



Post Office Box 3544  
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(805) 525-4431  
<https://moundbasingsa.org>

**NOTICE IS HEREBY GIVEN that the  
Mound Basin Groundwater Sustainability Agency (“Agency”)  
Board of Directors (“Directors”) will hold a  
REGULAR BOARD MEETING at 1:00 P.M. on  
Thursday, January 17, 2019  
at Ventura City Hall, Santa Cruz Conference Room #223  
501 Poli Street, Ventura, California 93001**

**MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY  
BOARD OF DIRECTORS MEETING AGENDA**

**CALL TO ORDER 1:00 p.m.**

**1. PLEDGE OF ALLEGIANCE**

**2. PUBLIC COMMENTS ON ITEMS NOT APPEARING ON THE AGEND**

The Board will receive public comments on items not appearing on the agenda and within the subject matter jurisdiction of the Agency. The Board will not enter into a detailed discussion or take any action on any items presented during public comments. Such items may only be referred to the Executive Director or other staff for administrative action or scheduled on a subsequent agenda for discussion. Persons wishing to speak on specific agenda items should do so at the time specified for those items. In accordance with Government Code § 54954.3(b)(1), public comment will be limited to three (3) minutes per speaker per issue.

**3. ROLL CALL**

**4. APPROVAL OF AGENDA  
Motion**

**5. CONSENT CALENDAR**

**All matters listed under the Consent Calendar are considered routine by the Board and will be enacted by one motion. There will be no separate discussion of these items unless a Board member pulls an item from the Calendar. Pulled items will be discussed and acted on separately by the Board. Members of the public who want to comment on a Consent Calendar item should do so under Public Comments. (ROLL CALL VOTE REQUIRED)**

**5a Approval of Minutes  
Motion**

The Board will consider approving the Minutes from the October 18, 2018 Mound Basin GSA Board of Directors meeting.

**5b Approval of Warrants  
Motion**

The Board will consider approving payment of outstanding vendor invoices.

**5c Monthly Financial Reports  
Information Item**

The Board will receive a monthly profit and loss statement and balance sheet for the Mound Basin GSA from UWCD’s accounting staff.

**5d Board Meeting Schedule for Calendar Year 2019  
Information Item**

The Board will consider approving the 2019 Regular Board Meeting Schedule as submitted or as modified by the Board.

**6. BOARD MEMBER ANNOUNCEMENTS**

**7. EXECUTIVE DIRECTOR UPDATE**

The Executive Director will provide an informational update on Agency activities since the previous Board meeting.

**8. ACTION ITEMS**

**8a. Agency Officer Appointments and Required Bond  
Motion**

The Board will consider appointing a chair, vice chair/secretary, and a treasurer to serve during calendar year 2019. The Board will also provide direction concerning obtaining a bond for the Treasurer.

**8b. Groundwater Extraction Fee Payment Update  
Motion**

The Board will receive an update from staff concerning the 2018-1 groundwater extraction fee payments and consider providing direction to staff concerning the 2018-2 extraction fee invoicing.

**8c. GSP Development Options (Grant Category (c): Planning Activities; Task 2: Organizational Activities)  
Motion**

The Executive Director will provide an update on discussions with United Water Conservation District (UWCD) concerning technical support services for the GSP, discuss options for servicing various GSP elements, and provide direction to staff.

**8d. Isotope Study (Grant Category (b): Models and Studies)  
Motion**

The Board will consider approving professional services by S.S. Papadopoulos and Associates to assist the Agency with completing the isotope study described in the GSP Grant application.

**9. INFORMATION ITEMS**

None.

**10. FUTURE AGENDA ITEMS**

**ADJOURNMENT**

The Board will adjourn to the next **Regular Board Meeting** on Thursday, **February 21, 2019** or call of the Chair.

Mound Basin GSA Board of Directors Meeting Agenda

January 17, 2019

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*Materials, which are non-exempt public records and are provided to the Board of Directors to be used in consideration of the above agenda items, including any documents provided subsequent to the publishing of this agenda, are available for inspection at UWCD's offices at 106 North 8<sup>th</sup> Street in Santa Paula during normal business hours.*

*The Americans with Disabilities Act provides that no qualified individual with a disability shall be excluded from participation in, or denied the benefits of, the District's services, programs or activities because of any disability. If you need special assistance to participate in this meeting, or if you require agenda materials in an alternative format, please contact the Mound Basin Clerk of the Board at (805) 525-4431 or the City of Ventura at (805) 654-7800. Notification of at least 48 hours prior to the meeting will enable the Agency to make appropriate arrangements.*

Approved: \_\_\_\_\_

  
**Executive Director Bryan Bondy**

**Posted: (date) January 11, 2019 (time) 10:00a.m. (attest) Kris Sofley**  
**At: <https://moundbasingsa.org>**

**Posted: (date) January 11, 2019 (time) 10:15a.m. (attest) Kris Sofley**  
**At: <https://www.facebook.com/moundbasingsa/>**

**Posted: (date) January 11, 2019 (time) 10:05a.m. (attest) Kris Sofley**  
**At: United Water Conservation District, 106 N 8<sup>th</sup> Street, Santa Paula CA 93060**

**Posted: (date) January, 11, 2019 (time) 10:00a.m. (attest) Debra Martinez**  
**At: Ventura City Hall, 501 Poli Street, Ventura, California 93001**



**MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY**  
**BOARD OF DIRECTORS MEETING MINUTES**

Thursday, October 18, 2018, 1:30p.m.

County of Ventura's Public Works Agency – Saticoy Operations Yard  
11251-A Riverbank Drive, Ventura, California 93004

**MINUTES**

**DIRECTORS IN ATTENDANCE:**

Kevin Brown, Vice Chair  
Jim Chambers  
Conner Everts  
Mike Mobley, Chair  
Glenn Shephard, Treasurer

**STAFF IN ATTENDANCE:**

Bryan Bondy, Executive Director  
Kris Sofley, Clerk of the Board

**PUBLIC IN ATTENDANCE:**

Dan Detmer, UWCD  
Erin Gorospe, UWCD  
Burt Havpy  
Bruce Kuebler, Ventura River Water District  
Neal Maguire, Ferguson Case Orr Paterson LLP  
Jennifer Tribo, Ventura Water

**CALL TO ORDER 1:32p.m.**

Chair Mobley called the meeting to order and led everyone in the Pledge of Allegiance. He then asked if there were any public comments.

**1. PUBLIC COMMENTS ON ITEMS NOT APPEARING ON THE AGENDA**

None were offered.

**2. ROLL CALL**

All Directors of the Mound Basin GSA Board of Directors were in attendance as demonstrated by their responses to the roll call.

**3. APPROVAL OF AGENDA**

**Motion**

Motion to approve the agenda, Director Everts; Second, Director Shephard. Voice vote: five ayes (Brown, Chambers, Everts, Shephard, Mobley); none opposed; no abstentions. Motion carries unanimously 5/0/0.

**5. EXECUTIVE DIRECTOR UPDATE**

Mr. Bondy updated the Board and public on a review by the Department of Water Resources (DWR) of the Mound Basin GSA Basin Boundary Modification. He reported

that DWR is considering adding four small canyons located north of the basin going into the hills, which indicate alluvium (DWR criteria signifying that it may indicate an aquifer). Mr. Bondy reported that he uploaded a memorandum to the DWR site refuting this premise and that the DWR was reviewing the document. He said that DWR may accept or deny his argument, and that either way, it would be a while before the Agency heard back from DWR. Chair Mobley asked some questions about the DWR's assertion, and Mr. Bondy responded that there is no data other than visual and that the DWR's decision should not impact the jurisdictional adjustments to align the basin boundary with the boundaries of the of Santa Paula Basin adjudication or Fox Canyon GMA.

Mr. Bondy reported that the Mound Basin GSA website is up and running. He also reported that he had some inquiries regarding extraction fee invoices. In particular, he said that Duda Farms had contacted him regarding property the company is leasing on Olivas Road. He said the invoices didn't specify if the tenant or the landlord was responsible for the assessment of the GSA. He said he had been working with counsel and that both tenant and landlords could be held responsible and would hopefully work it out, but that he would follow-up with Duda Farms as well as United finance staff to resolve any outstanding issues.

In September, Mr. Bondy said he filed the GSP Initial Notification with DWR. He stated that this was a requirement for proceeding with the grant agreement.

Mr. Bondy provided an update on DWR Technical Support Services funding for the monitoring well. DWR says that in order to proceed, the GSA needs to nail down the location where the well will be drilled, and if the location is at the Olivas Adobe or golf course, the GSA will need to show an official access agreement confirming that the City, GSA and DWR can access the well location. Chair Mobley suggested that Director Brown could be of assistance in locating the spot for the monitoring well, and Director Brown said that so far, so good and that he doesn't anticipate any problems and that the location provides easier access than most.

## **6. DIRECTORS UPDATES**

Director Shephard asked a question about billing, wondering if UWCD had indicated if it was billing the owners or the lease and whether the APN is listed on the invoice. Mr. Bondy said that he believed it was standard practice to bill the property owners unless there were specific instructions to bill tenants. Chair Mobley said he believed the property owner was responsible for the assessment. Mr. Bondy said that the water code is different, and that UWCD billed tenants at the request of the property owner as a courtesy. SGMA doesn't specify property owner or lease and the Board may want to consider adopting specific language regarding who is responsible for Agency's assessment and that legal counsel had recommended making the land owner responsible for paying the GSA assessment. Director Chambers said that it is basically an extraction fee and that the owner should be billed first and then the lease if the owner objects.

Director Everts reported that he had attended a follow up meeting organized for the various GSAs with climate change scientists that were visiting and making presentations to various groups within the county. He said both the scientists and the participating GSA members had lots of questions and the scientists were very interested in how climate change applies to local issues and situations and were looking to gather as much information as possible.

## **7. CONSENT CALENDAR**

Mr. Bondy said he has asked Erin Gorospe of UWCD to provide background for the Board on the various monthly financial reports included in 7b, so he recommended pulling that from the Consent Calendar for separate discussion. Director Everts said he had to recuse himself from voting on the Minutes as he was not in attendance at the August 16 or August 23 meetings.

### **7a. Approval of MINUTES**

The Board will consider approving the Draft Minutes from the Board of Directors Meeting of August 16, 2018 and the Special Meeting/Public Hearing of August 23, 2018.

### **7c. Invoices for payment approval (outstanding invoices \$42,529.11)**

The Board will consider approving invoices for payment, as follows:

1. insureCAL Insurance Agency (General Liability Policy) \$1,995.24
2. Klein Denatale Goldner Cooper Rosenlieb & Kimball (legal services) \$8,861.57  
(encompasses invoices for legal services for May, June, July, August and September)
3. Bondy Groundwater Consulting (GSP Grant application) \$16,585.61
4. Bondy Groundwater Consulting (GSP \$6,365; Admin \$1,987.21) \$8,352.21  
(encompasses invoices for GSP tasks and GSA administration for July and August)
5. County of Ventura IT Services (Website and hosting) \$1,774.68
6. Michael Mobley (expense reimbursement) \$100.00
7. Bondy Groundwater Consulting (GSP\$3752.50; Admin \$1,151.45) \$4,903.95

Motion to approve the minutes (7a) and invoices for payment (7c), Director Shephard; Second, Director Brown. Voice vote: four ayes (Brown, Chambers, Shephard, Mobley); none opposed; one recused (Everts). Motion carries unanimously 4/0/1.

### **7b. Monthly Financial Reports**

The Board will receive monthly financial reports from UWCD's accounting staff.

Ms. Gorospe walked the Board members through the monthly financial reports. She said that the Profit and Loss report indicated that the groundwater extraction fees for January through June, 2018 had been billed at \$78,815.64. As of September 30, 2018 \$13,416.40 had been received by the GSA. As of September 30, 2018, there were \$40,477.91 in invoices to be paid, some of which related to services provided in FY 17-18. Ms. Gorospe noted that as of the October 16, the GSA had also received an advance from the City of Ventura of \$55,000 and expected to receive an advance from the County of Ventura of

\$50,000 (currently listed amounts were transposed on the Balance Sheet). She asked if the Board had any questions. None were offered.

Motion to receive and file the monthly financial reports, Director Everts; Second, Director Brown. Voice vote: five ayes (Brown, Chambers, Everts, Shephard, Mobley); none opposed; none abstained. Motion carries unanimously 5/0/0.

## 8. ACTION ITEMS

### 8a. Approval of Stakeholder Engagement Plan

#### Motion

Mr. Bondy presented the Stakeholder Engagement Plan to the Board for its consideration. He stated that once the Board had approved the plan, it would be posted on the Mound Basin GSA website for public review. He reminded the Board that SGMA has regulations for how GSAs are to communicate with the public and stakeholders during GSP development and that it is critical that the GSA be transparent in its outreach and engagement. He also stressed the importance of starting up front or early in the process so that the public is involved throughout the development of the GSP. He said the Agency's Stakeholder Engagement Plan was adapted from the Upper Ventura River GSA's plan, which was in turn based on a San Diego County template for several GSAs. Chair Mobley asked that although it was based on the Upper Ventura River GSA the data is reflective of the Mound Basin, and Mr. Bondy replied yes.

Director Chambers asked if the Watershed Coalition had scheduled a meeting for review. Director Shephard said that the Farm Bureau and Watershed Coalition of Ventura County held an event last November and shared perspectives of the GSAs. He also added that Santa Clara River Watershed Coalition's Lynn Rodriguez and Lara Meeker, during a meeting at UWCD, had various councils form and flow through the Coalition which include Calleguas Creek, and address the Santa Clara and Ventura River too. He stated that while the Watershed Coalition was the overarching entity, the Santa Clara River Watershed Coalition was more germane to the Mound Basin. Director Chambers asked if the Clerk of the Board could schedule outreach opportunities with other Boards' meetings. Ms. Sofley replied that she would provide timely calendar updates for appropriate meetings of other agencies.

Chair Mobley asked if there were any questions or comments from the public. None were offered

Motion to approve the proposed Stakeholder Engagement Plan, Director Everts; Second, Director Shephard. Voice vote: five ayes (Brown, Chambers, Everts, Shephard, Mobley); none opposed; none abstained. Motion carries unanimously 5/0/0.

### 8b. Approval of Grant Agreement

#### Motion

Mr. Bondy reported to the Board that after speaking with the Glendale office of DWR, some minor changes were made to the grant scope of work and schedule, which are currently being reviewed by DWR's Sacramento office. Among the changes were the removal of the monitoring well, which DWR was agreeable to, but the Agency will be obligated to install in future. The well remains required, but not within the grant, and the

Agency is encouraged to pursue technical support for help with monitoring well costs. DWR recently determined that GSA formation costs are not eligible as part of the cost share and Mr. Bondy is working with DWR to remedy. The proposed remedy is to reduce the Agency's 50 percent cost share requirement to 25 percent based on disadvantaged communities in the basin. Mr. Bondy worked with the City of Ventura to provide the disadvantaged community documentation which would reduce the Agency's cost share requirement to 25 percent.. This designation as a DAC has been submitted to DWR, but has not been confirmed officially yet. DWR also lumped many of the various tasks into funding categories which simplifies reporting and tracking but may delay some grant payments. As a result, Mr. Bondy negotiated changes to the cost share allocations between budget categories to frontload as much reimbursement as early as possible. The net result is that the Agency can expect reimbursement to begin sooner for grant administration, but will have to wait somewhat longer for reimbursement to begin for GSP development activities. Mr. Bondy asks that the Board authorize the Chair to execute the grant agreement subject to minor changes from DWR.

Motion to approve the DWR Prop 1 Grant Agreement, Director Shephard; Second, Director Chambers. Voice vote: five ayes (Brown, Chambers, Everts, Shephard, Mobley); none opposed; none abstained. Motion carries unanimously 5/0/0.

**8c. Approval of Waiver of Late Fees and Penalties relating to Groundwater Extraction Fees**

**Motion**

UWCD's Erin Gorospe reported that although billing invoices were sent out to owners and operators on September 1, 2018, and were due on October 1, 2018. As of October 9, \$34,758.84 is still outstanding (\$44,056.80 has been received by the GSA). According to Article 10.1(a) of the Agency's bylaws, the Agency can assess a one percent per month interest rate on the unpaid balance as well as a ten percent penalty fee. But because this is the first time owners and operators have received invoices from the Mound Basin GSA, and may not have included funding for the payment of these invoices in their budgets, staff recommended waiving penalties and interest for accounts that are paid before December 31, 2018. The Board, by an affirmative vote of three directors, is authorized to waive interest and penalties on overdue fees. By approving a one-time waiver of Late Fees and Penalties relating to Groundwater Extraction Fees for all customers, the Agency is forgoing up to \$3,475.88 in penalty revenue and up to \$1,042.77 in interest revenue which were not included in the FY 18-19 Budget.

Motion to approve the one-time waiver of late fees and penalties relating to groundwater extractions fees for accounts that are paid before December 31, 2018, Director Chambers; Second, Director Brown. Voice vote: five ayes (Brown, Chambers, Everts, Shephard, Mobley); none opposed; none abstained. Motion carries unanimously 5/0/0.

**8d. FY 2018-19 Budget Amendment**

**Motion**

Ms. Gorospe reported that the Budget adopted at the August 23, 2018 Mound Basin Board meeting showed revenues on a cash basis. The use of accrual basis is required by the Governmental Accounting Standards Board Pronouncement 34 for operations that are



considered to be enterprise funds. One of the criteria for designation as an enterprise fund is that the establishment of fees and charges designed to recover costs, which is the case with the Mound Basin GSA. Fox Canyon Groundwater Management Agency also is considered an enterprise fund and uses the accrual basis of accounting.

Groundwater extraction fee revenue for FY 2018-19 was originally budgeted at \$204,000 (\$74,000 for the period of January to June, 2018 and \$130,000 for July to December 2018). An accrual based-budget would total \$194,750 (\$130,000 for July to December 2018 and as \$64,750 for January to June 2019). Additionally, the adopted budget included revenue of \$105,000 in contributions from member agencies. These contributions are loans and are recorded as liabilities rather than revenue. Staff recommends removing this item from budgeted revenue.

Changing from a cash to accrual-based budget for groundwater extraction fees will have no net effect, as it is simply a timing issue. Reclassifying the contributions from member agencies from revenues to liabilities will decrease budgeted fund balance by \$105,000. There is no cash effect.

Motion to revised the FY 2018-19 budget to account for revenue projections on an accrual basis and adopt the revised FY 2018-19 budget; Director Everts; Second, Director Brown. Voice vote: five ayes (Brown, Chambers, Everts, Shephard, Mobley); none opposed; none abstained. Motion carries unanimously 5/0/0.

## 9. INFORMATION ITEMS

### 9a. GSP Development Options Informational Item

Mr. Bondy led the Directors in a discussion of the various options relating to the development of the Agency's Groundwater Sustainability Plan, which currently includes \$50,000 in in-kind services from UWCD, for technical work on the Basin Boundary Modification, and Chapter 2 basin settings and hydrogeology work. UWCD technical staff expressed a willingness to take a larger role beyond the in-kind services. Given UWCD technical staff's groundwater modeling experience and knowledge of the Basin and cost-effective rates expanding their role in the GSP development has the potential for considerable cost savings to the Agency. After discussions with UWCD staff, it was agreed that Mr. Bondy would serve as the lead on GSP development regarding policy issues such as development of sustainable management criteria. Further discussion with UWCD staff is required to delineate specific tasks assignments and availability. At some point, it may be prudent to contract with an outside consultant for tasks that fall within the gaps between UWCD and Mr. Bondy. Mr. Bondy will come back to the Board with a matrix of tasks and assignments with an eye toward maximizing the most cost effective and efficient means of completing the GSP.

Director Shephard expressed his desire to see Mr. Bondy work with UWCD and Director Brown agreed that UWCD's knowledge and experience in the basin is unsurpassed and encouraged Mr. Bondy to explore options to work together with UWCD on the GSP development. Mr. Maguire also voiced his support of Mr. Bondy and UWCD staff working collaboratively on the development the Mound Basin GSP.

**9b. Ventura's WaterPure Project Presentation**  
**Informational Item**

Director Brown provided presentation concerning Ventura Water's WaterPure project.

The goals of the project are to provide a safe, reliable and adequate water supply to the community while also providing ecologically protective solutions for wastewater and minimizing rate payer impacts. The existing water/wastewater systems have challenges, including the water supply, the quality of groundwater, increasing supply costs, and competing interests to protect endangered species affected by discharges to the Santa Clara River Estuary.

Potable reuse fits in by providing needed supply augmentation, even during drought; improving supply reliability and supply water quality and complies with consent decree and NPDES requirements for protecting the health of the estuary.

The City is studying various future water supply is augmentation options, including potable reuse (the number one priority), which can also benefit groundwater desalting (priority number 2) and seawater desalination (priority number 3) in addition to groundwater and surface water supplies. Ventura Water began efforts for a desalination plant in 1994, but when heavy rains came, the public lost interest as there was more than enough water until 2014. In 2016, Ventura Water received a grant to build a DPR demonstration facility which employed sand filters, pasteurization, membrane ultrafiltration, reverse osmosis and ultraviolet light for advance oxidation. The facility was used to demonstrate the safety of the supply, conduct surveys about the public's willingness to consider potable reuse as a supply, and educate the public. . The City earned strong support for adding DPR water to Ventura's drinking water supply (if it was treated to the same quality or higher as regular tap water).

Director Brown reported that the City is looking at multiple sites around Ventura and that the Environmental Impact Report (EIR) is coming out in November and the NPDES Permit is expected by the end of the year. .

Chair Mobley asked what percentage of the water goes back to the estuary. Mr. Brown replied that scientific review panel and regulators don't want all the water removed from the estuary and a percentage will still go to the estuary. The City will have its own brine disposal line or will connect to an existing brine disposal line. Director Shephard asked about eventually transferring the from indirect to indirect potable reuse and Mr. Brown said that there would have to be a technology buffer. Director Everts said it's important to understand the challenges of DPR and engage the public with a suite of programs that explain and clarify the processes and technologies. Director Brown agreed.

**10. FUTURE AGENDA ITEMS**

None were offered

**ADJOURNED 2:48p.m.**

Mound Basin GSA Board of Directors Meeting

MINUTES

October 18, 2018

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The Board adjourned at 2:48 p.m. to the next **Regular Board Meeting** on Thursday, **November 15, 2018** or call of the Chair.

I certify that the above is a true and correct copy of the minutes of the Mound Basin Groundwater Sustainability Agency's Board of Directors meeting of [date].

ATTEST: \_\_\_\_\_  
Kevin Brown, Board Secretary

ATTEST: \_\_\_\_\_  
Kris Sofley, Clerk of the Board



MOUND BASIN GSA BOARD OF DIRECTORS MEETING  
October 18, 2018

Name: Den Detmer

Organization: United

Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Name: NEAL MAGUIRE

Organization: MBWG

Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Name: \_\_\_\_\_

Organization: \_\_\_\_\_

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Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Name: Burt Haney

Organization: \_\_\_\_\_

Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Name: \_\_\_\_\_

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**MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY**  
**FISCAL YEAR BUDGET**  
 July 1, 2018 - June 30, 2019  
 Draft Proposed Budget (8/23/18)

**REVENUES**

ACCOUNT NUMBER	REVENUES	BUDGET 2018/2019	Comments
1	Contributions from Member Agencies	\$105,000	\$50k from the City, \$50k from the County, both are loans
2	Revenue from Groundwater Extraction Fee	\$204,000	Twice per year billing.
4	Reimbursement from DWR Grant	\$6,540	Estimated based on GSP tanks for FY 18-19, depends on cost-share spent by Agency.
<b>TOTAL REVENUES</b>			<b>\$318,540</b>

**OPERATING EXPENSES**

ACCOUNT NUMBER	OPERATING EXPENSE	BUDGET 2018/2019	Comments
<b>Administrative Costs</b>			
1	Executive Director/Project Manager	\$60,000	
2	Clerk of the Board	\$20,000	Provided by United Water Conservation District via contract
3	Accounting Services	\$10,000	Provided by United Water Conservation District via contract
<b>Total Administrative Cost:</b>		<b>\$90,000</b>	
<b>Professional Services:</b>			
4	Website Development	\$2,000	County of Ventura Information Technology Services
5	Website maintenance	\$400	County of Ventura Information Technology Services
6	Audits	\$7,000	Estimate
7	Public Outreach/218 publications	\$1,500	Estimate
8	Liability Insurance	\$1,955	Estimate
9	Routine Legal Counsel	\$32,400	10hrs per month for July 2018 - June 2019
10	Special Legal Services	10,000	
11	Annual Report	500	
12	DWR filing fees/etc	\$60	
<b>Total Professional Services Cost:</b>		<b>\$66,746</b>	
<b>GSP Activities:</b>			
13	Water Quality and Isotope Study	\$45,330	
14	Basin Boundary Modification	\$5,000	Cost assumes \$5,000 of UWCD in-kind labor.
15	Organizational Activities	\$11,900	
16	GSP Chapter 2: Plan Area and Basin Setting	\$50,200	Cost assumes \$22,500 of UWCD in-kind labor.
17	Project Administration (Grant Management)	\$0	Costs are included in administration.
18	Funding for Reserves	\$25,000	
<b>Total GSP Activities:</b>		<b>\$138,430</b>	
<b>TOTAL EXPENSES</b>		<b>\$228,430</b>	
<b>Expenses deferred from FY2017-18</b>		<b>\$32,962</b>	
<b>TOTAL REVENUES EXCEEDING EXPENSES</b>		<b>\$9,383</b>	

10/18/2018

**MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY**  
**FISCAL YEAR BUDGET**  
 July 1, 2018 - June 30, 2019  
 Proposed Revised Budget (10/15/18)

**REVENUES**

ACCOUNT NUMBER	REVENUES	BUDGET 2019/2019	Comments
2	Revenue from Groundwater Extraction Fee	\$187,500	Twice per year billing.
4	Reimbursement from DWR Grant	\$5,540	Estimated based on GSP tanks for FY 18-19, depends on cost-share spent by Agency.
<b>TOTAL REVENUES</b>			<b>\$193,040</b>

**OPERATING EXPENSES**


ACCOUNT NUMBER	OPERATING EXPENSE	BUDGET 2019/2019	Comments
<b>Administrative Costs</b>			
1	Executive Director/Project Manager	\$60,000	
2	Clerk of the Board	20,000	Provided by United Water Conservation District via contract
3	Accounting Services	10,000	Provided by United Water Conservation District via contract
<b>Total Administrative Cost:</b>		<b>\$90,000</b>	
<b>Professional Services:</b>			
4	Website Development	2,000	County of Ventura Information Technology Services
5	Website maintenance	400	County of Ventura Information Technology Services
6	Audits	7,000	Estimate
7	Public Outreach/218 publications	1,500	Estimate
8	Liability Insurance	1,955	Estimate
9	Routine Legal Counsel	\$32,400	\$270/hr - Agenda review and attend meetings as necessary - 10hrs per month for July 2018 - June 2019
10	Special Legal Services	10,000	
11	Annual Report	500	
12	DWR filing fees/etc	60	
<b>Total Professional Services Cost:</b>		<b>\$67,660</b>	
<b>GSP Activities:</b>			
13	Water Quality and Isotope Study	45,330	
14	Basin Boundary Modification	5,000	Cost assumes \$5,000 of UWCD in-kind labor.
15	Organizational Activities	11,900	
16	GSP Chapter 2: Plan Area and Basin Setting	52,200	Cost assumes \$22,500 of UWCD in-kind labor.
17	Project Administration (Grant Management)	\$0	Costs are included in administration.
<b>Total GSP Activities:</b>		<b>\$114,430</b>	
<b>TOTAL EXPENSES</b>		<b>\$204,430</b>	
<b>TOTAL REVENUES EXCEEDING EXPENSES</b>		<b>\$ (11,390)</b>	

**PROJECTED FUND BALANCE**

Beginning Working Capital/Fund Balance July 1, 2018	\$ 57,850.00
Net Surplus (Shortfall)	(46,895.00)
Cash Advances*	105,000.00
Projected Ending Working Capital/Fund Balance, June 30, 2019	115,955.00
Designated for Reserves	25,000.00
Net Available	\$ 90,955.00

\* Net shortfall of \$46,895.00 to be funded by expected cash advances from the City of San Buenaventura and Ventura County Watershed Protection District, totaling \$105,000.  
 The proposed repayment dates of the cash advances are December 31, 2021 for the City of San Buenaventura and December 31, 2022 for the Ventura County Watershed Protection District.


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# Ventura Water's path to DPR in California

CASA Conference  
August 2018






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**VenturaWaterPure**  
*The Basics*

- City of San Buenaventura (Ventura)
- Need for project
  - Legal challenges to NPDES permit and Santa Clara river estuary
  - Consent Decree
  - SGMA
  - Water supply augmentation and reliability
  - Beneficial reuse of VWRF effluent
  - Improvement of water quality
- Why DPR?
  - No availability of long term storage
  - Proven technology
  - More cost effective compared to IPR
  - SGMA - Other users on groundwater basins, loss of return

2



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**5 January 1969**

**VENTURA'S WATER HOPES**  
**Changing It From Sewage To Pure**

Ventura's sanitation department is working with DuPont Corporation on a system which will produce better drinking water than the city's present water supply.

Dave Sullivan, city sanitation superintendent, gave a demonstration. He poured a vial of treated water from a complicated looking "reverse osmosis unit." He then raised the vial, as if in a toasting ceremony, and drank the contents.

Asked where the water originally came from, Sullivan replied:

"Sewage."

The reverse osmosis unit, developed by Sullivan's department in cooperation with DuPont, has proved successful in producing pure water, he said. Now it must be determined if it can be done economically.

The system—the only one of its kind in the United States—has been undergoing tests since September, Sullivan said.

Its major working parts consist of a purification pipe which can withstand 3,000 pounds of pressure per square inch, and a filament of hollow nylon fibers about the size of sewing thread.

The system, which Sullivan said is much less complicated than others previously tested, basically works as follows:

Water is forced at tremendous pressure through the pipe, which is known as a permeator. The hollow nylon fibers, tightly snuggled together, are so microscopic that the water must break into microscopic molecules to be able to get through.

Minerals, germs and other unwanted intruders are too large to get through—and they don't.

It's as simple as that. Well, almost.

"We've already proved that it works," Sullivan said. "Economy is the main thing that must be determined."

The system being tested produces 2,000 gallons of pure water every day. The city uses about 10 million gallons of water each day, Sullivan said.

Therein lies the problem.

He estimated that to build a full size system which would treat 5 million gallons per day, it would cost about \$5 million. He thinks it can be done for less, and predicts that within five years much of Ventura will be using reclaimed water, which he contends is better than what residents are getting now.

"We can produce better quality water here than any existent water supply in Ventura County," he said.

"People say, 'if you think I'm going to drink that stuff you're out of your head.'"


"But it's done every day," he added, noting that drinking water comes from rivers and lakes—treated by nature, after once having been used by man.

**MAKING WATER PURE** — Ventura Sanitation Superintendent Dave Sullivan tests water from a "reverse osmosis unit" which can make sewer water pure enough to drink.

**VENTURA COUNTY**  
**Star-Free Press**  
**COUNTY SCENE**

B-4 Sunday, January 5, 1969

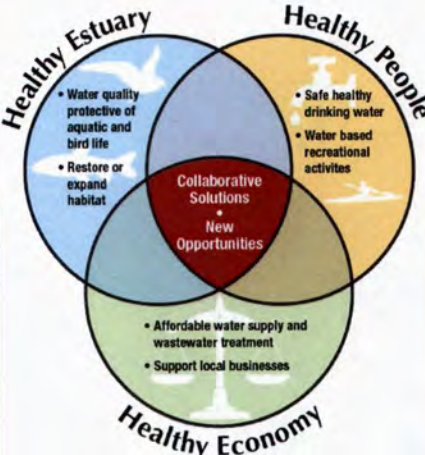
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**Ventura Water is dedicated to providing our community with high quality service**

**Goals include:**

- Providing a safe, reliable and adequate water supply
- Providing ecologically protective solutions for wastewater
- Minimizing rate payer impacts



**Healthy Estuary**

- Water quality protective of aquatic and bird life
- Restore or expand habitat

**Healthy People**

- Safe healthy drinking water
- Water based recreational activities


**Healthy Economy**

- Affordable water supply and wastewater treatment
- Support local businesses

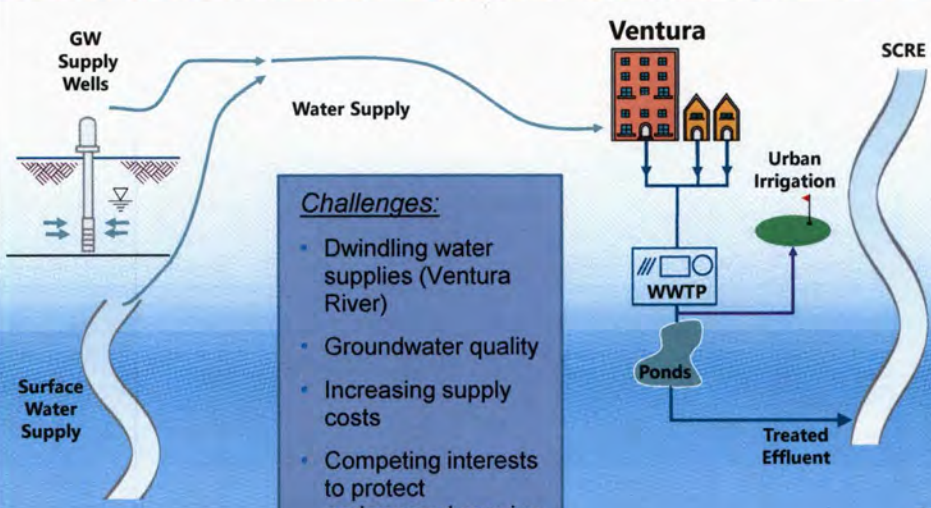
**Collaborative Solutions + New Opportunities**

3

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**Existing Water/WW Systems Have Challenges**




**Challenges:**

- Dwindling water supplies (Ventura River)
- Groundwater quality
- Increasing supply costs
- Competing interests to protect endangered species

4





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## Discharge to the Santa Clara River Estuary

- Federally listed habitat for endangered species
- NPDES and Consent Decree requirements to determine best use and volume of the treated water resources from the VWRP that are needed to protect the health of the estuary







Steelhead



Tidewater goby




California least tern









Western snowy plover


5

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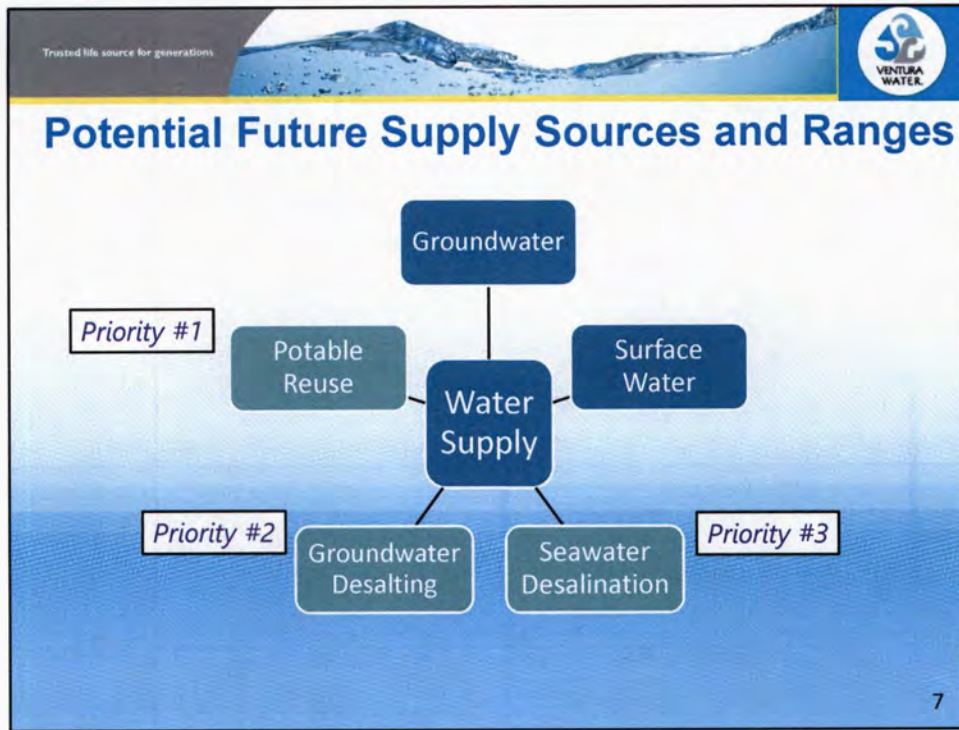
## Recycled Water Market Study

<p>Urban Irrigation </p> <p>Ag irrigation </p> <p>United Water Percolation </p>	  	<p>Low demand, extensive purple pipe. Seasonal use with little supply benefit</p> <p>Seasonal demand with little supply benefit. Requires partial RO for chloride removal</p> <p>Low demand unless partial RO is provided Not full supply benefit unless only for City Users</p>
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 **Potable Reuse "Fit":**

- Provide needed supply augmentation, even during drought
- Improve supply reliability and supply water quality
- Complies with consent decree and NPDES requirements

6




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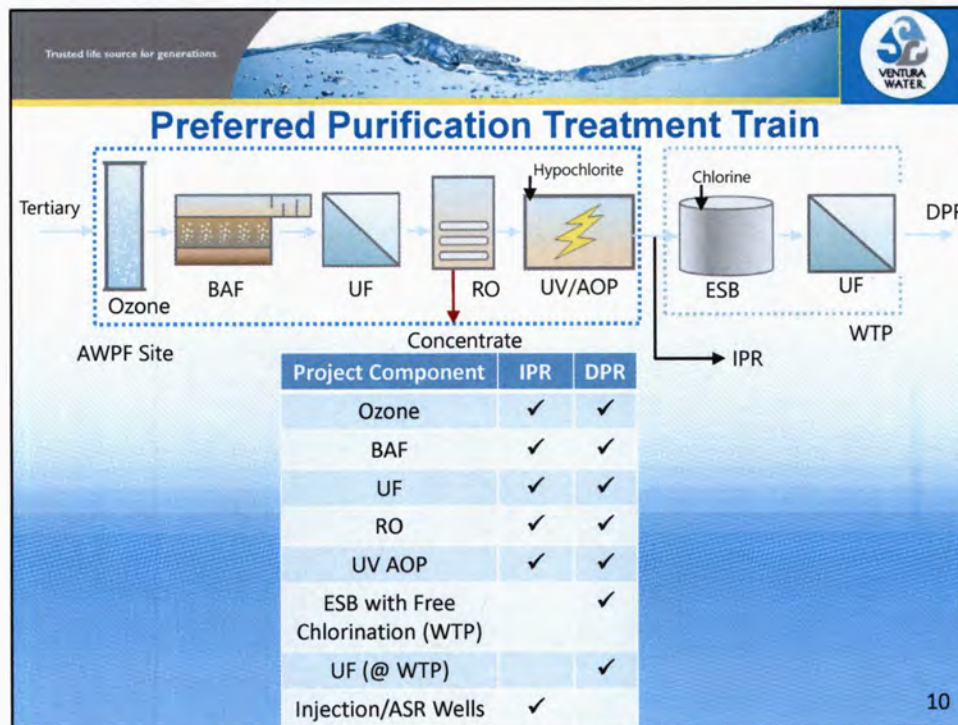
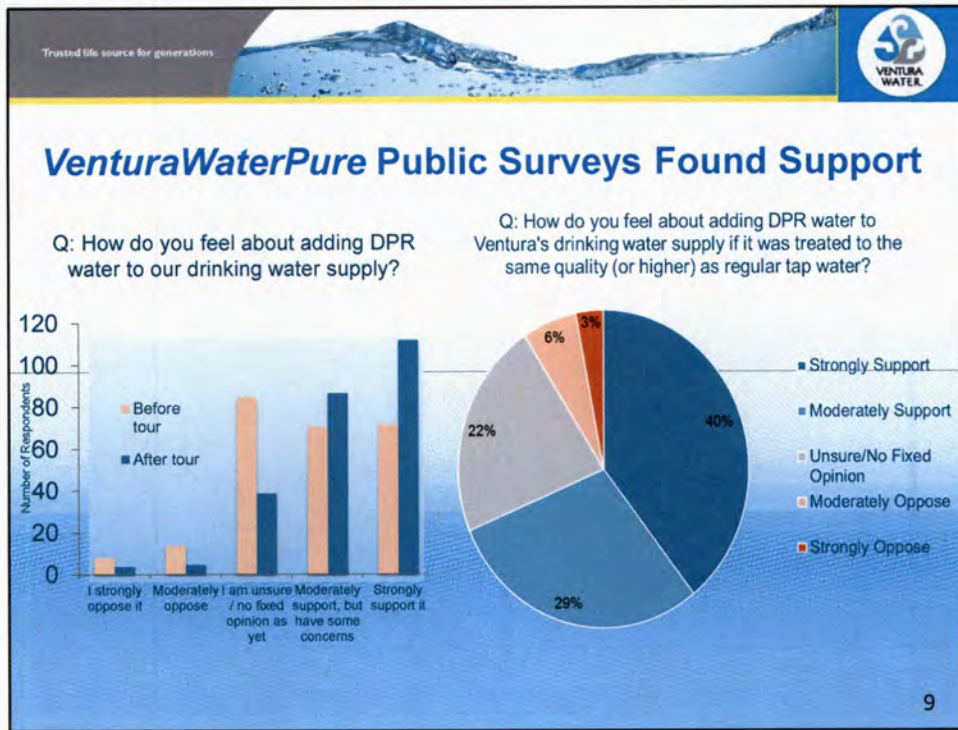
## VenturaWaterPure Demonstration Facility Provided Opportunities to:

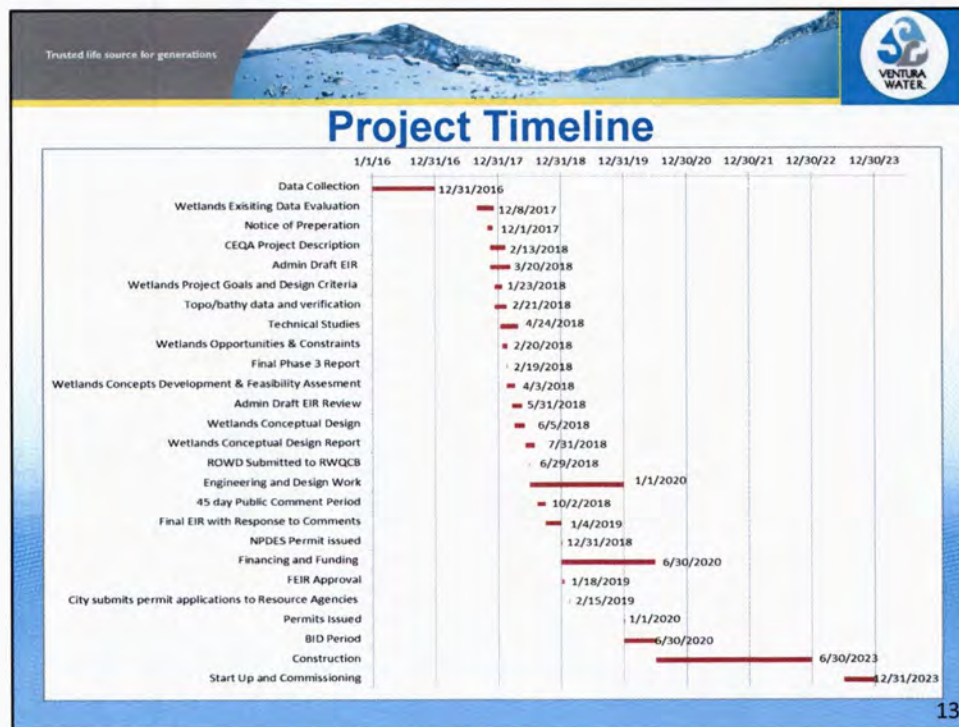
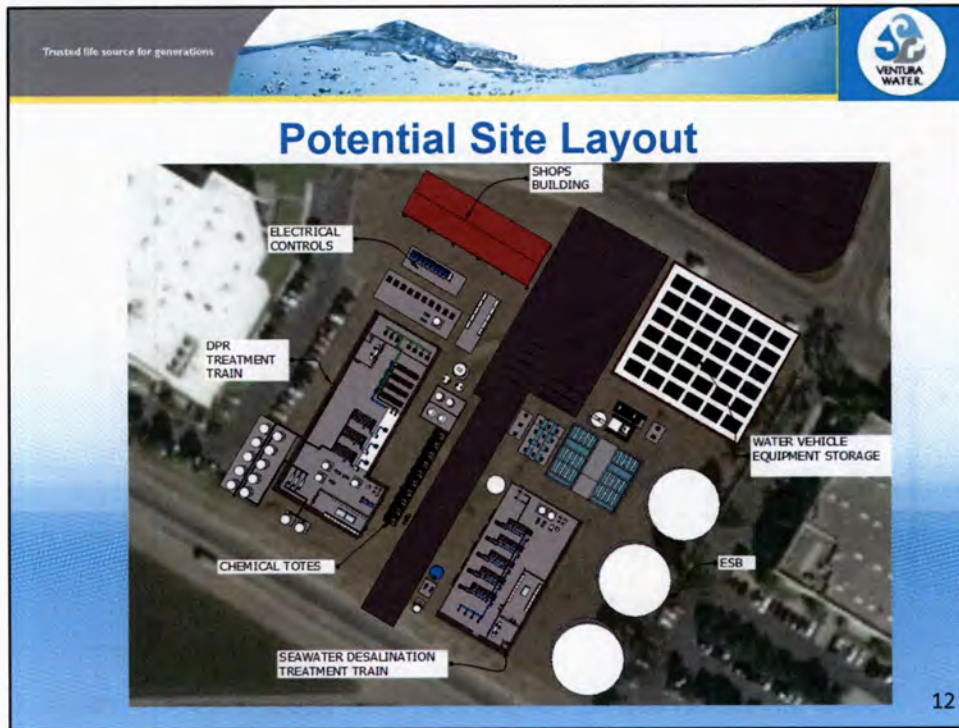
- Visit state-of-the-art purification facility
- Learn about the water cycle/how reuse fits in
- Answer questions about technologies, potable reuse and where else it is being applied
- Demonstrate the safety of the supply
- Conduct surveys about willingness to consider potable reuse as a supply




1. Existing Sand Filters
2. Pasteurization
3. Membrane Ultrafiltration
4. Reverse Osmosis
5. Ultraviolet Light/Advanced Oxidation

EXISTING 8






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## Ventura's Participation in R&D Efforts to Support Confidence in DPR

- WRF 4536 – Demonstration and Blending Studies
- WRF 17-30 - Real Time Monitoring of Raw Wastewater
- Pathogen Sampling and Risk-Based Engineering Analysis to Set Treatment Train and Engineered Storage Buffer (QMRA – WRF 14-16)

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Questions?



**MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY**

**Item No. 5(b)**

**DATE:** January 10, 2019  
**TO:** Board of Directors and Executive Director  
**FROM:** Erin Gorospe, UWCD  
**SUBJECT:** Approval of Warrants

**SUMMARY**

The Board will review and consider approving payment of outstanding vendor invoices.

**RECOMMENDED ACTION**

The Board will consider approval of invoices to pay at this time and which, if any, will be held over for payment at a later date.

**BACKGROUND**

The Mound Basin GSA has \$15,362.81 in outstanding invoices. The Board will consider approving invoices for payment, as follows:

1. Klein Denatale Goldner Cooper Rosenlieb & Kimball (legal services) \$1,434.00 (for legal services through October 18, 2018)
2. Bondy Groundwater Consulting (GSP Tasks \$3,752.50; Ex Dir Duties \$2,422.50; Reimbursable Expense \$1.64) \$6176.64 (for October)
3. Bondy Groundwater Consulting (GSP \$1,805; Ex Dir Duties \$332.50; Reimbursable Expense \$10.90) \$2,148.40 (for November)
4. Bondy Groundwater Consulting (GSP Tasks \$807.50; Ex Dir Duties \$1,140; Reimbursable Expense \$10.90) \$1,958.40 (for December)
5. UWCD (Clerk of the Board \$2,339.14; Accounting \$528.98; Legal notices, mileage and supplies \$561.25) \$3,429.37 (for July through September)
6. Klein Denatale Goldner Cooper Rosenlieb & Kimball (legal services) \$216.00 (for legal services through December 19, 2018).

There is currently a balance of \$87,629.25 in the Agency’s checking account. Accounting staff is asking for Board’s direction regarding which invoices to pay and which, if any, to hold over for payment at a later date.

**FISCAL SUMMARY**

The fiscal impact is a cash outflow of up to \$15,362.81. If all invoices are paid, the Bank of the Sierra checking account will have a balance of \$72,266.44.

**ATTACHMENTS**

A. Check Detail Report

Action: \_\_\_\_\_

Motion: \_\_\_\_\_ 2<sup>nd</sup>: \_\_\_\_\_

K. Brown \_\_\_ J. Chambers \_\_\_ C. Everts \_\_\_ M. Mobley \_\_\_ G. Shephard \_\_\_

Mound Basin Groundwater Sustainability Agency

Check Detail

January 11, 2019

<u>Num</u>	<u>Date</u>	<u>Name</u>	<u>Amount</u>
11258	01/11/2019	United Water Conservation District	-3,429.37
11259	01/11/2019	A.J. Klein, Inc T. Denatale, B. Goldner	-1,434.00
11260	01/11/2019	Bondy Groundwater Consulting, Inc	-6,176.64
11261	01/11/2019	A.J. Klein, Inc T. Denatale, B. Goldner	-216.00
11262	01/11/2019	Bondy Groundwater Consulting, Inc	-2,148.40
11263	01/11/2019	Bondy Groundwater Consulting, Inc	-1,958.40
<b>TOTAL</b>			<b>-15,362.81</b>

**MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY**

**Item No. 5(c)**

**DATE:** January 11, 2019  
**TO:** Board of Directors and Executive Director  
**FROM:** Erin Gorospe, UWCD  
**SUBJECT:** Monthly Financial Reports

**SUMMARY**

The Board will receive the monthly financial reports for the Mound Basin GSA.

**INFORMATIONAL ITEM**

UWCD accounting staff has prepared financial reports based on the Mound Basin GSA revenue and expenses for the month of December 2018.

**BACKGROUND**

**FISCAL SUMMARY**

Not applicable.

**ATTACHMENTS**

- A. December 2018 Profit/Loss Statement
- B. December 2018 Balance Sheet



**Mound Basin Groundwater Sustainability Agency**  
**Profit and Loss Budget Performance**  
July through December 2018

	<u>Jul - Dec 18</u>	<u>Annual Budget</u>	<u>% of Budget</u>
<b>Income</b>			
40001 · Groundwater Extraction Fees	0.00	204,000.00	0.0%
41000 · Grant revenue			
41001 · State Grants	0.00	9,540.00	
<b>Total 41000 · Grant revenue</b>	<u>0.00</u>	<u>9,540.00</u>	
<b>Total Income</b>	<u>0.00</u>	<u>213,540.00</u>	<u>0.0%</u>
<b>Gross Profit</b>	0.00	213,540.00	0.0%
<b>Expense</b>			
52200 · Professional Services			
52240 · Prof Svcs - IT Consulting	1,774.68	2,400.00	73.95%
52250 · Prof Svcs - Groundwater/GSP Pre		114,430.00	
52252 · Prof Svcs - GSP Consultant	16,482.50		
<b>Total 52250 · Prof Svcs - Groundwater/GSP Pre</b>	<u>16,482.50</u>	<u>114,430.00</u>	<u>14.4%</u>
52270 · Prof Svcs - Accounting	528.98	17,000.00	3.11%
52275 · Prof Svcs - Admin/Clerk of Bd	2,339.14	20,000.00	11.7%
52280 · Prof Svcs - Executive Director	7,057.10	50,000.00	14.11%
<b>Total 52200 · Professional Services</b>	<u>28,182.40</u>	<u>203,830.00</u>	<u>13.83%</u>
52500 · Legal Fees			
52501 · Legal Counsel	6,132.33	42,400.00	14.46%
<b>Total 52500 · Legal Fees</b>	<u>6,132.33</u>	<u>42,400.00</u>	<u>14.46%</u>
53000 · Office Expenses			
53010 · Public Information	463.84	1,500.00	30.92%
53020 · Office Supplies	2.37	1,000.00	0.24%
53026 · Postage & Mailing	23.97		
53070 · Licenses, Permits & Fees	0.00	500.00	0.0%
53110 · Travel & Training	71.07		
<b>Total 53000 · Office Expenses</b>	<u>561.25</u>	<u>3,000.00</u>	<u>18.71%</u>
53500 · Insurance			
53510 · Liability Insurance	1,955.24	1,955.00	100.01%
<b>Total 53500 · Insurance</b>	<u>1,955.24</u>	<u>1,955.00</u>	<u>100.01%</u>
<b>Total Expense</b>	<u>36,831.22</u>	<u>251,185.00</u>	<u>14.66%</u>
<b>Net Income</b>	<u><u>-36,831.22</u></u>	<u><u>-37,645.00</u></u>	<u><u>97.84%</u></u>

# Mound Basin Groundwater Sustainability Agency

## Balance Sheet

As of December 31, 2018

Dec 31, 2018

### ASSETS

#### Current Assets

##### Checking/Savings

10000 · Bank of the Sierra 70,309.25

Total Checking/Savings 70,309.25

##### Accounts Receivable

11000 · Accounts Receivable 71,073.24

Total Accounts Receivable 71,073.24

Total Current Assets 141,382.49

**TOTAL ASSETS 141,382.49**

### LIABILITIES & EQUITY

#### Liabilities

##### Current Liabilities

##### Accounts Payable

20000 · Accounts Payable 15,362.81

Total Accounts Payable 15,362.81

##### Other Current Liabilities

20001 · Advance from City of Ventura 55,000.00

20002 · Advance from County of Ventura 50,000.00

Total Other Current Liabilities 105,000.00

Total Current Liabilities 120,362.81

Total Liabilities 120,362.81

#### Equity

32000 · Retained Earnings 57,850.90

Net Income -36,831.22

Total Equity 21,019.68

**TOTAL LIABILITIES & EQUITY 141,382.49**

**MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY**

**Item No. 5(d)**

**DATE:** January 17, 2019  
**TO:** Board of Directors and Executive Director  
**FROM:** Kris Sofley, Clerk of the Board  
**SUBJECT:** Board Meeting Dates for 2019

**SUMMARY**

The Board will consider establishing a consistent date and time for its Regular Board Meetings throughout the 2019 calendar year.

**RECOMMENDED ACTION**

In keeping with the Mound Basin’s previously adopted Board of Directors meetings’ schedule of the third Thursday of every month (January through December) in 2019 (see Attachment A), the Board of Directors may continue to build on the public’s expectation, education and engagement, and potentially increase participation at its meetings, by reaffirming its consistent meeting schedule. Staff has confirmed the availability and reserved the City of Ventura’s Santa Cruz Conference Room (Room No. 223) at City Hall on these dates, from 1pm to 3pm. It is staff’s recommendation that the Board approve the third Thursday of the month as the Board’s regularly scheduled Board of Director Meeting date, beginning at 1p.m.

**BACKGROUND**

The Mound Basin GSA Board of Directors initially selected the third Thursday of the month as the date of its regular monthly Board of Directors meeting. By maintaining this consistent meeting schedule, the Board reinforces the public’s expectation for the Mound Basin GSA Board meetings to occur at a specific time each month, which provides for greater predictability and engagement from the public.

**FISCAL IMPACT**

There is no fiscal impact to this motion.

**Attachments:** A – Calendar for 2019

Proposed Motion: “Motion to adopt the third Thursday of the month as the date for the Mound Basin GSA Board of Directors’ regular Board meetings with a starting time of 1p.m. at the City of Santa Buenaventura City Hall’s Santa Cruz conference room (Room No. 223).”

1<sup>st</sup>: Director \_\_\_\_\_ 2<sup>nd</sup>: Director \_\_\_\_\_

Voice/Roll call vote: Director Brown:                      Director Chambers:  
Director Everts:                                      Director Mobley:                      Director Shephard:

# Calendar for Year 2019 (United States)

<p><b>January</b></p> <table border="1"> <tr><th>Su</th><th>Mo</th><th>Tu</th><th>We</th><th>Th</th><th>Fr</th><th>Sa</th></tr> <tr><td></td><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr> <tr><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td></tr> <tr><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td></td><td></td></tr> <tr><td colspan="7">5:● 14:○ 21:○ 27:○</td></tr> </table>	Su	Mo	Tu	We	Th	Fr	Sa			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			5:● 14:○ 21:○ 27:○							<p><b>February</b></p> <table border="1"> <tr><th>Su</th><th>Mo</th><th>Tu</th><th>We</th><th>Th</th><th>Fr</th><th>Sa</th></tr> <tr><td></td><td></td><td></td><td></td><td></td><td>1</td><td>2</td></tr> <tr><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></tr> <tr><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td></tr> <tr><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td></td><td></td></tr> <tr><td colspan="7">4:● 12:○ 19:○ 26:○</td></tr> </table>	Su	Mo	Tu	We	Th	Fr	Sa						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			4:● 12:○ 19:○ 26:○							<p><b>March</b></p> <table border="1"> <tr><th>Su</th><th>Mo</th><th>Tu</th><th>We</th><th>Th</th><th>Fr</th><th>Sa</th></tr> <tr><td></td><td></td><td></td><td></td><td></td><td>1</td><td>2</td></tr> <tr><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></tr> <tr><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td></tr> <tr><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td colspan="7">6:● 14:○ 20:○ 28:○</td></tr> </table>	Su	Mo	Tu	We	Th	Fr	Sa						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31							6:● 14:○ 20:○ 28:○						
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## Holidays and Observances:

<b>Jan 1</b> New Year's Day	<b>May 5</b> Cinco de Mayo	<b>Oct 31</b> Halloween
<b>Jan 21</b> Martin Luther King Jr. Day	<b>May 12</b> Mother's Day	<b>Nov 11</b> Veterans Day
<b>Feb 14</b> Valentine's Day	<b>May 27</b> Memorial Day	<b>Nov 28</b> Thanksgiving Day
<b>Feb 18</b> Presidents' Day (Most regions)	<b>Jun 16</b> Father's Day	<b>Nov 29</b> Black Friday
<b>Mar 17</b> St. Patrick's Day	<b>Jul 4</b> Independence Day	<b>Dec 24</b> Christmas Eve
<b>Apr 15</b> Tax Day	<b>Sep 2</b> Labor Day	<b>Dec 25</b> Christmas Day
<b>Apr 21</b> Easter Sunday	<b>Oct 14</b> Columbus Day (Most regions)	<b>Dec 31</b> New Year's Eve

# MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY

## Item No. 8(a)

**DATE:** January 17, 2019  
**TO:** Board of Directors  
**FROM:** Executive Director  
**SUBJECT:** Agency Officer Appointments and Required Bond

### **SUMMARY**

The Board will consider appointing a chair, vice chair/secretary, and a treasurer to serve during calendar year 2019. The Board also will provide direction concerning obtaining a bond for the Treasurer.

### **RECOMMENDED ACTION**

It is recommended that the Board appoint a chair, vice chair/secretary, and a treasurer to serve during calendar year 2019. It is further recommended that the Board set a bond amount for the Treasurer pursuant to Government Code section 6505.1 and direct the Treasurer to post a bond in that amount.

### **BACKGROUND**

Pursuant to Joint Exercise of Powers Agreement (JPA) Article 7, the Board of Directors shall select officers annually at the first Board meeting following January 1<sup>st</sup> of each year. Officers may serve for multiple consecutive terms, with no term limit.

The 2018 Officers were as follows:

- Chair: Mike Mobley
- Vice Chair/Secretary: Kevin Brown
- Treasurer: Glenn Shephard

Government Code section 6505.1, the JPA agreement §13.3, and the GSA Bylaws § 4.4 require the Treasurer to post a bond as determined by the GSA. First, the Board must determine a bond amount for the Treasurer to post. Next, the GSA will contact a bonding company to request a public official bond in that amount. Once the GSA has a quote for a bond, the GSA, on the Treasurer's behalf, will need to pay the bond premium.

### **FISCAL SUMMARY**

The premium amount of the bond. Based on staff discussion with a broker, bond fees are expected to be approximately 1% of the bond amount.

Staff Report for Motion Item 8(a)

January 17, 2019

Page 2

Action: \_\_\_\_\_

Motion: \_\_\_\_\_ 2<sup>nd</sup>: \_\_\_\_\_

K. Brown \_\_\_ J. Chambers \_\_\_ C. Everts \_\_\_ M. Mobley \_\_\_ G. Shephard \_\_\_

## MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY

### Item No. 8(b)

**DATE:** January 17, 2019  
**TO:** Board of Directors  
**FROM:** Executive Director  
**SUBJECT:** Groundwater Extraction Fee Payment Update

#### **SUMMARY**

Invoicing for thirty-two wells for the 2018-1 semi-annual period (Jan-June 2018) was performed on September 1, 2018. The MBGSA invoices were sent to the well owner or operator (tenant) based on who paid the 2018-1 UWCD extraction fee. Payment to MBGSA was due October 1, 2018.

To date, payments have been received for 26 of 32 wells. A total of \$3,753.24 remains unpaid out of the total of \$78,815.64 invoiced (5% unpaid). 2018-1 non-payment breaks down as follows:

- Non-reporters (4 / 32): Well owners/operators who have failed to report groundwater extractions to UWCD. UWCD staff is working with UWCD counsel to address non-reporting. MBGSA will standby pending resolution of non-reporting by UWCD and take appropriate steps once resolved.
- Unpaid - Owners (2 / 32): Well owners who have paid UWCD's extraction fee for 2018-1, but have not paid the MBGSA 2018-1 extraction fee. Total due is \$3753.20. In early December 2018, the invoices were resent to the well owner with a past due notice and information concerning the penalty waiver through December 31, 2018.
- Unpaid - Operators (0 / 32): All well operators (tenants) who paid UWCD's extraction fee for 2018-1 have also paid the MBGSA 2018-1 extraction fee. Several payments were late, but within the grace period authorized by the Board.

Staff will continue to follow-up on unpaid invoices. Per prior Board action, staff will assess the late fee and penalty on any invoices that were not paid by December 31, 2018.

The 2018-2 (July-Dec 2018) groundwater extraction fee invoices are scheduled to be delivered during the first quarter of 2019 following receipt of the UWCD extraction statements. Pursuant to Resolution 2018-04, the extraction fee for the 2018-2 period will be \$40 per acre foot. Staff intends to continue the practice of sending the invoice to the entity that paid the most recent UWCD extraction fee (i.e. owner vs operator [tenant]), unless a different arrangement is requested by a well owner.

**RECOMMENDED ACTION**

It is recommended that the Board receive an update from staff concerning the 2018-1 groundwater extraction fee payments and consider providing direction to staff concerning the 2018-2 extraction fee invoicing.

**BACKGROUND**

None.

**FISCAL SUMMARY**

None.

Action: \_\_\_\_\_

Motion: \_\_\_\_\_ 2<sup>nd</sup>: \_\_\_\_\_

K. Brown \_\_\_ J. Chambers \_\_\_ C. Everts \_\_\_ M. Mobley \_\_\_ G. Shephard \_\_\_



## **MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY**

### **Item No. 8(c)**

**DATE:** January 17, 2019  
**TO:** Board of Directors  
**FROM:** Executive Director  
**SUBJECT:** GSP Development Options (Grant Category (c): Planning Activities; Task 2: Organizational Activities)

### **SUMMARY**

The Executive Director has been working with UWCD staff to define the nature of its potential role in GSP development. Table 1 (attached) summarizes the proposed GSP preparation roles. The roles can be broken down as follows:

- Technical-Focused GSP Aspects: UWCD staff is comfortable taking a lead role on the primary technical portions of the GSP. The Executive Director would serve as a reviewer. It is also proposed that a consultant would provide as-needed support to UWCD and the Executive Director.
- Policy-Focused GSP Aspects: UWCD staff is not comfortable working in a lead capacity on policy aspects. Instead, the Executive Director could serve as lead for aspects such as sustainable management criteria and projects and management actions. UWCD would provide review and support to the Executive Director. It is also proposed that a consultant would provide as-needed support to the Executive Director and UWCD.
- Background sections (GSP Sections 1 and 2.1): Ideally, background sections would be prepared by a non-technical writer (e.g. Lorraine Walter, if available) to help reduce GSP preparation costs. The Executive Director and UWCD would serve as reviewers and provide support to the non-technical writer.
- GSP Document Management: Document management includes editing, formatting, comment management, and version control. It is proposed that a consultant perform document management. The Executive Director and UWCD would provide support to the consultant.

The Executive Director and UWCD staff have collaborated on developing a scope of work and fee estimate for UWCD's proposed services, which are presented as Tables 2 and 3, respectively (please note that Tables 2 and 3 are subject to change based on final review by UWCD's General Manager). The Executive Director believes UWCD's estimated hours and fees are reasonable and recommends that the Board direct staff to pursue an agreement with UWCD for Board approval.

The Executive Director also recommends entering into a contract with a consulting firm to provide the as-needed support described above. The ideal consulting firm would be willing and able to provide the following support:

1. Low cost staff to support development of GSP background sections in the event that Lorraine Walter has limited availability;
2. Cost-effective support for other GSP elements that are not addressed by UWCD or the Executive Director, as needed; and
3. GSP document management.

In order to minimize costs, the recommended contracting approach would be for the consultant to operate under a master agreement with the agency or subcontract to the Executive Director. Work orders for specific as needed services would be issued from time to time by the Executive Director (subject to Board fiscal approval). Issuing discrete work orders for specific tasks will promote greater cost control compared to approving a broader scope of work.

The ideal consultant would be comfortable working in a support role under a work order driven contract. Importantly, the consultant should be willing to work very closely with and under the Executive Director's direction and with UWCD. Not all consultants would necessarily be comfortable with the proposed arrangement. However, the Executive Director believes such an arrangement would provide the Agency with the most flexible and cost-effective and approach to completing the GSP.

In terms of consultant selection, the Agency's purchasing policy does not explicitly require a formal competitive solicitation for the proposed as-needed consulting services. Therefore, it appears that the work could be sole sourced based on an Executive Director recommendation or a consultant could be selected through a competitive process. If the Board prefers a competitive process, the Executive Director recommends issuing a request for statements of qualifications and rate sheets.

Lastly, the Executive Director also serves as the GSP Project Manager for the Upper Ventura River Groundwater Agency (UVRGA) and will be making a similar recommendation to that agency's board. Although neither agency has any obligation to the other, it would be more efficient and cost-effective for both agencies if they were to utilize the same consultant because the Executive Director will be managing development of both GSPs. Your Board may consider directing the Executive Director to coordinate with UVRGA on consultant selection.

### **RECOMMENDED ACTION**

It is recommended that the Board receive an update from the Executive Director on ongoing discussions with UWCD concerning technical support services for the GSP, discuss options for servicing various GSP elements, and provide direction to staff.

### **BACKGROUND**

In July 2018, UWCD staff confirmed that the District will contribute \$50,000 of in-kind labor to MBGSA in the form of technical services. Approximately \$5,000 of the in-kind

labor was allocated to the basin boundary modification and the remaining \$45,000 was allocated to the plan area and basin setting chapter of the GSP.

During subsequent discussions with the Executive Director, UWCD staff expressed a willingness to explore a larger role in the GSP development that would extend beyond the \$45,000 of in-kind technical services. Services provided beyond the in-kind limit would be provided for a fee to MBGSA.

On October 18, 2018, the Executive Director briefed the Board on discussions with UWCD concerning technical staff support for the GSP and presented a three-pronged approach to completing the GSP consisting of services by UWCD and the Executive Director, with support from a to-be-determined consultant(s). The Board directed staff to continue the discussions with UWCD and return with a matrix of tasks and assignments with an eye toward maximizing the most cost effective and efficient means of completing the GSP.

**FISCAL SUMMARY**

Contracting with UWCD and consultant(s) for as needed services in of itself does not have a fiscal impact other than a modest about of labor for the Executive Director to participate in consultant selection and for counsel to review professional services agreements.

**ATTACHMENTS**

Table 1. Summary of Proposed Roles for Mound Basin GSP Preparation

Table 2. Draft Summary of Planned Scope of Work for Preparation of Mound Basin GSP to be Performed by UWCD

Table 3. Draft Cost Estimate for UWCD to Provide GSP Support to Mound Basin GSA

Action: \_\_\_\_\_

Motion: \_\_\_\_\_ 2<sup>nd</sup>: \_\_\_\_\_

K. Brown \_\_\_ J. Chambers \_\_\_ C. Everts \_\_\_ M. Mobley \_\_\_ G. Shephard \_\_\_

**DRAFT****Table 1. Summary of Proposed Roles for Mound Basin GSP Preparation**

Description	Executive Director	UWCD	Consultant(s)	Comments
Intro. (GSP Sect. 1)	PM/Review	Review/Support	Lead Author	+UWCD to support by providing GIS files and certain maps. +Consultant services will consist of non-technical writer +County GIS or consultant to prepare maps not prepared by UWCD
Description of Plan Area ( GSP Sect. 2.1)	PM/Review	Review/Support	Lead Author	+Consultant services will consist of non-technical writer +County GIS or consultant to prepare maps not prepared by UWCD
Basin Setting (GSP Sect. 2.2)	PM/Review	Lead Author	Support, as needed	+UWCD support only for Section 2.2.4
Sustainable Management Criteria (GSP Sect. 3.1 – 3.4)	Lead Author	Review/Support	Support, as needed	+ED policy lead, UWCD to provide technical support +Consultant services to provide additional support on specific topics, as needed.
Monitoring Network (GSP Sect. 3.5)	PM/Review	Lead Author	Support, as needed	+3.5.1: ED to provided discussion of how monitoring addresses sustainability indicators +3.5.3: UWCD support only for representative monitoring discussion
Projects and Management Actions (GSP Sect. 4)	Lead Author	Review/Support	Support, as needed	+If projects are desired, UWCD will perform modeling to evaluate effects of projects and/or management actions and engineering firm will be hired to develop required elements for each project.
Plan Implementation (GSP Sect. 5)	Lead Author	Review/Support	Support, as needed	
Appendices (GSP Sect. 6)	Lead for Non-Technical Appendices	Lead for Technical Appendices	Support, as needed	
Prepare Draft and Final GSP Documents	PM/Support	Review/Support	Lead	+Consultant services will consist of an editor and publications team to edit and produce draft(s) and final GSP

Table 2. Summary of Planned Scope of Work for Preparation of Mound Basin GSP to be Performed by United Water Conservation District (UWCD), including UWCD Deliverables and Estimated Delivery Dates

Task	Description of Work to be Performed by UWCD Staff	UWCD Deliverable(s)	Estimated Delivery Date(s)
Task 1 – Project Coordination	<ul style="list-style-type: none"> <li>Staff workshops—UWCD staff will aid MBGSA and any consultants in developing and presenting supporting data and other materials as needed at staff workshops.</li> <li>Agency coordination—UWCD staff will aid MBGSA and any consultants in coordinating and providing required information as needed to support project management requirements of the MBGSA and the California Department of Water Resources (DWR).</li> </ul>	<ul style="list-style-type: none"> <li>Attendance at up to four staff workshops, preparation of up to 15 PowerPoint slides for each workshop, participation in up to two 1-hour conference calls with the MBGSA’s consultant prior to each workshop.</li> <li>Attendance at up to twelve 1-hour teleconferences with the MBGSA, its consultant, and DWR, as needed.</li> </ul>	<ul style="list-style-type: none"> <li>Workshops will be attended as needed; assumed to occur once each in calendar years (CYs) 2019 and 2020, twice in 2021.</li> <li>Teleconferences will be attended as requested, assumed to occur quarterly throughout CY 2019, 2020, and 2021.</li> </ul>
Task 2 – Compilation of Existing Data	<ul style="list-style-type: none"> <li>UWCD staff to compile existing data for the Fillmore and Piru basins that are available in UWCD’s electronic databases and deliver to MBGSA and any consultants the following: well inventory (including location and construction information), well production records, groundwater elevation data, groundwater and surface water quality data, precipitation data, stream gaging data. <b>Note—construction, location, pumping, and water quality data for private wells will be provided to the MBGSA for the sole purpose of analysis and reporting required under SGMA for development of GSPs for the Mound Basin. UWCD will release the data only after receiving written agreement from MBGSA that the data will not be used for other purposes or projects.</b></li> </ul>	<ul style="list-style-type: none"> <li>Compile and provide the listed data to MBGSA and any consultants in Excel, Access, or ESRI shapefile format.</li> </ul>	<ul style="list-style-type: none"> <li>Data—within one month after the MBGSA’s MBGSA signs an agreement with UWCD regarding use of data from private wells. Assume February 28, 2019.</li> </ul>
Task 3 – Assessment of Existing Data and Data Gap Analysis	<ul style="list-style-type: none"> <li>UWCD to provide assistance to MBGSA in determining whether and where any notable data gaps (for the purpose of monitoring groundwater sustainability) exist in the groundwater monitoring network present in the Mound Basin. UWCD to prepare a brief technical memorandum summarizing those data gaps, to be reviewed by MBGSA Executive Director.</li> </ul>	<ul style="list-style-type: none"> <li>Data gap memo – one draft and one final, with comments addressed.</li> <li>Attend two 2-hr in-person meetings with MBGSA to discuss data gaps and memo.</li> </ul>	<ul style="list-style-type: none"> <li>May 31, 2019.</li> </ul>
Task 4 – Monitoring Program and Data Management System	<ul style="list-style-type: none"> <li>UWCD to provide assistance to MBGSA in evaluating the existing monitoring program in the Mound Basin, and in developing recommendations for expansion or changes to the monitoring program, if necessary. UWCD to prepare a technical memorandum summarizing those recommendations, to be MBGSA reviewed by MBGSA Executive Director. UWCD to provide input and assistance to GSA concerning design and development of a Data Management System (DMS). DMS will be constructed and populated by others.</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring plan memo – one draft and one final, with comments addressed. .</li> <li>Attend two 2-hr in-person meetings with MBGSA to discuss monitoring plan and memo.</li> <li>Attend two 2-hr in-person meetings with MBGSA to discuss DMS.</li> </ul>	<ul style="list-style-type: none"> <li>July 31, 2019.</li> </ul>
Task 5 – Water Level and Water Quality Data Collection and Analysis	<ul style="list-style-type: none"> <li>UWCD to provide assistance to MBGSA in developing a proposed sampling and analysis program for future SGMA-related water-quality monitoring in the Mound Basin. UWCD to prepare a Sampling and Analysis Plan (SAP), to be reviewed by MBGSA Executive Director.</li> </ul>	<ul style="list-style-type: none"> <li>SAP</li> <li>Attend two 2-hr in-person meetings with MBGSA to discuss SAP.</li> </ul>	<ul style="list-style-type: none"> <li>September 30, 2019.</li> </ul>
Task 6 – Develop GSP Section 2.2	<ul style="list-style-type: none"> <li>UWCD to develop water budgets for the Mound Basin using the Ventura Regional Groundwater Flow Model (VRGWFM) and GSP Section 2.2.3. Groundwater modeling work completed already will be used to develop the historical water budget and modeling of future conditions (projected water budgets) will require additional simulations, and provide them to the MBGSA Executive Director for review and subsequent inclusion in the GSP.</li> <li>UWCD to adapt/re-package the hydrogeologic conceptual model (HCM) developed for the VRGWFM to address the requirements of the GSP Emergency</li> </ul>	<ul style="list-style-type: none"> <li>GSP Sections 2.2.1 through 2.2.3 – one draft and one final, with comments addressed.</li> <li>Attend six 2-hr in-person meetings with MBGSA to discuss GSP Section 2.2.</li> </ul>	<ul style="list-style-type: none"> <li>GSP Section 2.2.1 and 2.2.2: September 30, 2019.</li> <li>GSP Section 2.2.3: December 31, 2019.</li> <li>GSP Section 2.1.1 and 2.1.2 listed items: December 31, 2019. .</li> </ul>

Table 2. Summary of Planned Scope of Work for Preparation of Mound Basin GSP to be Performed by United Water Conservation District (UWCD), including UWCD Deliverables and Estimated Delivery Dates

Task	Description of Work to be Performed by UWCD Staff	UWCD Deliverable(s)	Estimated Delivery Date(s)
	<p>Regulations for GSP Section 2.2.1. MBGSA Executive Director will review the HCM. .</p> <ul style="list-style-type: none"> <li>• UWCD to develop current and historical groundwater conditions section (2.2.2). MBGSA Executive Director will review the HCM.</li> <li>• Section 2.2.4 will be prepared by MBGSA or a consultant, with technical support from UWCD.</li> <li>• UWCD to provide draft text, tables, and figures for portions of Section 2 of the GSPs, as follows:               <ul style="list-style-type: none"> <li>• Section 2.1.1 maps of:                   <ul style="list-style-type: none"> <li>• area covered by GSP</li> <li>• adjudicated areas, other agencies within each basin, and areas covered by an alternative plan</li> <li>• jurisdictional boundaries of federal or state land</li> <li>• existing land-use designations</li> <li>• density of wells per square mile</li> </ul> </li> <li>• Section 2.1.2 descriptions of:                   <ul style="list-style-type: none"> <li>• how existing monitoring networks will be incorporated into the GSP</li> <li>• how existing monitoring networks and programs may limit operational flexibility of the basins</li> <li>• any existing conjunctive use programs</li> </ul> </li> </ul> </li> </ul>		
<p>Task 7 – Development of Sustainable Management Criteria</p>	<ul style="list-style-type: none"> <li>• UWCD to be lead author of GSP Section 3.5 that describes the existing monitoring network and its ability to provide useful data for monitoring groundwater conditions relevant to sustainable management criteria. Section 3.5.3 will be prepared by MBGSA or a consultant, with technical support from UWCD.</li> <li>• UWCD to provide technical support to MBGSA and any consultants in developing GSP Sections 3.1 – 3.4,</li> <li>• UWCD to provide text for the following:               <ul style="list-style-type: none"> <li>• Describes how each minimum threshold will be quantitatively measured for each relevant sustainability indicator;</li> <li>• Evaluates causes of groundwater conditions that would lead to undesirable results;</li> <li>• Describes proposed monitoring protocols;</li> <li>• Selects and describes representative monitoring sites;</li> <li>• Assesses and describes improvements to the existing monitoring network (see Tasks 3 and 4).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Draft text (no more than 20 pages) for a portion of Section 3 of each GSP.</li> <li>• Staff attendance at up to two 2-hour in-person meetings and two 1-hour conference calls led by MBGSA and any consultant to assist with developing draft text regarding monitoring the sustainable management criteria.</li> </ul>	<ul style="list-style-type: none"> <li>• June 2020.</li> </ul>

Table 2. Summary of Planned Scope of Work for Preparation of Mound Basin GSP to be Performed by United Water Conservation District (UWCD), including UWCD Deliverables and Estimated Delivery Dates

Task	Description of Work to be Performed by UWCD Staff	UWCD Deliverable(s)	Estimated Delivery Date(s)
Task 8 – Projects and Management Actions	<ul style="list-style-type: none"> <li>UWCD to participate in meetings with the MBGSA and any consultants to select potential projects and management actions as required to achieve or maintain sustainable groundwater management.</li> <li>UWCD to perform flow and particle trace modeling of projects and management actions considered for inclusion in the GSP. Assume 8 model scenarios will be required, as well as processing of output and preparation of text for the GSP that describes model input and output.</li> </ul>	<ul style="list-style-type: none"> <li>Staff attendance at up to three 2-hour in-person meetings and three 1-hour conference calls led by MBGSA.</li> <li>Model output for 8 model runs (selected hydrographs, heads at selected times, particle traces at selected times, and water budget outputs).</li> <li>Provide GSP text, tables, and figures describing the model input and output (assume up to 16 pages, 16 maps, 4 graphs, and 4 tables).</li> <li>Attend four meetings: three 2-hour in-person meetings with MBGSA and one 3-hour public workshop to discuss and present modeling results .</li> </ul>	<ul style="list-style-type: none"> <li>As requested; one call and one meeting assumed to occur each month from July through September 2020.</li> </ul>
Task 9 – Stakeholder Engagement	<ul style="list-style-type: none"> <li>UWCD to assist MBGSA and its consultant at seven stakeholder meetings with:               <ul style="list-style-type: none"> <li>Development of presentation materials;</li> <li>Presentation of technical information;</li> <li>Receiving public feedback/comments;</li> <li>Developing responses to comments following each meeting.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Staff attendance at up to seven 3-hour stakeholder meetings, including interaction with the public (receiving feedback or comments).</li> <li>Preparation of up to 15 PowerPoint slides for each meeting, including 12 hours staff time each for preparation of slides and other materials;</li> <li>Participation in up to two 1-hour conference calls with the MBGSA and any consultants prior to each meeting.</li> <li>Preparation of written responses to technical feedback/ comments provided by stakeholders (assumed to require 4 hours staff time following each meeting).</li> </ul>	<ul style="list-style-type: none"> <li>Assume two meetings in 2019, three in 2020, and two in 2021, with planning conference calls held 1 month and 1 week before each meeting.</li> <li>Assume draft presentation materials will be submitted to MBGSA and any consultants no less than 1 week before scheduled meetings for review.</li> <li>Assume that the MBGSA will assign specific comments to UWCD 1 week after each meeting; UWCD will prepare draft responses within 14 days after receiving assignments, and will make revisions (if requested) within 7 days of receiving comments on draft responses.</li> </ul>
Task 10 – Prepare Groundwater Sustainability Plan	<ul style="list-style-type: none"> <li>UWCD to provide technical review of all other sections of the GSPs prepared by MBGSA's consultant.</li> </ul>	<ul style="list-style-type: none"> <li>Staff attendance at up to four 2-hour in-person meetings and four 1-hour conference calls led by MBGSA and any consultants to coordinate and work through revisions of portions of the GSPs prepared by UWCD, MBGSA, and any consultants.</li> <li>Staff review of complete drafts of the GSPs (40 hours review time assumed for each) and revised-draft GSPS (24 hours review time assumed for each), including preparation of comments and questions.</li> </ul>	<ul style="list-style-type: none"> <li>Participate in meetings and conference calls as needed to coordinate work; assume one call or meeting per month in the 8 months preceding July 2021.</li> <li>Review of draft text by MBGSA's consultant—UWCD to complete each review within 21 calendar days of receiving complete versions of the draft text.</li> </ul>

**Table 3. Cost Estimate for United WCD to Provide GSP Support to Mound Basin GSA**

Task	Description (see Table 2 for more detail regarding scope of work and assumptions)	Estimated Level of Effort (hours)								Est. Labor Cost (\$)²	Fiscal Year Task to be Completed	Labor Rate Escalation (%)
		Deputy GM	Chief Eng.	Sup. Hydro.	Senior Modeler	Senior Hydro.	Assoc. Eng.¹	Asst. Hydro.	Staff Hydro.			
1 - Project Coordination	-Prepare for and participate in 4 workshops -Attend 20 x 1-hr teleconferences	4	4	8		48	36			11,355.63	FY 2018-19 & 2019-20	3%
2 - Compilation of Existing Data	-Compile existing data, provide to MBGSA and consultants, if any			8		24		16		4,908.32	FY 2018-19	0%
3 - Assmt. Of Existing Data and Data Gaps Analysis	-Prepare one draft and one final data-gaps memo, address comments -Attend two meetings with MBGSA to evaluate data gaps and plan memo			12		60		16		9,350.64	FY 2018-19	0%
4 - Mon. Prog. and Data Mgmt. System	-Prepare one draft and one final mon-plan memo, address comments -Attend two meetings with MBGSA to develop monitoring plan and memo -Attend two meetings with MBGSA to plan Data Mgmt. System			12		72		24		11,683.29	FY 2019-20 <i>(some portions of this work may not be needed)</i>	3%
5 - Water Level and WQ Data Collection and Analysis	-Prepare one draft and one final sampling/analysis plan (SAP), address comments -Attend two meetings with MBGSA to develop monitoring plan and memo			12		72		24		11,683.29	FY 2019-20	3%
6 - Develop GSP Section 2.2	-Prepare one draft and one final version of GSP sections 2.2.1 through 2.2.3, address comments -Attend six meetings with MBGSA to develop Section 2.2 of the GSP			40	40	120	120	40	40	41,432.78	FY 2019-20	3%
7 - Develop Sust. Mgmt. Criteria	-Prepare or support preparation of one draft and one final version of portions of GSP sections 3.1 through 3.5, address comments -Attend two meetings and attend two conf. calls with MBGSA in support of this task			24		80	80	20	20	23,191.89	FY 2019-20	3%
8 - Projects and Mgmt. Actions	<i>If needed:</i> -Attend three meetings and attend three conf. calls with MBGSA to help develop projects and management actions -UWCD to perform flow and particle trace modeling of up to eight scenarios (each considered under four future climate conditions) for projects and management actions that may be considered in the GSP. Also to include GSP text describing input and output.	6	6	9	296	60	60			51,097.86	FY 2020-21 <i>(may not be needed)</i>	6%
9 - Stakeholder Engagement	-Prepare for and participate in 7 public meetings -Attend two 1-hr teleconferences prior to each meeting -Prepare written responses to technical feedback/comments after each public meeting			21	6	100	100	21	21	27,959.71	FY 2018-19, 2019-20, 2020-21	3%
10 - Review GSP	-Attend four 2-hour meetings and four 1-hr teleconferences -Review complete draft and revised draft of each GSP, provide comments and questions			80		80	24			21,638.76	FY 2020-21 & 2021-22	6%
<b>Total:</b>		<b>10</b>	<b>10</b>	<b>226</b>	<b>342</b>	<b>716</b>	<b>420</b>	<b>161</b>	<b>81</b>	<b>214,302.17</b>		

**Notes:**

¹ At this time, United's Associate Hydrogeologist position is vacant; therefore, an Associate Engineer is assumed to provide the level of effort estimated in this column. However, United is planning to fill the vacant Associate Hydrogeologist position, and the staff member that fills the position would likely provide support for the GSP effort. The billing rate for an Associate Hydrogeologist is anticipated to be similar to that for an Associate Engineer.

² Estimated labor costs are calculated based on estimated level of effort multiplied by United WCD staff labor rates for FY 2018-19 (as listed in executed consulting agreement with MBGSA, dated July 10, 2018) and assumes an annual escalation of those labor rates by 3% per year for work expected to be completed in fiscal years subsequent to FY 2018-19.



# MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY

## Item No. 8(d)

**DATE:** January 17, 2019  
**TO:** Board of Directors  
**FROM:** Executive Director  
**SUBJECT:** Isotope Study (Grant Category (b): Models and Studies)

### **SUMMARY**

The GSP grant includes funding for an isotope study to investigate sources and mechanisms of groundwater recharge, groundwater age and dynamics, interconnections between aquifers, and interaction between surface water and groundwater. Because isotope geochemistry is a highly specialized field within the broader field of hydrogeology, the GSP grant application stated that the MBGSA would consult with an expert geochemist prior to sampling to confirm the sampling procedures and analyses. The grant application also called for the expert geochemist to review and interpret the results and prepare a technical memorandum that includes conclusions that will be used to refine the hydrogeologic conceptual model of the basin.

The Executive Director requested a proposal from S.S. Papadopulos and Associates, an expert in groundwater geochemistry and the use of chemical and isotopic tracers to characterize basin recharge and hydrogeology (see attachment). S.S. Papadopulos and Associates' proposal is reasonably priced and is within the budget assumed for the professional services.

### **RECOMMENDED ACTION**

It is recommended that the Board approve professional services by S.S. Papadopulos and Associates for an amount not-to-exceed of \$19,311.60 (proposal amount of \$17,556, plus up to 10% contingency, to be authorized by the Executive Director on an as-needed basis) to assist the Agency with completing the isotope study described in the GSP grant application.

### **BACKGROUND**

The GSP grant includes a funding for an isotope study to investigate sources and mechanisms of groundwater recharge, groundwater age and dynamics, interconnections between aquifers, and interaction between surface water and groundwater. The study will consist of groundwater sampling from selected discrete zones of selected nested/cluster monitoring wells in the basin, laboratory analysis of general minerals and selected isotopes, data analysis, and preparation of a technical memorandum. Groundwater sampling will be coordinated with UWCD's ongoing groundwater monitoring activities.

### **FISCAL SUMMARY**

The full estimated cost of the isotope study (\$45,330) is included in the current fiscal year budget and will ultimately be funded primarily through grant proceeds (\$39,600). The full

isotope study budget includes the proposed professional services, laboratory fees, and UWCD labor for sampling. The isotope study budget estimate assumed \$18,000 for the proposed professional services, which is greater than the S.S. Papadopulos and Associates proposal estimate of \$17,556.

**ATTACHMENT**

S.S. Papadopulos and Associates proposal dated November 5, 2018.

Action: \_\_\_\_\_

Motion: \_\_\_\_\_ 2<sup>nd</sup>: \_\_\_\_\_

K. Brown \_\_\_ J. Chambers \_\_\_ C. Everts \_\_\_ M. Mobley \_\_\_ G. Shephard \_\_\_



**S.S. PAPANOPULOS & ASSOCIATES, INC.**  
ENVIRONMENTAL & WATER-RESOURCE CONSULTANTS

November 5, 2018

Bryan Bondy, Executive Director  
Mound Basin Groundwater Sustainability Agency  
P.O. Box 3544  
Ventura, CA 93006-3544

Subject: **Proposal for Mound Basin Water Quality and Isotope Study**

Dear Mr. Bondy:

S.S. Papadopoulos and Associates (SSP&A) is pleased to submit a proposal to conduct a water quality and isotope study for the Mound Basin Groundwater Sustainability Agency. Details of the proposed work are provided in Appendix A. SSP&A is an expert in groundwater geochemistry and the use of chemical and isotopic tracers to characterize basin recharge and hydrogeology. The resume for Brad Bessinger, Associate and Senior Geochemist, is attached as Appendix B.

An estimated budget based on our 2018-2019 Fee Schedule (Appendix C) is \$17,556. This budget includes the following allocation of costs:

Proposed Budget for Mound Basin Water Quality and Isotope Study		
Task	Description	Cost
1	Site Background / Data Review	\$ 3,344
2	Sampling Plan / Laboratory Coordination	\$ 2,508
3	Laboratory Data Evaluation / Interpretation	\$ 6,688
4	Technical Memorandum	\$ 5,016
<b>Total Cost</b>		<b>\$ 17,556</b>

Thank you for the opportunity to present this proposal. We look forward to assisting you in this matter. If you have any questions or require any additional information, please call the undersigned at (360) 566-7119, or send an e-mail to the following: [bbessinger@sspa.com](mailto:bbessinger@sspa.com).

Sincerely,

S.S. PAPANOPULOS & ASSOCIATES, INC.

Brad Bessinger, Ph.D., R.G.  
Associate | Senior Geochemist

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## **Appendix A**

### **Scope of Work**

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**Bryan Bondy**

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**From:** Bryan Bondy  
**Sent:** Saturday, October 27, 2018 11:58 AM  
**To:** Brad Bessinger  
**Subject:** RE: Mound Basin Project Info  
**Attachments:** Pages from Mound Well No 2 - Well Site Feasibility Study\_low\_res.pdf; Mound No 2 Report\_reduced.pdf

Hi Brad,

As discussed, I am sending information about the Mound Basin project. Please take a look and let me know if you have expertise in the subject matter we are addressing with the study and would like to make a proposal.

Please let me know if you have any questions.

Thanks!

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\*\*\*\*\*  
\*\*\*\*\*

Summary:

Mound Basin Groundwater Sustainability Agency is looking to complete a water quality and isotope study to help better understand the groundwater flow system of the Mound Basin, which has multiple aquifers. We have three number of multi-level monitoring wells in the basin that would be targeted for sampling and analysis of general minerals, isotopes, and age dating. There are production wells that could be sampled too. The description of the study that was included in our grant application is provided below. We are not locked into or limited to what is described in the grant application.

Scope of Services:

1. Familiarize yourself with the basin hydrogeology
2. Recommend laboratory analyses, laboratories to perform analyses, and any special sampling procedures
3. Review and interpret laboratory results
4. Prepare brief Technical Memorandum

Schedule:

We'd like to be ready to sample next spring. Technical memo by Fall 2019.

References:

1. I've attached a few cross-sections to this email
2. I've attached an older report that has some water quality info

3. The most recent basin study is available here for your reference: [https://www.unitedwater.org/images/stories/reports/GW-Conditions-Reports/2012/Mound Basin Assessment Report - FINA 5-16-12.pdf](https://www.unitedwater.org/images/stories/reports/GW-Conditions-Reports/2012/Mound%20Basin%20Assessment%20Report%20-%20FINA%205-16-12.pdf)

(There are some differences in formation and aquifer nomenclature between the attached cross-sections and the basin study. I can explain, if needed.)

#### Study Description from Grant Application:

### **Subtask 2.4 Water Quality and Isotope Study**

In contrast with many alluvial basins subject to SGMA requirements, the Mound Basin is not a simple alluvial fill basin. The basin has a series of three aquifers with varying water quality characteristics, including relatively poor quality groundwater throughout the Mugu Aquifer Zone and at least one area of highly mineralized “warm” water in the deep aquifer zones. The mineralized water appears to be sourced from older formations underlying the basin and directed upward along an unmapped fault zone. Additionally, groundwater levels in this area have proven difficult to calibrate in UWCD’s groundwater flow model. Investigation of the sources of recharge to the different aquifers could help refine the basin’s hydrogeologic conceptual model and numerical groundwater flow model. Moreover, insights gained will improve the MBGSA’s ability to manage groundwater quality.

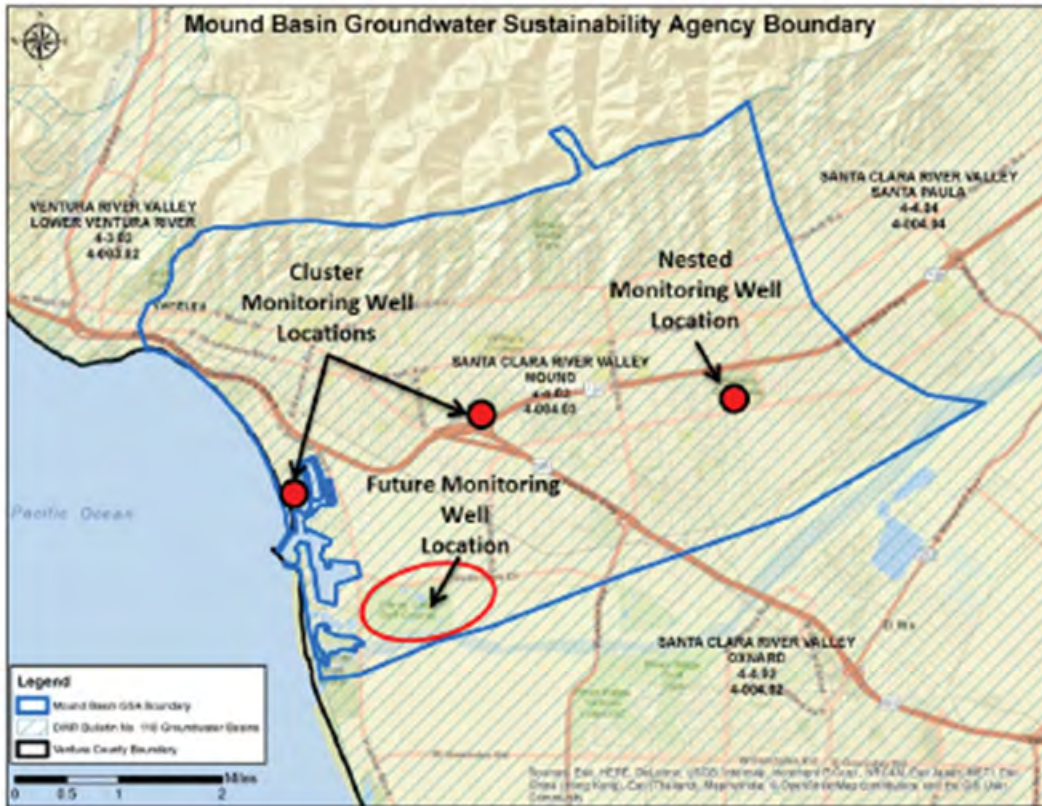
Stable and radioactive isotope analyses can be used to investigate sources and mechanisms of groundwater recharge, groundwater age and dynamics, interconnections between aquifers, and interaction between surface water and groundwater—all of which are data gaps in the Mound Basin. For example, the isotopic composition of groundwater (expressed as abundance of oxygen-18 and deuterium) can give insights into the recharge sources (precipitation vs. surface water vs. connate waters). Groundwater dating with radioactive isotopes can be used to assess the recharge rate and flow velocity of groundwater and is typically accomplished by measuring tritium ( $^3\text{H}$ ) and radiocarbon ( $^{14}\text{C}$ ) in groundwater samples. Additionally, USGS has used stable isotope ratios of sulfur in sulfate ( $\delta^{34}\text{S}$ ) to help further evaluate sources of recharge and in-situ reactions (Izbicki, et al, 2005).

This subtask includes four primary activities: groundwater sampling, laboratory analysis of general minerals and isotopes, data analysis, and preparation of a technical memorandum. Groundwater samples will be collected by UWCD staff as part of their routine groundwater monitoring program. It is anticipated that each discrete zone of the three nested/cluster monitoring wells in the basin will be sampled (8 total samples). Additionally, the monitoring well proposed in Task 2.5 will be sampled if it is constructed prior to the sampling activities (*please note this well has been removed from the grant and will not be drilled prior to this study*). (See Figure 4 for monitoring locations.) This would add another two to four samples. All samples will be analyzed for general minerals and the following isotopes:  $^2\text{H}/^1\text{H}$  ( $\delta\text{D}$ ),  $^{18}\text{O}/^{16}\text{O}$  ( $\delta^{18}\text{O}$ ),  $^{34}\text{S}/^{32}\text{S}$  ( $\delta^{34}\text{S}$ ),  $^3\text{H}$ ,  $^{14}\text{C}$ , and  $^{13}\text{C}/^{12}\text{C}$  ( $\delta^{13}\text{C}$ ). Laboratory fees are approximately \$1,800 per sample for the above-listed analyses. MBGSA will consult with an expert geochemist prior to sampling to confirm the sampling procedures and analyses. The expert geochemist will also be asked to review and interpret the results and prepare a technical memorandum that includes conclusions that will be used to refine the hydrogeologic conceptual model of the basin. MBGSA anticipates working with John Izbicki (USGS) or another expert with similar isotope experience.

(Reference: Izbicki, J. A, Christensen, A.H, Newhouse, M.W., and Aiken, G.R., 2005. Inorganic, isotopic, and organic composition of high-chloride water from wells in a coastal southern California aquifer. Applied Geochemistry. 20, 1496-1517.)

**Figure 4: Task 2.4 and 2.5 Locations**

Four Nested/Cluster Monitoring Well Locations for Water Quality and Isotope Study (Task 2.4)  
New Multi-Level Monitoring Well (Task 2.5)



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## **Appendix B**

**Resume for Brad Bessinger, Ph.D., R.G.**

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# BRAD A. BESSINGER

Associate, Senior Geochemist

## AREAS OF EXPERTISE

- Inorganic and Isotope Geochemistry
- Contaminant Fate and Transport
- Water Resource Evaluations
- Environmental Forensics
- Reactive Transport Modeling
- Monitored Natural Attenuation

## SUMMARY OF QUALIFICATIONS

Dr. Bessinger specializes in environmental chemistry and the analysis of fate and transport of organic compounds and metals in the environment. His experience includes designing and conducting contaminant fate and transport studies, environmental forensics investigations, and water quality assessments. His consulting services include obtaining and interpreting geochemical and isotopic data, developing reactive transport models for sediment and groundwater, preparing site treatability studies, and investigating the sources of contaminants for litigation, insurance claims, and Natural Resource Damage Assessments (NRDA). His expertise in geochemistry and reactive transport modeling is routinely used in monitored natural attenuation (MNA) investigations and aquifer storage and recovery (ASR) evaluations.

## REPRESENTATIVE EXPERIENCE

S.S. Papadopoulos & Associates, Inc., Portland, Oregon

### CONTAMINANT FATE AND TRANSPORT

- **Radionuclide Fate and Transport Modeling, Missouri** — Predicted the mobility of radionuclides in uranium processing wastes in a solid waste landfill. Conducted a laboratory evaluation of source mineralogy, speciation, and leaching potential. Developed a humic acid complexation thermodynamic database and used it to calibrate a reactive transport model. Evaluated the effectiveness of monitored natural attenuation (MNA) in preventing groundwater radionuclide migration to a nearby river. Identified significant factors affecting radium generation in leachate. Concluded significant attenuation would occur in the landfill vadose zone and underlying aquifer. Prepared a summary report for submission to the U.S. Environmental Protection Agency (USEPA).
- **Reactive Transport Modeling of Arsenic, Selenium, and Metals, Nevada** — Served as principal geochemist on a natural attenuation investigation of arsenic and metals in groundwater underlying a series of flue-gas desulfurization evaporation ponds. Evaluated historical data, directed field and laboratory investigations to characterize site geochemistry, and developed a reactive transport model to evaluate the effectiveness of natural attenuation. Prepared reports, presentations, and represented client to lead regulatory agency.
- **Hexavalent Chromium Leaching Investigation, Washington** — Evaluated the potential for hexavalent chromium to be leached into groundwater at the Hanford Site 100-D groundwater operable unit (OU). Developed kinetic-based, solid-solution reactive transport model that simulated soil column leaching tests. Geochemical formulation was incorporated into MT3D to evaluate field-based remedies.

<b>YEARS OF EXPERIENCE: 20+</b>
<b>EDUCATION</b> <b>PhD</b> , Geochemistry, University of California at Berkeley, 2000 <b>MS</b> , Rock Mechanics, University of California at Berkeley, 1997 <b>BS</b> , Engineering Geology, Stanford University, 1993
<b>REGISTRATIONS</b> <b>Registered Geologist:</b> Oregon No. G2117 <b>Licensed Geologist:</b> Washington No. 2847
<b>PROFESSIONAL HISTORY</b> <b>S.S. Papadopoulos &amp; Associates, Inc.</b> , Senior Geochemist, 2008 to present <b>Exponent, Inc.</b> , Senior Geochemist, 2003–2008 <b>URS Corporation</b> , Senior Geochemist, 2000–2003 <b>University of California at Berkeley</b> , Research Assistant, 1994–2000

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- **Port of Tacoma Arsenic Fate and Transport Study**, Washington — Conducted a geochemical investigation as part of a Remedial Investigation to determine arsenic mobility in groundwater affected by slag. Designed a geochemical study to assess arsenic speciation and mobility, including sequential extractions and batch leaching and adsorption tests. Project included evaluating the effectiveness of monitored natural attenuation (MNA).
- **Arsenic and Boron Source Mobility Study**, Florida — Conducted a geochemical investigation to determine arsenic and boron mobility at a former industrial facility. Metals speciation and mobility were determined using electron microprobe analysis, sequential extractions, and batch leaching and adsorption tests. Developed a reactive transport model to predict long-term impacts on drinking water aquifers.
- **Copper and Zinc Remedial Alternatives Evaluation**, British Columbia — Served as the lead geochemist on an interdisciplinary expert panel to assess the effectiveness of proposed remediation at an industrial site used for the loading and unloading of bulk mineral ore concentrates (copper, lead, zinc and nickel sulfides). Evaluated site data and previously unidentified remedial alternatives. Developed a conceptual site model of copper and zinc fate and transport to support the alternatives evaluation. Submitted a report to Environment Canada.
- **Monitored Natural Attenuation of Zinc**, Oregon — Developed reactive transport groundwater models to evaluate the fate and transport of zinc in groundwater at two former zinc galvanizing sites. Calibrated the models to existing site data and forecasted the downgradient extent of zinc migration. Identified significant attenuation of zinc in the aquifer that would prevent impacts to a nearby river. Prepared reports for clients for submission to lead regulatory agency as part of No Further Action Determination Requests.
- **Fate and Transport of Polychlorinated Biphenyls (PCBs)**, Missouri — Evaluated the potential for offsite, colloidal transport of PCBs via the groundwater pathway. Developed low-flow sampling and testing procedures and evaluated the effects of sample filtration by interpreting congener distributions in unfiltered groundwater, filtered samples, and filters. Also provided technical review of a PCB surface-water fate and transport/bioaccumulation model to determine the effectiveness of site remediation.
- **RCRA Facility Investigation of Lead Smelter, East Helena**, Montana — As senior geochemist for this project, identified geochemical and isotopic source signatures in groundwater to establish nature and extent of contamination. Consulting also included site geochemical investigations for development of a groundwater model and selection of remedial alternatives for arsenic and selenium contamination.
- **Arsenic Monitored Natural Attenuation (MNA) Performance Assessment**, Texas — Evaluated monitored natural attenuation (MNA) as a remedy for arsenic in groundwater. Designed a field, laboratory and modeling study following USEPA guidance on the use of MNA to achieve appropriate cleanup levels in groundwater within a reasonable timeframe. Identified attenuation mechanisms and rates, sequestration stability, and aquifer capacity. Developed a reactive transport model to demonstrate that monitored natural attenuation is an effective remedy for achieving appropriate cleanup levels in groundwater.
- **Hexavalent Chromium Fate and Transport Evaluation**, California — Designed a geochemical study of hexavalent chromium in groundwater. Conducted geochemical characterization of vadose zone soils to quantify adsorptive and reductive capacity. Incorporated laboratory results into a geochemical reactive transport model to assess fate and transport of historical releases. Prepared an expert report for litigation.
- **VOC Remediation Oversight**, Illinois — Provided third-party review for USEPA Region 5 at an industrial site contaminated by trichloroethylene (TCE) and carbon tetrachloride (CT) in

## BRAD A. BESSINGER

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groundwater. Reviewed and provided comments on technical reports describing remediation performance monitoring results and in-situ treatability studies involving zero-valent iron (ZVI) and organic substrate amendments. Assessment included evaluating geochemical evidence for reductive dechlorination of solvents and potential field-scale implementation issues.

- **VOC Remedial Alternatives Evaluation, Illinois** — Reviewed the technical basis for selecting appropriate remediation of a TCE groundwater plume. For the USEPA, assessed the accuracy of conceptual and groundwater flow models being used to forecast contaminant fate and transport under several remediation scenarios. Evaluated spatial distribution of TCE in groundwater and conducted particle-tracking and statistical-trend analyses. Concluded that model calibration was poor and estimates of clean-up times highly uncertain. Provided recommendations on improving model predictions.
- **VOC Degradation Modeling, New York** — Conducted a technical review of PCE, TCE, and DCE degradation rates in sand and gravel aquifers. Identified probable degradation pathways based on site hydrogeology and geochemistry. Provided scientifically defensible degradation rate constants and retardation factors for modeling fate and transport of VOCs in groundwater.
- **Facilitated Dioxin Groundwater Transport Assessment, Rhode Island** — Evaluated the potential for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) to be mobilized by VOC cosolvents and/or natural dissolved organic matter in groundwater. Reviewed the scientific literature and developed a cosolvent solute-specific log-linear model to describe partitioning between mobile and immobile phases. Established that site conditions are not conducive to facilitated groundwater transport; however, dissolved humic and fulvic acids could mobilize TCDD and generate concentrations in groundwater within the range of observations.
- **National Institute of Health Research Grant on Remediation of Recalcitrant Hazardous Substances in Sediment** — Conducted basic research into the use of reactive amendments as an alternative remediation technology for hazardous metal and metalloid contaminants (As, Hg, Se, Pb, Cu) of high priority in sediments at Superfund and other contaminated sites. Developed a biogeochemical reactive transport model to evaluate the effectiveness of various chemical amendments in reducing arsenic and mercury mobility in sediment caps. Model results were also investigated in laboratory experiments to identify reaction products and measure dissolution rates. The refined model and laboratory experiments were designed to assist in the selection of suitable sites for sediment capping.
- **Onondaga Lake Sediment Remedial Design, New York** — Predicted the long-term effectiveness of chemical amendments for neutralizing hyperalkaline pH and mercury in a proposed sediment cap. Conducted batch tests to assess the effectiveness of different chemical amendments in treating hyperalkaline pore water. Also developed geochemical models to simulate observed chemical changes and to predict long-term effectiveness under field conditions. Results were used as part of site feasibility studies, guiding the eventual remedy.
- **Groundwater Denitrification and Perchlorate Reduction Modeling, California** — Parameterized a Monod kinetic MT3DMS model for simulating denitrification and perchlorate reduction in a sand and gravel aquifer. Evaluated aquifer geochemistry and assigned rates for fate-and-transport calculations based on observed contaminant concentrations, inferred microbial activity, and inhibiting processes.
- **Acid Mine Drainage Remediation Performance Assessment, California** — Apportioned sources of arsenic and metals in a mine waste-contaminated stream using diagnostic ratios, mass balance, and chemical mixing/reaction models. Assessed changes in bioavailability due to site remediation by predicting the aqueous speciation of contaminants. Study results were used to determine remediation effectiveness for litigation.

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- **Manganese Groundwater Plume Evaluation, Oregon** — Conducted a geochemical investigation to determine impacts of a dissolved manganese plume on ecological receptors in riverine sediment downgradient of an industrial site. Evaluated groundwater, sediment, and pore water biogeochemistry and concluded manganese attenuation was occurring. Manganese concentrations in sediment pore water were demonstrated to be within the natural range, resulting in the suspension of site regulatory activities.
- **Hanford Groundwater Geochemistry and Chromium Modeling, Washington** — Project work included technical review of documents providing the basis for modeling chromium using MT3DMS. Also developed environmental calculation briefs for evaluating and interpreting groundwater geochemistry.
- **Adaptation of Hydrocarbon Model for Multicomponent Simulations, USEPA** — Determined biodegradation rate parameters for modeling surrogate petroleum hydrocarbon compounds using the USEPA's Hydrocarbon Spill Screening Model (HSSM). Evaluated the scientific literature and developed reaction stoichiometries and appropriate rate constants. Also provided technical guidance on code modification.
- **VOC Exposure Assessment, Illinois** — Assessed the potential for historical atmospheric emissions of vinyl chloride and 1,1-dichloroethene (1,1-DCE) from an industrial facility. Developed a kinetic model describing volatilization and polymerization within the plant's reactors. Also modeled potential releases from an industrial lagoon receiving plant effluent. Results were used in developing expert opinions on alleged exposure as part of a toxic tort case.
- **VOC Remediation Performance Assessment, Oregon** — Evaluated the effectiveness of groundwater remediation efforts on reducing concentrations of volatile organic compounds (VOCs) in groundwater. Work was conducted as part of a site remediation performance assessment.
- **Slag Impact Evaluation, Oregon** — Evaluated groundwater quality data to determine the potential impact of slag materials on metals concentrations in downgradient monitoring wells. Used geochemical modeling to demonstrate offsite migration of dissolved metals was being mitigated by natural attenuation.

### ENVIRONMENTAL FORENSICS

- **Groundwater Salinity Source Investigation, Nevada** — Served as principal geochemist to identify the nature and extent of Total Dissolved Solids (TDS) in naturally-saline groundwater. Work included the development of field and laboratory monitoring programs. Also identified source signatures using statistical methods, elemental ratios, and stable isotopes ( $\delta D$ ,  $\delta O$ ,  $\delta^{18}O-SO_4$ ,  $\delta^{34}S-SO_4$ ). Assessed potential impacts from natural brines, desulfurization pond releases, agricultural infiltration, and petroleum hydrocarbon releases. Determined sources using isotopic mixing and geochemical inverse models.
- **Groundwater Arsenic Source Evaluation, Oregon** — Served as principal geochemist to identify potential sources of arsenic at an upland facility constructed using natural channel sediments from the adjacent Willamette River. Evaluated historical data, including arsenic and iron concentrations in fill, sediments, groundwater, and porewater. Arsenic concentrations found to be consistent with naturally-elevated levels and/or sampling artifacts. Conducted a subsequent geochemical investigation to establish redox conditions and confirm the hypothesis that elevated levels are related to naturally-reducing conditions and not site activities. Results used as part of an effort to achieve a source control decision/closure.
- **PCE and TCE Groundwater Degradation Evaluation, California** — Assessed the potential for migration of PCE and TCE in a groundwater aquifer having multiple sources. Examined evidence

## BRAD A. BESSINGER

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for attenuation along a flowpath due to reductive dechlorination, abiotic degradation, and/or adsorption. Evaluated groundwater geochemistry to identify conditions conducive to attenuation and used compound ratio analysis and reactive transport modeling to test hypotheses. Work was performed as part of litigation to apportion relative contributions to a chlorinated solvent groundwater plume.

- **Groundwater Contaminant Source Evaluation, Wyoming** — Served as technical expert in litigation over sources of arsenic and organic contaminants in groundwater near a solid waste landfill. Performed statistical evaluations to determine background concentrations. Also determined sources of major ions in groundwater using geochemical mixing calculations. Prepared quarterly monitoring reports in compliance with State regulations. Prepared an expert report and provided a deposition.
- **Groundwater Arsenic Source Study, Montana** — Conducted an evaluation of potential sources of arsenic in groundwater in a smelter community. Compared reported dissolved concentrations to background levels, performed reactive transport modeling to assess migration from surface contamination, and utilized ion and isotopic ratios to distinguish water sources. Results were summarized in an expert report prepared for a toxic tort case.
- **Chlorinated Solvent Plume Evaluation, California** — Critically evaluated methods used by plaintiffs' technical expert for determining sources of VOCs (PCE, TCE, TCA, and 1,1-DCE) in groundwater. Identified and quantified uncertainty in source assessment using diagnostic ratios to age-date solvent plumes and determine source proximity. Also reviewed and summarized scientific literature on abiotic and biotic degradation and effects on data interpretation.
- **Post-Construction Mercury Source Study, Washington** — Identified sources of mercury in groundwater in a series of monitoring wells having concentrations above site action levels. Conducted statistical analysis and developed a geochemical model that simulated interaction between soil organics and mercury. Concluded (presented in the site remediation performance assessment) that measured concentrations were related to the natural biogeochemical cycling of peat.
- **San Diego Harbor Sediment Environmental Forensics Investigation, California** — Investigated sources of polychlorinated biphenyls (PCBs) in harbor sediment. Evaluated historical sources, Aroclor and homolog concentrations, and the distribution of PCB congener fingerprints. Prepared a report for mediation between potentially responsible parties.
- **Port of Los Angeles Contaminated Sediment Investigation, California** — Investigated the sources of metals in contaminated sediment. Performed statistical and spatial analyses of sediment chemistry, and prepared a report allocating client contribution to observed contaminant levels.
- **City Well Contamination Study, Idaho** — Evaluated potential sources of petroleum hydrocarbons, BTEX compounds, and PAHs to groundwater in this city's municipal wells and sediment. Study included review of historical site operations, comparison of data to site background, and spatial distributions. Results were used to assist client in resolving potential environmental site liabilities.
- **VOC Source Assessment, California** — Conducted an apportionment evaluation to determine the relative contribution of VOCs (PCE, TCE, TCA, 1,1-DCE, 1,2-DCE, and 1,1-DCA) in groundwater and indoor air. Utilized chemical ratios to determine sources and degradation rates of compounds. Reactive transport modeling was used to support apportionment.

### WATER QUALITY ASSESSMENTS

- **WRD Aquifer Storage and Recovery Arsenic (ASR) Evaluation, California** — Performed a geochemical assessment for the Water Replenishment District (WRD) of Southern California to

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evaluate potential effects of the ASR system on liberation of arsenic from aquifer minerals. Designed a laboratory study of aquifer sediments, including arsenic speciation and sequential extraction analysis. Project included technical oversight and geochemical modeling using the USGS-supported geochemical model PHREEQC.

- **Woodland Aquifer Storage and Recovery (ASR) Mineralogy Evaluation, California** — Conducted an evaluation of the effects of aquifer geochemistry on the quality of recovered water from the proposed City of Woodland's ASR system. Reviewed mineralogical and chemistry data and used the USGS-supported geochemical model PHREEQC to assess potential impacts associated with arsenic, selenium, and hexavalent chromium in aquifer minerals. Also determined effects associated with residual ozone. Provided model predictions and recommendations on system operation to reduce potential impacts.
- **Groundwater Quality Impact Assessment, Oregon** — Predicted the effects of a proposed aggregate mining and processing operation to cause adverse impacts to groundwater quality and quantity in downgradient irrigation supply wells. Reviewed water quality analyses from irrigation wells and conducted geochemical modelling to predict changes in groundwater pH. Model simulated oxidation-reduction reactions related to carbon and nitrate cycling, groundwater degassing, mineral dissolution, and cation exchange.
- **WRD Aquifer Storage and Recovery (ASR) Compatibility Evaluation, California** — Evaluated water chemistry data in support of the Water Replenishment District of Southern California's Indirect Potable Reuse (IPR) Injection Well Feasibility Study. Work included using PHREEQC to assess the likelihood of mineral precipitation reactions to cause clogging, and the identification of processes that could generate elevated concentrations of arsenic in recovered water. Concluded no impacts were likely. Provided recommendations to mitigate any observed effects in the future.
- **Calleguas Aquifer Storage and Recovery (ASR) Well Performance Assessment, California** — Evaluated sources of poor ASR system well performance in selected wells for the Calleguas Water District. Reviewed water-chemistry data and identified potential clogging issues associated with degassing and strong redox-fronts near affected wells. Provided recommendations on changes in injection well chemistry and pumping rates to improve performance.
- **Bowling Green Aquifer Storage and Recovery (ASR) Compatibility Evaluation, Ohio** — Designed a geochemical investigation to evaluate the compatibility of injecting treated surface water into a carbonate aquifer affected by anoxic conditions. Used PHREEQC geochemical model to determine the effects of groundwater mixing on constituent concentrations and potential mineral precipitates. Also developed a reactive transport model to predict effects of aquifer mineral dissolution on the fate and transport of constituents such as arsenic and sulfate that could potentially be mobilized during system cycling. Evaluated operational measures that could be employed to mitigate possible water quality impacts.
- **Aquifer Storage and Recovery (ASR) Performance Assessment, Oregon** — Evaluated the effects of elevated iron and manganese in injected water on the performance of an existing ASR system. Reviewed site data and natural redox conditions in the aquifer. Concluded that the primary injectate was particulate iron and manganese oxides and that storage in the ASR aquifer could result in manganese re-dissolution. Evaluated mixing conditions and natural pore throat sizes to assess vulnerability of the ASR system due to episodic introduction of the metal oxides.
- **Redmond Water Supply Well Iron and Manganese Investigation, Washington** — Investigated changes in iron and manganese concentrations in water supply wells. Reviewed geological logs and historical water quality monitoring data. Reported that the aquifer was naturally-reducing due to the presence of peat in the aquifer. Biodegradation of this material naturally contributes to the release of iron and manganese from aquifer minerals to groundwater. Changes in groundwater flow over time due to groundwater usage in the basin may have contributed to migration of locally-

## BRAD A. BESSINGER

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reducing conditions to the impacted wells.

- **Aquifer Storage and Recovery (ASR) Compatibility Evaluations**, Oregon — Conducted evaluations of chemistry data from several ASR systems in Oregon (City of Cornelius, City of Prineville, City of Dufur). Work included an evaluation of potential changes in water quality caused by mixing groundwater with injected water and an assessment of mineral precipitation reactions that could potentially occur. Calculations were performed using the U.S Geological Survey (USGS)-supported geochemical model PHREEQC. Provided summary reports identifying potential water-quality changes and/or subsurface mineral precipitation that could occur.
- **Kennewick Aquifer Storage and Recovery (ASR) Efficiency Evaluation**, Washington — Evaluated chemistry of recovered water to quantify the relative proportion of injected water recovered during system operation. Reviewed general chemistry of injected water and groundwater and developed mixing curves for indicator constituents to assess relative proportions present in recovered water. Also identified water-aquifer reactions deduced from the mixing curves and the potential long-term effects of these reactions on water quality. Developed a 2D reactive transport model to confirm hypotheses.
- **Tigard Aquifer Storage and Recovery (ASR) Compatibility Evaluation**, Oregon — Evaluated potential changes in water quality caused by mixing groundwater with injected water for the City of Tigard ASR system. Reviewed laboratory data and performed mixing calculations using the USGS-supported geochemical model PHREEQC. Determined potential for mixing to affect dissolved constituent concentrations (including trihalomethanes) and the potential for mineral precipitation/clogging of the system. Prepared summary report for client.
- **Meridian Aquifer Storage and Recovery (ASR) Aquifer Conditioning Study**, Idaho — Determined the feasibility of conditioning an aquifer to create an oxidized treatment zone to remove dissolved manganese from public supply groundwater for the City of Meridian. Designed sampling and analysis plans to characterize the geochemical conditions in the aquifer. Also developed a reactive transport model to simulate pilot-scale conditioning experiments, thereby identifying the factors that control oxygen demand and manganese concentrations. The model was used to identify the number of cycles needed to achieve conditioning and to evaluate the performance of chemical oxidants to achieve more rapid aquifer oxidation.
- **Marcellus Shale Baseline Water Quality Evaluation**, West Virginia — Conducted a baseline water-quality assessment in an area undergoing natural gas exploration and production. Compared constituent concentrations in groundwater to standards protective of drinking water resources. Also determined potential sources of dissolved ions using ion ratio plots and compared these results to previous investigations in the region. Evaluated composition of hydrocarbon gases in shallow groundwater to establish baseline sources and ambient concentrations. A monitoring report was developed that identified water-quality impairments pre-dating Marcellus gas production.
- **USEPA Pavillion Hydraulic Fracturing Study Technical Review**, Wyoming — Reviewed the technical basis for the USEPA's conclusion that hydraulic fracturing fluids were contaminating groundwater in a shallow aquifer in Pavillion, Wyoming. Evaluated site hydrology, well construction, laboratory reports, and reported concentrations of inorganic ions and petroleum hydrocarbons. Concluded that poor well construction was impacting groundwater chemistry. Also found that the USEPA based its conclusions on questionable laboratory data and did not adequately consider natural background conditions.
- **Mamm Creek Natural Gas Development Water-Quality Study**, Colorado — Evaluated groundwater quality in a natural gas-producing area to assess potential impacts associated with hydraulic fracturing and extraction. Analysis included an evaluation of spatial and temporal trends in chloride concentrations and an evaluation of methane sources as inferred from stable carbon

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isotopes. Provided baseline and impact reports.

- **Pipeline System Clogging and Remediation**, New Mexico — Conducted a geochemical study to identify the cause of pipeline scale and to determine if there was an alternative to periodic cleaning and rehabilitation. Work involved laboratory characterization of scale and geochemical modeling to identify factors responsible for its formation. Results were used to guide decisions on pipeline operation and maintenance.
- **Columbia Basin Groundwater Ages Study**, Washington — Participated in a study assessing groundwater sources and ages in the Columbia Basin Ground Water Management Area. Work utilized stable isotopes ( $\delta D$ ,  $\delta O$ ), chemical and isotopic age tracers (CFCs,  $SF_6$ ,  $^3H$  [tritium], and  $^{14}C$ ), and predictive numerical models to assess effects of agricultural withdrawals on the long-term supply of irrigation water.
- **Groundwater Acid Neutralization Study**, Oregon — Conducted a geochemical evaluation of a shallow aquifer that was contaminated by historical releases of acidic process water to identify *in-situ* remedies for neutralization. Identified mechanisms and rates of pH neutralization from bench-scale tests and evaluated potential field-scale performance for a focused feasibility study. Field application of the groundwater amendment successfully neutralized acidity.
- **Columbia Basin Gas Characterization**, Oregon — Performed a genetic characterization of gases in groundwater wells to assess potential natural gas resources. Distinguished methane sources by using dissolved and free gas compositions, stable carbon and hydrogen isotopes, and groundwater ages.
- **Groundwater Treatment System Optimal Operation Evaluation**, California — Identified optimal operating conditions for groundwater treatment systems based on water chemistry. Evaluation included systems to remove arsenic from groundwater by using ferric chloride and systems to prevent scale formation by using dissolved carbon dioxide.
- **Aquifer Storage and Recovery (ASR) Systems Modeling**, Washington — Investigated geochemical characteristics that affect the concentrations of arsenic and trihalomethanes (THMs) in these aquifer storage and recovery systems. Developed a kinetic-based reactive transport model to evaluate the effects of site-specific geochemistry and operating conditions on groundwater quality.
- **Stream Impact Assessment**, Michigan — Modeled the effects of reduced outflow from a surface impoundment on downstream water temperature.

### EXPONENT, INC., PORTLAND, OREGON

#### CONTAMINANT FATE AND TRANSPORT

- **Raritan River RI/FS Investigation**, New Jersey — Developed a geochemical reactive transport model to predict the potential for recontamination of clean cover materials placed over arsenic-contaminated sediments in a tidal wetland affected by industrial discharges and dumping. Used the model to evaluate the long-term effectiveness of a proposed cap.
- **Arsenic Remedial Alternatives Evaluation**, Minnesota — Designed and executed a geochemical study of arsenic fate and transport in groundwater at a former pesticide manufacturing facility. Developed field sampling plans, laboratory studies, and an integrated PHREEQC/MT3DMS model to predict the extent of arsenic migration to a potential water-supply aquifer. Evaluated the effectiveness of engineered remedial alternatives using model output for a site feasibility study.
- **Lake Tenkiller Natural Resource Damage Assessment (NRDA)**, Oklahoma — Provided litigation support as part of a Natural Resource Damage Assessment (NRDA) lawsuit. Investigated the fate and transport of arsenic, nutrients, pathogens, and metals in poultry litter applied within an



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agricultural watershed. Examined geochemical evidence for transport from litter-applied fields to rivers, streams, and lacustrine sediment, and compared to background and other anthropogenic sources. Also assessed biodegradation pathways and rates of organo-arsenical compounds and potential of these additives to be preserved in poultry litter and therefore susceptible to aerial dispersion and deposition as house dust.

- **Contamination Assessment and Reduction Project (CARP) Model Review for the Passaic River**, New Jersey — Provided technical review of the CARP model for metals and organic contaminants in the Passaic River and Newark Bay. Evaluated adequacy of modeled geochemical processes and uncertainty associated with model-predicted source contributions and remediation effectiveness.
- **Mercury Fate and Transport Evaluation**, New Jersey — Summarized the current scientific understanding of mercury transport, fate, and bioaccumulation for a client affected by regulatory actions concerning mercury methylation. Results were used by client to ensure cost effectiveness and success of proposed remedial actions.
- **Red Dog Mine Barium Investigation**, Alaska — Calculated the bioavailability of barium in soil affected by fugitive dust from mining operations. Evaluated field and laboratory methods for determining barium concentrations in soils, and developed geochemical models to interpret *in vitro* test results. Results were used in ecological risk assessment and were published as a peer-reviewed journal article.
- **Chromated Copper Arsenate (CCA) Geochemical Evaluation**, Florida — Evaluated the fate and transport of arsenic in CCA-treated wood being disposed in construction and debris landfills. Examined lysimeter experiments, speciation results, and groundwater monitoring data. Provided comments on the scientific validity of published conclusions regarding these data.
- **Chromium Geochemical Modeling**, New Jersey — Evaluated the natural attenuation of hexavalent chromium in a tidal marsh. Identified the major geochemical factors restricting migration under variable environmental conditions. Incorporated field and laboratory data into a kinetic-based, reactive transport model. Predicted potential migration of hexavalent chromium to soil and groundwater.
- **Arsenic and Lead Bioavailability Investigations**, Missouri / New York — Identified the sources and relative bioavailability of arsenic and lead in soil in smelter communities. Compared mineralogy to ore concentrate material, smelter emissions, soil alteration products, and other anthropogenic sources. Developed reports to supplement human health-risk assessments.
- **Groundwater Transport of PCBs**, Washington — Evaluated the fate and transport of PCBs in groundwater at a site upgradient of an impaired surface-water body. Analyzed historical hydrology and chemistry data to identify source areas. Calculated solubility and identified transport mechanisms for specific congeners in groundwater. Used fate-and-transport modeling to demonstrate that groundwater contamination is unlikely to contribute to the observed impairment.

### ENVIRONMENTAL FORENSICS

- **Metals and Arsenic in Soil**, West Virginia — Managed an investigation of the contribution of a former smelter to concentrations of arsenic, cadmium, lead, and zinc in residential soil and house dust. Identified natural and anthropogenic sources of metals in the affected communities and statistically assessed background. Used spatial distribution and metal ratios to ascertain source. Prepared expert report to contest claims filed in a class-action lawsuit.
- **Manufactured Gas Plant Polycyclic Aromatic Hydrocarbons (PAHs) Source Assessment**, Washington — Managed an environmental forensics investigation of the sources of (PAHs in sediment near a former manufactured gas plant (MGP) and tar refinery. Analyzed historical

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documents pertaining to site operations and developed sampling and analysis plans to obtain source materials. Utilized chemical fingerprinting techniques to apportion sources as part of a cost allocation case.

- **Bulk Fuel Terminal Plant Polycyclic Aromatic Hydrocarbons (PAHs) (PAHs) Source Assessment**, Oregon — Managed an investigation of the sources of PAHs in sediment in an industrial waterway near a bulk fuel terminal. Developed site sampling and analysis plans to obtain source and sediment samples for chemical fingerprinting.
- **Phosphorus Source Assessment**, Washington — Managed a study to assess sources of elevated groundwater phosphorus concentrations suspected of contributing to lake eutrophication. Analyzed groundwater data and developed a geochemical reactive transport model to demonstrate the relative importance of natural versus anthropogenic sources. Report provided to lead agency in consideration of possible remedies.
- **Metals and Hydrocarbons in Waterway Sediment**, Washington — Assessed the contributions of industrial sources on polycyclic aromatic hydrocarbons (PAHs) and metals concentrations in an industrial waterway. Utilized site histories, industrial practices, and site discharge data to reconstruct historical releases and calculate mass loadings. Prepared report for a cost recovery lawsuit.
- **Oil Refinery Source Assessment**, New Jersey — Investigated sources of petroleum hydrocarbons and other organic and inorganic compounds at petroleum refineries and petrochemical facilities. Reconstructed site operations, materials handled, waste disposal practices, and process chemicals used. Related chemicals to those identified as exceeding soil quality criteria. Considered natural and urban background. Developed report for a Natural Resource Damage Assessment (NRDA) lawsuit.
- **Residential Soil Arsenic Contamination Evaluation**, Minnesota — Evaluated sources of arsenic in soils potentially affected by historical manufacturing of arsenical pesticides. Utilized electron microprobe speciation and metal ratio techniques to identify chemical fingerprints.
- **Mercury in Indoor Air Evaluation**, Pennsylvania — Evaluated claims of mercury exposure caused by removal of natural gas pressure regulators. Critiqued removal procedures and calculated evaporation rate of elemental mercury. Documented sources/evidence of variability in exposure caused by removal. Prepared expert report to contest claims filed in a class-action lawsuit.
- **Dioxin in Lake Sediment Expert Testimony Support**, Texas — Provided expert testimony support for a study evaluating the transport and fate of dioxin in lacustrine environments. Reviewed site-specific loads, hydrology, and chemical data. Compared likely sediment transport processes to potential air deposition pathways. Used scientific results, site history, and sworn depositions to apportion dioxin contributions to sediment

### WATER QUALITY ASSESSMENTS

- **Guadalupe River Mercury Total Maximum Daily Load (TMDL) Assessment**, California — Reviewed technical basis for establishing numeric targets for a proposed TMDL for the Guadalupe River in California. Evaluated site data and provided guidance on effectiveness of various source control measures and methyl mercury reduction plans. Prioritized measures based on effectiveness and the potential for successful implementation.
- **San Francisco Bay Mercury Total Maximum Daily Load (TMDL) Assessment**, California — Analyzed effectiveness TMDL for mercury in San Francisco Bay. Evaluated assumptions inherent in the scientific approach within the context of source assessment and numeric targets, mercury methylation, and food web pathways. Demonstrated that proposed numerical targets for mercury inadequately consider mercury speciation. Assessment report was used in contention of source

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allocations.

- **Semi-Permeable Membrane Devices Technical Review**, Alaska — Provided senior review of the ability of Semi-Permeable Membrane Devices (to predict time-weighted average hydrocarbon concentrations in water and receptor tissues. Evaluated existing field and laboratory studies. Provided summary report on method effectiveness and limitations.
- **Groundwater Use Investigation**, California — Evaluated clogging issues associated with groundwater extraction and irrigation. Results of this project were used in insurance claim.
- **Groundwater Remediation Performance Assessment**, California — Assessed the performance of groundwater remediation activities at a petroleum-impacted site as part of a cost recovery lawsuit.

### URS Corporation, Portland, Oregon / Oakland, California

- **San Francisco International Airport Runway Reconfiguration Study (SFO/FAA)**, California — Managed geochemical modeling activities for a study of the effects of dredging and disposal in San Francisco Bay. Calibrated and verified numerical biogeochemical reactive transport models for copper, mercury, nickel, PAHs, and PCBs in San Francisco Bay. Presented and defended findings to panel of government and academic experts assembled by the National Oceanic and Atmospheric Administration (NOAA). Wrote technical reports in support of anticipated NEPA/CEQA requirements and published results.
- **San Luis Drain Alternatives Evaluation Project, Bureau of Reclamation**, Sacramento, California — Managed MIKE 21 modeling tasks for this project. Developed reactive transport models to predict changes in salinity at water treatment plant intakes and selenium bioaccumulation in ecological receptors. Work was performed for NEPA/CEQA certification.
- **Contaminated Upland Marsh Mercury Study, UC Berkeley, Richmond Field Station**, California — Managed mercury bench-scale treatability study for remediation of a contaminated upland marsh. Evaluated *in situ* treatment alternatives for remediating mercury-contaminated groundwater using site geochemistry, laboratory treatability tests, and reactive transport model predictions. Final remediation based on study results. Results published in peer-reviewed scientific literature.
- **Bulk Fuel Terminal Natural Attenuation Study**, Portland, Oregon — Supervised this natural attenuation study. Developed site sampling and analysis plans to assess the geochemistry and current nature and extent of contamination. Developed a reactive transport model that included hydrocarbon degradation, redox reactions, and arsenic transport. Used model predictions to support results and recommendations for the site RI/FS.
- **San Francisco Bay Metals Contamination**, Martinez, California — Modeled potential groundwater and surface-water contamination resulting from exposed cinder piles in a marsh. Assessed the effectiveness of engineered and natural barriers to protect surface water and groundwater from discharges of copper, zinc, and acid. Results of groundwater/surface-water reactive transport models were used by the client to justify appropriate cleanup levels and remedial design to the lead regulatory agency.
- **Sediment Remediation Evaluation**, California — Performed water-quality modeling of inorganic and organic contaminants associated with dredging and disposal of contaminated sediments in San Francisco Bay. Developed custom chemical software, and compared predictions to water quality objectives as part of a sediment remediation effort.
- **Nitrate Impacts in Groundwater Evaluation**, Washington — Performed a groundwater quality evaluation as part of a waste discharge permit renewal application. Assessed potential impacts associated with the use of treated wastewater for irrigation.

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- **Landfill Permit Groundwater Evaluation**, Oregon — Performed groundwater monitoring and statistical analysis of water-quality data for landfill permitting.
- **Quarry Operations Water-Quality Evaluation**, California — Evaluated water-quality data to determine potential impacts of quarry operations on surface water.

### University of California at Berkeley, California

- **Metal/Metalloid Transport in Groundwater**, California/Nevada — Conducted scientific research on the geochemistry of arsenic, antimony, mercury, gold, and silver. Evaluated laboratory experiments, compiled thermodynamic databases, and developed software for statistically evaluating speciation and mobility at ambient and elevated temperatures and pressures. Results published in reports prepared for Lawrence Berkeley National Laboratory.
- **Yucca Mountain Nuclear Waste Repository**, Nevada — Served as a geologic consultant to the Mineral and Nuclear Engineering Department faculty at the University of California at Berkeley. Assessed potential migration of radionuclides in the proposed nuclear waste repository. Analysis published in a peer-reviewed scientific journal.

### PUBLICATIONS & PRESENTATIONS

- Bessinger, B., V. Bedekar, M. Tonkin, J. Szecsody, N. Qafoku, and M. Truex, 2015. Simulation of Co-Precipitated Chromate-Calcite at a Waste Site. Presentation at MODFLOW and More 2015: Modeling a Complex World, Golden, CO, May 31-June 3, 2015.
- Bessinger, B., and C. Neville, 2015. Solute Transport Modeling: Ideal and Otherwise. Presentation of Short Course at the 10<sup>th</sup> Washington Hydrogeology Symposium, Tacoma, WA, April 14-16, 2015.
- Bessinger, B.A., 2014. The Use of Stable Isotopes to Identify Sources of Mercury in Sediment: A Review and Uncertainty Analysis. *Environmental Forensics*, v. 15, pp. 265-280.
- Bessinger, B.A., D. Vlassopoulos, S. Serrano, and P.A. O'Day, 2012. Reactive Transport Modeling of Subaqueous Sediment Caps and Implications for the Long-Term Fate of Arsenic, Mercury, and Methylmercury. *Aquatic Geochemistry*, v. 18, pp. 297-326.
- Bessinger, B.A., 2012. Application of Stable Isotopes to Identify Sources of Mercury in the Environment. Presentation at the 52<sup>nd</sup> Annual PNWIS/A&WMA Conference, Portland, OR, November 7-9, 2012.
- Bessinger, B., and R. Hennem, 2012. The Effect of Mineralogical Speciation on Arsenic and Boron Mobility in Phosphatic Wastes. Presentation at 22<sup>nd</sup> Annual International Conference on Soil, Water, Energy, and Air. San Diego, CA, March 19-22, 2012.
- Bessinger, B., and D. Vlassopoulos, 2011. A Reactive Transport Model of Mercury Fate in Sediment. Presentation at the 8<sup>th</sup> Washington Hydrogeology Symposium, Tacoma, WA, April 26-28, 2011.
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- Bessinger, B., and C. Marks, 2010. Treatment of Mercury-Contaminated Soils with Activated Carbon: A Laboratory, Field, and Modeling Study. *Remediation Journal*, v. 21, no. 1, pp. 115-135.

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- Bessinger, B., D. Vlassopoulos, S. Serrano, and P. O'Day, 2010. Reactive Transport Modeling of Arsenic and Mercury Fate at the Ground Water-Surface Water Interface. Presentation at the 2010 Ground Water Summit, Denver, CO, April 11-15, 2010.
- Vlassopoulos, D., B. Bessinger, and P. O'Day, 2010. Aqueous solubility of  $As_2S_3$  and thermodynamic stability of thioarsenites. in *Proceedings of the Thirteenth International Symposium on Water Rock Interaction*. Guanajuato, Mexico, August 16-20, 2010.
- Bessinger, B., D. Vlassopoulos, S. Serrano, and P. O'Day, 2009. Reactive Transport Modeling of Arsenic and Mercury in a Chemically Amended Sediment Cap. in *Proceedings of the Fifth International Conference on Remediation of Contaminated Sediments*, Jacksonville, FL, February 2-5, 2009.
- Bessinger, B., and D. Vlassopoulos, 2009. A Geochemical Reactive Transport Model of Arsenic and Trihalomethanes in Aquifer Storage & Recovery Systems. Presentation at the 7<sup>th</sup> Washington Hydrogeology Symposium, Tacoma, WA, April 27-30, 2009.
- Vlassopoulos, D., B. Bessinger, V. Illera, and P. O'Day, 2009. Lithologic, Hydrologic and Biogeochemical Influences on Spatio-Temporal Variability of As and Hg Concentrations in Groundwater. Presentation at Goldschmidt 2009, Davos, Switzerland, June 21-26, 2009.
- O'Day, P., S. Serrano, B. Bessinger, V. Illera, and D. Vlassopoulos, 2009. Sediment Remediation of Metal and Metalloid Contaminants with Reactive Amendments. Presentation at Goldschmidt 2009, Davos, Switzerland, June 21-26, 2009.
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- Bigham, G., B. Henry, and B. Bessinger, 2005. Mercury—A Tale of Two Toxins. *Natural Resources & Environment*, v. 19, no. 4. in ABA's Section of Environment, Energy, and Resources' Issue on Highly Regulated Chemicals, pp. 26-30.
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### DEPOSITION AND TESTIMONY EXPERIENCE

#### DEPOSITION

- 2010 Sublette County v. Wyoming Department of Environmental Quality. Case No. 09-5601. January 20, 2010.

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## **Appendix C**

### **2018-2019 Fee Schedule**

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SCHEDULE OF FEES AND EXPENSES FOR CONSULTING SERVICES  
FY 2019

**CONSULTING FEES:**

**Professional Services**

Senior Principal	\$330.00 per hour
Principal	\$291.00 per hour
Senior Associate	\$229.00 per hour
Associate	\$209.00 per hour
Senior Hydrogeologist/Scientist	\$182.00 per hour
Senior Project Hydrogeologist/Scientist/Engineer	\$168.00 per hour
Project Hydrogeologist/Scientist/Engineer	\$159.00 per hour
Senior Staff Hydrogeologist/Scientist	\$143.00 per hour
Staff Hydrogeologist/Scientist	\$121.00 per hour
Technician/Draftsperson	\$ 93.00 per hour
Support Personnel	\$ 84.00 per hour

**Routine Field Services**

Field Supervisor	\$159.00 per hour
Field Hydrogeologist/Scientist	\$121.00 per hour
Field Technician	\$ 84.00 per hour

**TRAVEL EXPENSES:** 1.15 x actual cost

**OTHER DIRECT EXPENSES:** 1.15 x actual cost

**CHARGES FOR OFFICE EQUIPMENT USE:**

Specialized Computing	\$ 20.00 per hour
Copying	\$ 0.12 per page
Telecopying	\$ 0.50 per page

**CHARGES FOR FIELD EQUIPMENT USE:**

For projects involving field work, a schedule of rental rates for field equipment will be provided upon request.

Statements for consulting services issued every four weeks for payment within 30 days of statement date. Past-due accounts are subject to a finance charge of 1% per month on the unpaid balance.

This fee schedule will remain in effect until April 2019 at which time it will be adjusted based upon review of the Consumer Price and Employment Cost indices.