaches for model calibration. BC will comply with the ASTM Standard Guide for Calibrating a Groundwater Flow Model Application (ASTM D5981). BC will discuss calibration residuals and error analysis with MCWRA staff in Project meetings. The planned hydrologic sequence for model calibration is from upstream to downstream. Calibration will be performed for each of the hydrologic units listed below and to achieve 50% calibration before moving to the next downstream unit.

1. Nacimiento and San Antonio reservoirs - source waters;

2. Below Dam Subarea;
3. Upper Valley Subarea;
4. Arroyo Seco Subarea;
5. Forebay Subarea;
6. Eastside Subarea; and
7. Pressure Subarea.

Reservoir Operation

The surface water / groundwater model will be able to establish reservoir releases on a daily basis based on downstream monitoring points with set rules (e.g. optimum stream flow, groundwater levels, SRDF diversion, and Castroville Seawater Intrusion Project (CSIP) demands) that maintain the balance between reservoir releases versus downstream demands.

Reservoir operations will be represented in an analytical model which includes schedules of water released into the Salinas River. The reservoir operations model will be numerically coupled with the groundwater model (i.e. MODFLOW SFR package) to simulate the response of the river and groundwater systems (i.e. river flow rates and groundwater recharge).

Task 6A. Scenario 1 – Baseline Models

There will be five (5) yearly Baseline Model runs as follows:

1. Model run for year 2014 – Existing land use, groundwater elevations, and hydrologic data will be used for model calibration for the year 2014. The model run will include actual data of reservoir releases from years 1974 to 2014. This model run will be presented to the Board in December 2015.

   Deliverable: The model will simulate groundwater elevations contours and extend of seawater intrusion for water year 2014.

2. Model run for Year 2015 – Land use data from the previous year 2014 model run with stakeholder input will be used. Groundwater data collected in calibration wells for 2015 will update the model run. The model run will include actual data of reservoir releases from years 1975 to 2015. This model run will be presented to the Board of Supervisors in the Spring of 2016.

   Deliverable: The model will simulate groundwater elevations contours and extend of seawater intrusion for water year 2015.

3. Model run for Year 2016 – Land use data from the previous year 2014 model run with stakeholder input will be used. Groundwater data collected in calibration wells for 2016 will update the model run. The model run will include actual data of reservoir releases from years 1976 to 2016. This model run will be presented to the Board in the Spring of 2017.

   Deliverable: The model will simulate groundwater elevations contours and extent of seawater intrusion for water year 2016.

4. Model run for Year 2017 – Land use data from the previous year 2014 model run with stakeholder input will be used. Groundwater data collected in calibration wells for 2017 will update the model run. The model run will include actual data of reservoir releases from years 1977 to 2017. This model run will be presented to the Board in the Spring of 2018.

Deliverable: The model will simulate groundwater elevations contours and extent of seawater intrusion for water year 2017.

5. Model run for Year 2018 – Land use data from the previous year 2014 model run with stakeholder input will be used. Groundwater data collected in calibration wells for 2018 will update the model run. The model run will include actual data of reservoir releases from years 1978 to 2018. This model run will be presented to the Board in the Spring of 2019.

   Deliverable: The model will simulate groundwater elevations contours and extend of seawater intrusion for water year 2018.

Assumptions for the five model runs: MCWRA will provide comments on the results of all model runs. BC will respond to one (1) set of consolidated comments for TM #5 stated below.

Task 6B. Scenario 1 - Sensitivity Analysis

Aquifer properties such as vertical and horizontal hydraulic conductivity and storage will be analyzed for the years 2014 and 2018. There is not a need to look at sensitivities for each year. The parameters in this analysis are static values and do not change over time.

Cost Assumption: No new cross-sections and aquifer properties will be added to the model.

Additional Deliverable for Tasks 6A and 6B: Scenario 1 Baseline Model Report (TM #5 draft and final). The report will describe model methodology, model setup, calibration results, parameter sensitivity analysis, and model results for the five model runs. Data used for calibration will be included in appendices. County is allotted 10 work days to review and provide comments.

Additional Assumptions: BC will respond to one (1) set of consolidated comments by the County on the draft report.

Task 6C. Scenario 2 – Year 2030 Build-out Model

Scenario 2 consists of one model run for the year 2030 with project build-outs.

1. Model run for Year 2030 – Land use data for 2014, 2018, and from the projections in the 2010 General Plan EIR will be used for the year 2030. Land use data for years 2019 to 2029 will be interpolated between land use data used in the year 2018 and 2030. There will be no available calibration data as of year 2019 to 2030.

   BC will apply best scientific practices to review available studies and discuss data that are relevant to the ramifications of climate change in Zone 2C. More specifically, BC hydrologists will qualitatively assess the impacts (if any) of changes in precipitation and sea level to the water supply, water quality, and flood zones. Most of the information will be compiled from the 2010 General Plan EIR climate change discussions and data in completing this task.

   Model Scenario 2 is entirely a predictive simulation of the Study Area's response to the MCWRA's currently operated water supply projects

Deliverable for Scenario 2

1. The model will simulate groundwater elevations contours and seawater intrusion boundaries for water year 2030.

2. Scenario 2 Year 2030 Build-out Model Report (TM #6). The report will describe model methodology, model setup, and model results. Data used for model development will be included in appendices.

Assumptions:

- BC will respond to one (1) set of comments by the County.
- Only MCWRA currently operated water supply projects will be included in the surface water / groundwater model.

Task 7. Stakeholder Outreach

BC will work with the County and MCWRA to strategize and prepare a stakeholder outreach plan for Project 2. The idea is to engage stakeholders early on in the project to inform them of the intent of the five year study. BC proposes to conduct a total of four stakeholder meetings.

Meeting 1 – Initial presentation of proposed long term Basin study;

Meeting 2 – Discuss land use for model years 2015 to 2018;

Meeting 3 – Discuss interim findings;

Meeting 4 – Discuss final report.

Deliverables:

1. Fact sheets or equivalent information handouts.
2. Initial meeting hosted by BC to present the purpose and proposed details of study;
3. Three meetings hosted by BC to present findings.

Assumptions:

- The meetings are expected to be about three hours and divided into two sessions each – presentation and open forum discussions.
- BC will commit up to 8 hours of preparation for each of the four meetings.
- Meetings will be held in a County designated location.

Task 8. Comprehensive Report - Groundwater/Surface Water Study

BC will prepare a comprehensive report to be submitted by August 2019. The report will be a culmination of the five year study summarizing the data collected each year, and modeling predictions of available water supply versus demand based on projected land use in the 2010 General Plan EIR.

The Final Comprehensive Report – Groundwater / Surface Water Study (Basin Study) Report will present these principal discussions:

- Current status of seawater intrusion and groundwater levels
- Changes in groundwater elevations, seawater intrusion rates and extent of seawater intrusion on an annual basis based on historical data, data produced during this study, and computer simulations;
- Computer simulated total groundwater and surface water demand for annualized uses compared to estimates in the General Plan EIR for the year 2030;
- Recommendations of long term actions that are of strategic value and as part of long term basin management.
- Documented data gaps.

Deliverables: Two (2) drafts of the Basin Study reports and one (1) final report. The Basin Report will include TM#3 to TM#6 and a set of final conclusions and recommendations.

Assumptions: BC will respond to two (2) sets of comments by the County on each of the two (2) draft reports. The county is allotted 20 work days to review each of the draft report and provide consolidated comments.

Task 9. Presentation to the County Board of Supervisors

BC and the MCWRA will jointly present to the Board **Deliverables:**

1. Six Board presentations;
2. Executive Summary of the Basin Report;
3. A 3D computer model demonstration of hydrogeology (Task 3, 6, and 7), Seawater intrusion, and groundwater conditions.

Assumptions:

- The meetings will be held in a County designated location.
- BC will have at least one attendee in each of the six meetings.

Task 10. Technical Advisory Committee Agenda and Management

BC will work with MCWRA to develop an agenda for expert advisors to participate in a Technical Advisory Committee (TAC). The selection and solicitations of advisors will be conducted under this task. BC and MCWRA will determine the level of effort of the TAC.

The objective of the TAC is to serve as a body of expert advisors on hydrology and groundwater surface water modeling techniques.

Deliverables:

TM #7 will capture TAC agendas and outcomes of meetings. MCWRA and the County will provide input on a final TM.

Assumptions:

- MCWRA and the County will oversee and coordinate the TAC. BC will participate in TAC discussions and assist the TAC in clarifications of technical matters.

Task 11. Project Management

The BC Project Manager will be Mr. Les Chau. Mr. Chau will be: 1) the primary contact for the County, 2) responsible for monthly reports of schedule, budget status, earned value, and invoicing.

Deliverables:

1. Monthly onsite project meetings, attended by three BC staff;
2. Monthly teleconference project check in calls;
3. Monthly project status report that explains: work completed by task; monthly charges; earned value; scheduled activities / milestones for the following month; and issue/ challenges.
4. Monthly invoices that include time cards, subconsultant charges, and other direct charges

Assumptions: Project management activities will be on monthly basis for the first two years. Project management activities will curtail to quarterly reporting in the last three (3) years of Project 2.

References

1. Monterey County Board of Supervisors Referral Submittal Form – 4/12/2010
2. Environmental Impact Report - County of Monterey 2010 General Plan;
3. Hydrologic Reponses to Climate Change and Habitat Resiliency Illustrated Using Fine-Scale Watershed Modeling – USGS;
4. Hydrostratigraphic Analysis Of The Northern Salinas Valley – Kennedy/Jenks 2004
5. 2008 Groundwater Summary Report – MCWRA 2010
6. Development of Hydraulic Models for Chualar and Gonzales River Management Units, Salinas River – Newfields 2014
7. Hydrologic Framework of Recharge and Seawater Intrusion in the Pajaro Valley, Santa Cruz, and Monterey Counties, California – USGS;
8. Protective Elevations to Control Sea Water Intrusion in the Salinas Valley – Geosciences 2013;
9. Engineer's Report, Salinas Valley Water Project – RMC 2003.

Attachment C: Detailed Budget

Attachement C - Proposed Budget - Salinas River Valley Basin Study

Attachment C - Proposed Budget Salinas River Valley Basin Study	Estimated effort (total hours)	Estimated Budget
Task Name **Total Effort (hrs. & $)**	4286	$773,873
Project 1 - Near Term Study of Basin Status	626	$102,877
Task 1 - Project Kickoff and Data Review	46	$7,487
Project Kickoff and Initial Data Review	40	$6,967
Deliverable: Meeting notes	6	$520
Task 2 - Trend Analyses	48	$6,843
Task 2a - Groundwater Elevation Trends (short / long terms)	12	$1,655
Task 2b - Seawater Intrusion Trends (short / long term)	16	$2,332
Task 2c - Water Quality Trends	17	$2,501
Deliverables: Hydrograph and maps. No TM	3	$355
Note: Requested MCWRA assistance ~ 60%. The MCWRA will provide GIS basemaps and data for groundwater elevations and water quality for contouring in the Upper Valley and Forebay	0	$0
Task 3 - Groundwater Usage	31	$6,845
Groundwater Usage	30	$6,758
Deliverable TM #1 (one draft, one final)	1	$87
Note: Requested MCWRA assistance ~ 25%	0	$0
Task 4 - Groundwater Storage	138	$25,527
Groundwater Storage	64	$11,960
Deliverable: Ten (10) cross-sections	24	$5,432
Deliverable TM #2 (one draft, one final)	30	$3,804
Deliverable: 3D Conceptual Model - For presentation only	20	$4,331
Note: Requested MCWRA assistance ~ 25%		
Task 5 - State of the Basin Report	210	$36,165
Task 5a - Available Water Supply	16	$3,881
Task 5b - Changes in Seawater Intrusion (Pressure / Eastside)	36	$6,696
Task 5c - Groundwater quality (Upper Valley / Forebay Subareas)	28	$5,092
Task 5d - Conclusions and Recommendations	62	$13,893
Task 5e - Deliverable - Report Preparation (Two drafts (2) and one (1) Final)	68	$6,603
Task 6 - Presentation to County BOS	88	$8,392
Presentation to County BOS (2 meetings, attended by 1.5 staffs)	44	$4,750

Attachement C - Proposed Budget - Salinas River Valley Basin Study

Attachment C - Proposed Budget Salinas River Valley Basin Study	Estimated effort (total hours)	Estimated Budget
Meeting Preparation	44	$3,642
Note: Joint BC / MCWRA presentations		
Task 7 - Project Management	65	$11,618
Five On-site meetings, 5 teleconference meetings	29	$7,104
Five Monthly Project Status Reports	20	$2,974
Five monthly invoices	16	$1,540
Project 2 - Five Years Basin Study	3660	$670,996
Task 1 - Continued Data Compilation	93	$15,384
Continued data compilation (from Project 1)	84	$14,383
Deliverable: Updated data bibliography	9	$1,001
Note: Requested MCWRA assistance ~ 15%	0	$0
Task 2 - SVIGSM Review	40	$6,892
SVIGSM model and results review	40	$6,892
Note: Requested MCWRA assistance ~ 50%	0	$0
Task 3 - Conceptual Model	402	$75,525
Conceptual model development	246	$46,392
Deliverable: ten (10) updated cross-sections	60	$11,422
Deliverable: ten (10) new cross-sections	52	$9,611
Deliverable TM #3 (one draft, one final)	44	$8,099
Note: Requested MCWRA assistance ~ 20%	0	$0
Task 4 - Modeling Tools Assessment/Selection	40	$8,023
Assessment and selection of modeling tools	28	$5,751
Deliverable TM #4 (one draft, one final)	12	$2,273
Note: Requested MCWRA assistance ~ 20%	0	$0
Task 5 - GW/SW Model Development	544	$98,645
Groundwater / Surface Water Model Development	544	$98,645
Deliverable: Model input and output files. No TM		
Note: Requested MCWRA assistance ~ 10%	0	$0
Task 6 - Numerical Model Simulation	1398	$237,438
Task 6a - Scenario 1 – Baseline Model Year 2014	194	$32,986

Attachement C - Proposed Budget - Salinas River Valley Basin Study

Attachment C - Proposed Budget Salinas River Valley Basin Study	Estimated effort (total hours)	Estimated Budget
Task 6a - Scenario 1 – Baseline Model Year 2015	194	$32,986
Task 6a - Scenario 1 – Baseline Model Year 2016	194	$32,986
Task 6a - Scenario 1 – Baseline Model Year 2017	194	$32,986
Task 6a - Scenario 1 – Baseline Model Year 2018	194	$32,986
Task 6b - Scenario 1 - Sensitivity Analysis	108	$18,806
Task 6c - Scenario 2 – Year 2030 Build-out Model	252	$46,377
Deliverables: Contour maps of model outputs. No TM	68	$7,322
Note: Requested MCWRA assistance ~ 7%	0	$0
Task 7 - Stakeholder Outreach	96	$13,493
Stakeholder Outreach (4 meetings, 4 hours each, 2 staffs)	0	$0
Meeting 1 – Initial presentation of proposed long term Basin study;	14	$2,438
Meeting 2 – Discuss land use for model years 2015 to 2018;	14	$2,438
Meeting 3 – Discuss interim findings;	12	$1,948
Meeting 4 – Discuss final report.	12	$1,948
Deliverable: 4 fact sheets	44	$4,720
Note: Requested MCWRA assistance ~ 70%	0	$0
Task 8 - Comp Report-GW/Surface Water Study	524	$84,159
Comprehensive Report (two drafts, one final)	524	$84,159
Note: Requested MCWRA assistance ~ 15%	0	$0
Task 9 - Presentation to the County	131	$25,115
Presentation to the County Board of Supervisors (6 meetings, 3 hrs. onsite per meeting, one staff attendance)	91	$17,990
Deliverable: Executive Summary of Report	16	$2,653
Deliverable: 3D Computer Model for Presentation Only	24	$4,471
Note: MCWRA presenter	0	$0
Task 10 - TAC Agenda & Management	68	$31,312
Technical Advisory Committee Agenda and Management	68	$11,312
Note: Requested MCWRA assistance ~ 50%	0	$0
TAC member stipends		$20,000
Task 11 - Project Management	324	$75,011
Project Management	30	$7,799
On-site meetings (first 3 years)	84	$20,502
Monthly Project Status Reports (first 2 years)	130	$19,009

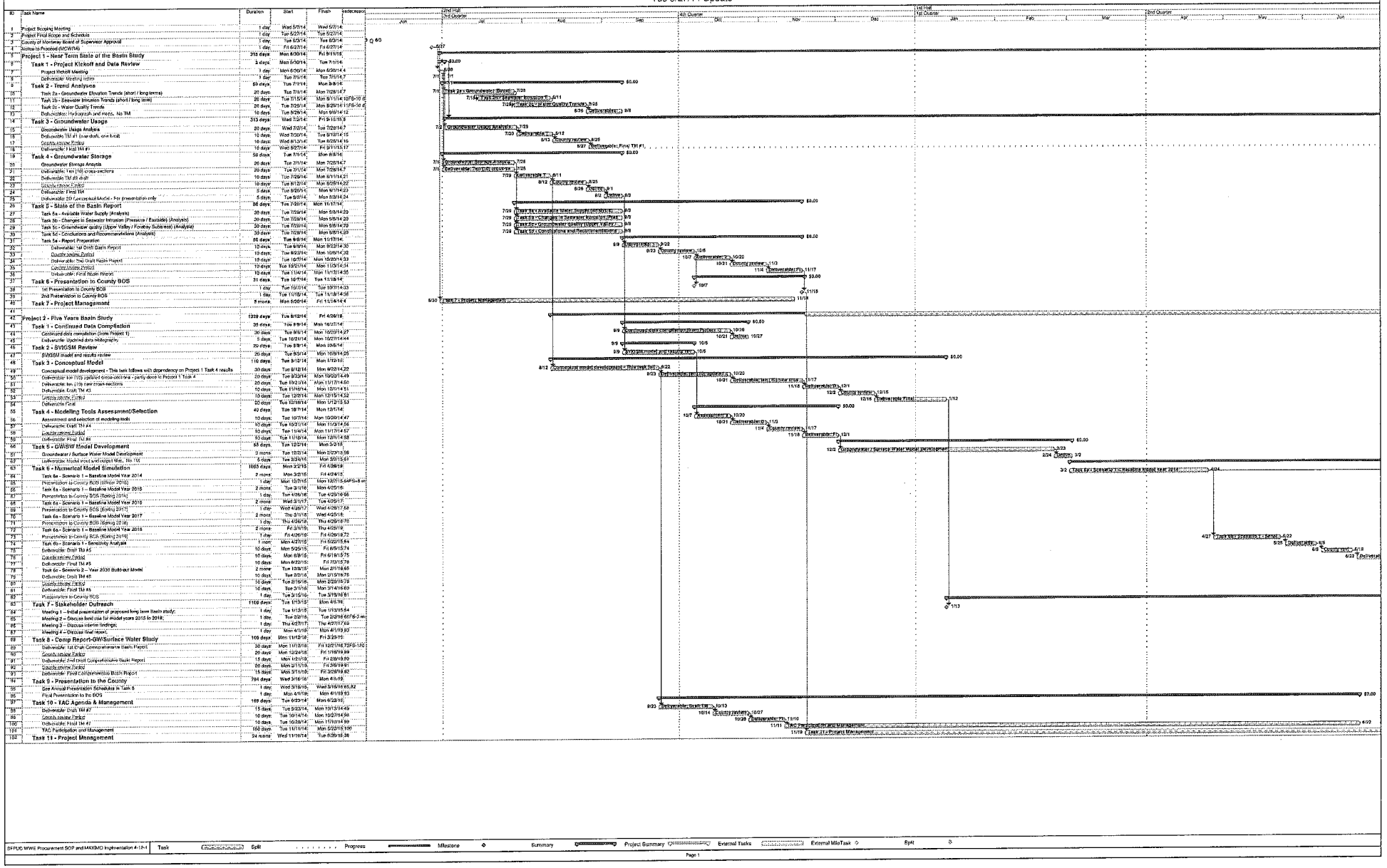
Attachement C - Proposed Budget - Salinas River Valley Basin Study

Attachment C - Proposed Budget Salinas River Valley Basin Study	Estimated effort (total hours)	Estimated Budget
Monthly invoices (Five years)	80	$7,701
ODC - Project expenses (tentatively for 3 years)	0	$20,000
Note: All ODC must be preapproved by MCWRA	0	$0
New Total Hours (12-27-13)	**4286**	
Total Labor Budget		**$773,873**

Attachment D: Detailed Schedule

EXHIBIT A

Attachment D - Project Schedule
Salinas Valley Groundwater Basin Studies
Tue 5/27/14 Update



ID	Task Name	Duration	Start	Finish	Predecessors
1	Project Scoping Meeting	1 day	Wed 5/7/14	Wed 5/7/14	
2	Project Final Scope and Schedule	1 day	Tue 5/27/14	Tue 5/27/14	
3	County of Monterey Board of Supervisor Approval	1 day	Tue 6/3/14	Tue 6/3/14	2
4	Notice to Proceed (MCWRA)	1 day	Fri 6/27/14	Fri 6/27/14	
5	**Project 1 - Near Term State of the Basin Study**	315 days	Mon 6/30/14	Fri 9/11/15	
6	**Task 1 - Project Kickoff and Data Review**	5 days	Mon 6/30/14	Tue 7/1/14	
7	Project Kickoff Meeting	1 day	Mon 6/30/14	Mon 6/30/14	4
8	Deliverable: Meeting notes	1 day	Tue 7/1/14	Tue 7/1/14	7
9	**Task 2 - Trend Analyses**	60 days	Tue 7/1/14	Mon 9/8/14	
10	Task 2a - Groundwater Elevation Trends (short / long terms)	20 days	Tue 7/1/14	Mon 7/28/14	7
11	Task 2b - Seawater Intrusion Trends (short / long term)	20 days	Tue 7/15/14	Mon 8/11/14	10FS-10 d
12	Task 2c - Water Quality Trends	20 days	Tue 7/29/14	Mon 8/25/14	11FS-10 d
13	Deliverable: Hydrograph and maps - No TM	10 days	Tue 8/26/14	Mon 9/8/14	12
14	**Task 3 - Groundwater Usage**	313 days	Wed 7/2/14	Fri 9/11/15	5
15	Groundwater Usage Analysis	20 days	Wed 7/2/14	Tue 7/29/14	7
16	Deliverable: TM #1 (overdraft, safe yield)	10 days	Wed 7/30/14	Tue 8/12/14	15
17	County review Period	10 days	Wed 8/13/14	Tue 8/26/14	16
18	Draft transfer Final TM #1	10 days	Wed 8/27/14	Fri 9/11/15	17
19	**Task 4 - Groundwater Storage**	50 days	Tue 7/1/14	Mon 9/8/14	
20	Groundwater Storage Analysis	20 days	Tue 7/1/14	Mon 7/28/14	7
21	Deliverable: Ten (10) cross-sections	20 days	Tue 7/1/14	Mon 7/28/14	7
22	Deliverable: TM #3 draft	10 days	Tue 7/29/14	Mon 8/11/14	21
23	County review Period	10 days	Tue 8/12/14	Mon 8/25/14	22
24	Deliverable: Final TM	5 days	Tue 8/26/14	Mon 9/1/14	23
25	Deliverable: 2D Conceptual Model - For presentation only	5 days	Tue 8/26/14	Mon 9/8/14	24
26	**Task 5 - State of the Basin Report**	96 days	Tue 7/29/14	Mon 11/17/14	
27	Task 5a - Available Water Supply (Analysis)	30 days	Tue 7/29/14	Mon 9/8/14	20
28	Task 5b - Changes in Seawater Intrusion (Presente / Excusion) (Analysis)	20 days	Tue 7/29/14	Mon 8/25/14	20
29	Task 5c - Groundwater quality (Upper Valley / Forebay Subareas) (Analysis)	20 days	Tue 7/29/14	Mon 8/25/14	20
30	Task 5d - Conclusions and Recommendations (Analysis)	30 days	Tue 7/29/14	Mon 9/8/14	20
31	Task 5e - Report Preparation	60 days	Tue 9/9/14	Mon 11/17/14	
32	Deliverable: 1st Draft Basin Report	10 days	Tue 9/9/14	Mon 9/22/14	30
33	County review Period	10 days	Tue 9/23/14	Mon 10/6/14	32
34	Deliverable: 2nd Draft Basin Report	10 days	Tue 10/7/14	Mon 10/20/14	33
35	County review Period	10 days	Tue 10/21/14	Mon 11/3/14	34
36	Deliverable: Final Basin Report	10 days	Tue 11/4/14	Mon 11/17/14	35
37	**Task 6 - Presentation to County BOS**	31 days	Tue 10/7/14	Tue 11/18/14	
38	1st Presentation to County BOS	1 day	Tue 10/7/14	Tue 10/7/14	33
39	2nd Presentation to County BOS	1 day	Tue 11/18/14	Tue 11/18/14	38
40	**Task 7 - Project Management**	5 mons	Mon 6/30/14	Fri 11/14/14	
41					
42	**Project 2 - Five Years Basin Study**	1239 days	Tue 8/12/14	Fri 4/26/19	
43	**Task 1 - Continued Data Compilation**	35 days	Tue 8/9/14	Mon 10/27/14	
44	Continued data compilation (from Project 1)	30 days	Tue 8/9/14	Mon 10/20/14	27
45	Deliverable: Updated data bibliography	5 days	Tue 10/21/14	Mon 10/27/14	44
46	**Task 2 - SVSIM Review**	20 days	Tue 8/9/14	Mon 9/8/14	
47	SVSIM model and results review	20 days	Tue 8/9/14	Mon 9/8/14	25
48	**Task 3 - Conceptual Model**	110 days	Tue 8/12/14	Mon 1/12/15	
49	Conceptual model development - This task follows with dependency on Project 1 Task 4 results	30 days	Tue 8/12/14	Mon 9/22/14	22
50	Deliverable: ten (10) updated cross-sections - partly done in Project 1 Task 4	20 days	Tue 8/26/14	Mon 9/29/14	49
51	Deliverable: ten (10) new cross-sections	20 days	Tue 8/26/14	Mon 10/27/14	50
52	Deliverable: Draft TM #3	10 days	Tue 11/18/14	Mon 12/1/14	51
53	County review Period	10 days	Tue 12/2/14	Mon 12/15/14	52
54	Deliverable Final	20 days	Tue 12/16/14	Mon 1/12/15	53
55	**Task 4 - Modeling Tools Assessment/Selection**	40 days	Tue 10/7/14	Mon 12/1/14	
56	Assessment and selection of modeling tools	10 days	Tue 10/7/14	Mon 10/20/14	47
57	Deliverable: Draft TM #4	10 days	Tue 10/21/14	Mon 11/3/14	56
58	County review Period	10 days	Tue 11/4/14	Mon 11/17/14	57
59	Deliverable: Final TM #4	10 days	Tue 11/18/14	Mon 12/1/14	58
60	**Task 5 - GW/SW Model Development**	68 days	Tue 12/2/14	Mon 3/2/15	
61	Groundwater / Surface Water Model Development	3 mons	Tue 12/2/14	Mon 2/23/15	56
62	Deliverable: Model input and output files - No TM	5 days	Tue 2/24/15	Mon 3/2/15	61
63	**Task 6 - Numerical Model Simulation**	1665 days	Mon 3/2/15	Fri 4/26/19	
64	Task 6a - Scenario 1 – Baseline Model Year 2014	2 mons	Mon 3/2/15	Fri 4/24/15	
65	Presentation to County BOS (Winter 2015)	1 day	Mon 12/7/15	Mon 12/7/15	64FS+8 m
66	Task 6a - Scenario 1 – Baseline Model Year 2015	2 mons	Tue 3/1/16	Mon 4/25/16	
67	Presentation to County BOS (Spring 2016)	1 day	Tue 4/26/16	Tue 4/26/16	66
68	Task 6a - Scenario 1 – Baseline Model Year 2016	2 mons	Wed 3/1/17	Tue 4/25/17	
69	Presentation to County BOS (Spring 2017)	1 day	Wed 4/26/17	Wed 4/26/17	68
70	Task 6a - Scenario 1 – Baseline Model Year 2017	2 mons	Thu 3/1/18	Wed 4/25/18	
71	Presentation to County BOS (Spring 2018)	1 day	Thu 4/26/18	Thu 4/26/18	70
72	Task 6a - Scenario 1 – Baseline Model Year 2018	2 mons	Fri 3/1/19	Thu 4/25/19	71
73	Presentation to County BOS (Spring 2019)	1 day	Fri 4/26/19	Fri 4/26/19	72
74	Task 6b - Scenario 1 – Sensitivity Analysis	1 mon	Mon 4/27/15	Fri 5/22/15	64
75	Deliverable: Draft TM #5	10 days	Mon 5/25/15	Fri 6/5/15	74
76	County review Period	10 days	Mon 6/8/15	Fri 6/19/15	75
77	Deliverable: Final TM #5	10 days	Mon 6/22/15	Fri 7/3/15	76
78	Task 6c - Scenario 2 – Year 2030 Build-out Model	2 mons	Tue 12/8/15	Mon 2/1/16	65
79	Deliverable: Draft TM #6	10 days	Tue 2/2/16	Mon 2/15/16	78
80	County review Period	10 days	Tue 2/16/16	Mon 2/29/16	79
81	Deliverable: Final TM #6	10 days	Tue 3/1/16	Mon 3/14/16	80
82	Presentation to County BOS	1 day	Tue 3/15/16	Tue 3/15/16	81
83	**Task 7 - Stakeholder Outreach**	1169 days	Tue 1/13/15	Mon 4/1/19	
84	Meeting 1 – Initial presentation of proposed long term Basin study;	1 day	Tue 1/13/15	Tue 1/13/15	64
85	Meeting 2 – Discuss land use for model years 2015 to 2018;	1 day	Tue 2/2/16	Tue 2/2/16	66FS-3 m
86	Meeting 3 – Discuss interim findings;	1 day	Thu 4/27/17	Thu 4/27/17	69
87	Meeting 4 – Discuss final report.	1 day	Mon 4/1/19	Mon 4/1/19	83
88	**Task 8 - Comp Report-GW/Surface Water Study**	199 days	Mon 11/2/15	Fri 3/23/16	
89	Deliverable: 1st Draft Comprehensive Basin Report	30 days	Mon 11/2/15	Fri 12/11/15	75FS-120
90	County review Period	20 days	Mon 12/14/15	Fri 1/8/16	89
91	Deliverable: 2nd Draft Comprehensive Basin Report	15 days	Mon 1/25/16	Fri 2/12/16	90
92	County review Period	20 days	Mon 2/15/16	Fri 3/11/16	91
93	Deliverable: Final Comprehensive Basin Report	15 days	Mon 3/14/16	Fri 3/25/16	92
94	**Task 9 - Presentation to the County**	794 days	Wed 3/16/16	Mon 4/1/19	
95	See Annual Presentation Schedule in Task 6	1 day	Wed 3/16/16	Wed 3/16/16	65,82
96	Final Presentation to the BOS	1 day	Mon 4/1/19	Mon 4/1/19	83
97	**Task 10 - TAC Agenda & Management**	169 days	Tue 6/23/15	Mon 2/22/16	
98	Deliverable: Draft TM #7	15 days	Tue 9/22/15	Mon 10/12/15	49
99	County review Period	10 days	Tue 10/13/15	Mon 10/26/15	98
100	Deliverable: Final TM #7	10 days	Tue 10/20/15	Mon 11/2/15	99
101	TAC Participation and Management	160 days	Tue 11/11/14	Mon 5/25/15	100
102	**Task 11 - Project Management**	34 mons	Wed 11/19/14	Tue 8/30/16	36